Capital and risk management

Presentation of information

Where indicated in the section headers, information in the Capital and risk management section (pages 89 to 164) is within the scope of the Independent auditor's report. Where a main section header, presented in bold, is marked as audited all sub sections are also audited.

Risk management framework

Introduction

RBS operates an integrated risk management framework, centred around the embedding of a strong risk culture, which is designed to achieve compliance with prudential and conduct obligations. Each element of the risk management framework functions both individually and as part of a larger continuum. The framework ensures the tools and capability are in place to facilitate risk management and decision-making across the organisation.

RBS's strategy is informed and shaped by an understanding of the risk landscape, including a range of significant risks and uncertainties in the external economic, political and regulatory environment. Identifying these risks and understanding how they affect RBS informs risk appetite and risk management practice.

Risk appetite, which is supported by a robust set of principles, policies and practices, defines our levels of tolerance for a variety of risks. It is a key element of RBS's risk management framework and culture, providing a structured approach to risk-taking within agreed boundaries.

Effective governance, underpinned by the three lines of defence model, is essential to ensure the right decisions are being made by the right people at the right time. Governance includes regular and transparent risk reporting as well as discussion and decision-making at senior management committees, which informs management strategies across the organisation.

RBS aims to have the right tools in place to support effective risk management. Having the appropriate capability, people and infrastructure is central. This is supported by a strong emphasis on systems, training and development to ensure threats are anticipated and managed appropriately within the boundaries determined by the agreed risk appetite.

Measurement, evaluation and transparency are also fundamental elements of the framework, providing robust analysis of the materiality and likelihood of specific threats as well as supporting understanding and communication of the financial and non-financial risks to which RBS is exposed.

RBS has a strong focus on defining the control environment to ensure the effective operation of policies and processes embedded in the customer-facing businesses, thus facilitating the management of the risks they take in the course of their day-to-day activities.

RBS also has a strong focus on continually improving the way risk is managed, particularly in terms of how threats are anticipated or responded to, but also in terms of simplifying or enhancing existing controls, policies and practice.

Essential to this is the ability to scan both the medium and long-term horizon for risks. Stress testing is used to quantify, evaluate and understand the potential impact that changes to risks may have on the financial strength of RBS, including its capital position. In turn, the results of stress tests can be used to inform and shape strategy.

Given the evolving landscape, including the structural reform required by the UK's ring-fencing requirements, in 2018 there was an emphasis on enhancing both the risk culture and risk appetite elements of the framework – as well as the interconnectivity between framework components.

Risk management framework continued

All RBS employees share ownership of the way risk is managed. The businesses, the control and support functions, and Internal Audit work together to make sure business activities and policies are consistent with risk appetite; following the three lines of defence model. RBS constantly monitors its risk profile against its defined risk appetite and limits, taking action when required to balance risk and return.

The methodology for setting, governing and embedding risk appetite across RBS is being further enhanced with the aim of simplifying current risk appetite processes and increasing alignment with strategic planning and external threat assessments.

Risk culture

A strong risk culture is essential if RBS is to achieve its ambition to build a truly customer-focused bank. RBS's risk culture target is to make risk simply part of the way that employees work and think.

Such a culture must be built on strong risk practices and appropriate risk behaviours must be embedded throughout the organisation.

To achieve this, RBS is focusing on leaders as role models and taking action to build clarity, continuing to develop capability and motivate employees to reach the required standards of risk culture behaviour. This includes: taking personal responsibility for understanding and proactively managing the risks associated with individual roles; respecting risk management and the part it plays in daily work; understanding clearly the risks associated with individual roles; aligning decision-making to RBS's risk appetite; considering risk in all actions and decisions; escalating risks and issues early; taking action to mitigate risks; learning from mistakes and near-misses; challenging others' attitudes, ideas and actions; and reporting and communicating risks transparently.

RBS's target risk culture behaviours are embedded in Our Standards and are clearly aligned to the core values of "serving customers", "working together", "doing the right thing" and "thinking long-term". These act as an effective basis for a strong risk culture because Our Standards are used for performance management, recruitment and development.

A risk culture measurement and reporting approach has been developed, enabling RBS to benchmark both internally and externally. This allows RBS to assess progress in embedding its target risk culture where risk is simply part of the way staff work and think.

Training

Enabling employees to have the capabilities and confidence to manage risk is core to RBS's learning strategy.

RBS offers a wide range of risk learning, both technical and behavioural, across the risk disciplines. This training can be mandatory, role-specific or for personal development.

Code of Conduct

Aligned to RBS's values is the Code of Conduct. The code provides guidance on expected behaviour and sets out the standards of conduct that support the values. It explains the effect of decisions that are taken and describes the principles that must be followed.

These principles cover conduct-related issues as well as wider business activities. They focus on desired outcomes, with practical guidelines to align the values with commercial strategy and actions. The embedding of these principles facilitates sound decision-making and a clear focus on good customer outcomes.

A simple decision-making guide – the "YES check" – has been included in the Code of Conduct. It is a simple set of five questions, designed to ensure RBS values guide day-to-day decisions:

- Does what I am doing keep our customers and RBS safe and secure?
- Would customers and colleagues say I am acting with integrity?
- Am I happy with how this would be perceived on the outside?
- Is what I am doing meeting the standards of conduct required?
- In five years' time would others see this as a good way to work?

Each of the five questions is a prompt to think about how the situation fits with RBS Group's values. It ensures that employees can think through decisions that do not have a clear answer, and guides their judgements.

If conduct falls short of RBS's required standards, the accountability review process is used to assess how this should be reflected in pay outcomes for those individuals concerned. RBS-wide remuneration policy ensures that the remuneration arrangements for all employees reflect the principles and standards prescribed by the PRA rulebook and the FCA handbook. Any employee falling short of the expected standards would also be subject to internal disciplinary policies and procedures. If appropriate, the relevant authority would be notified.

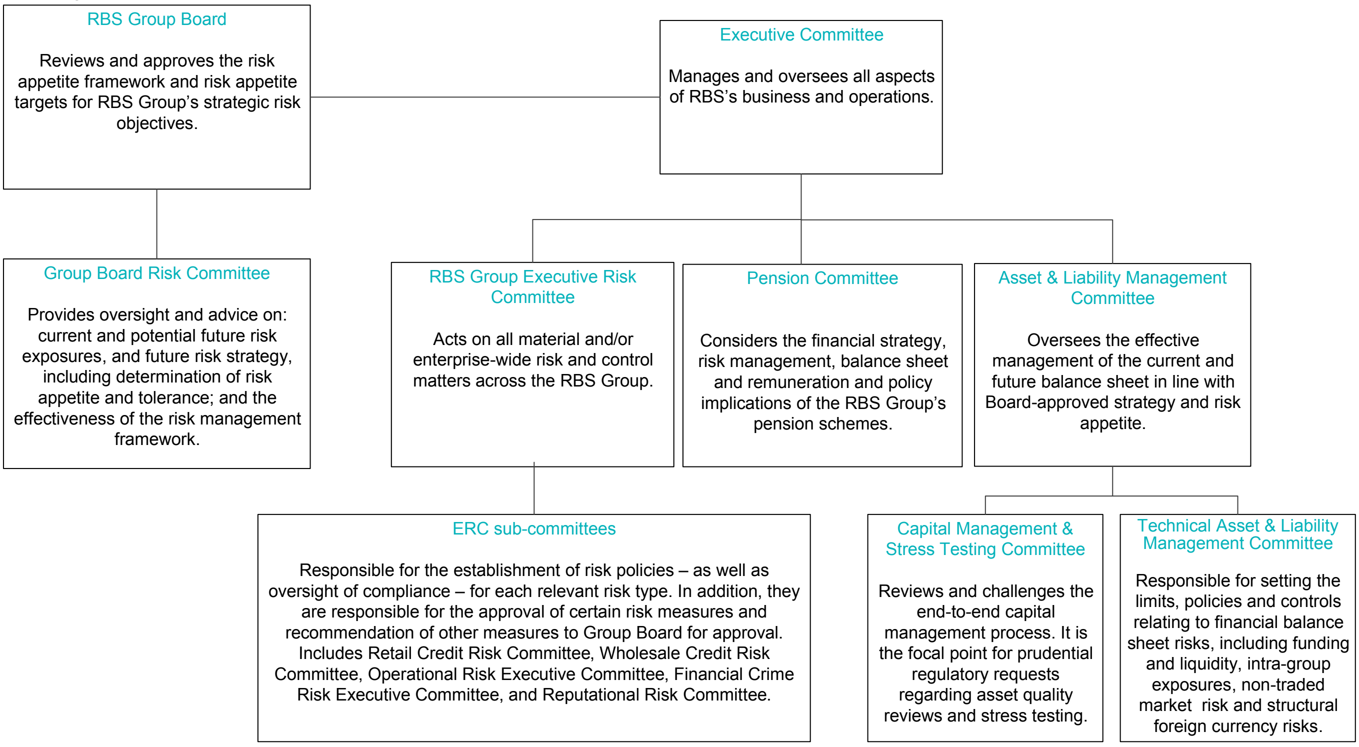
Capital and risk management

Risk management framework continued

Risk governance

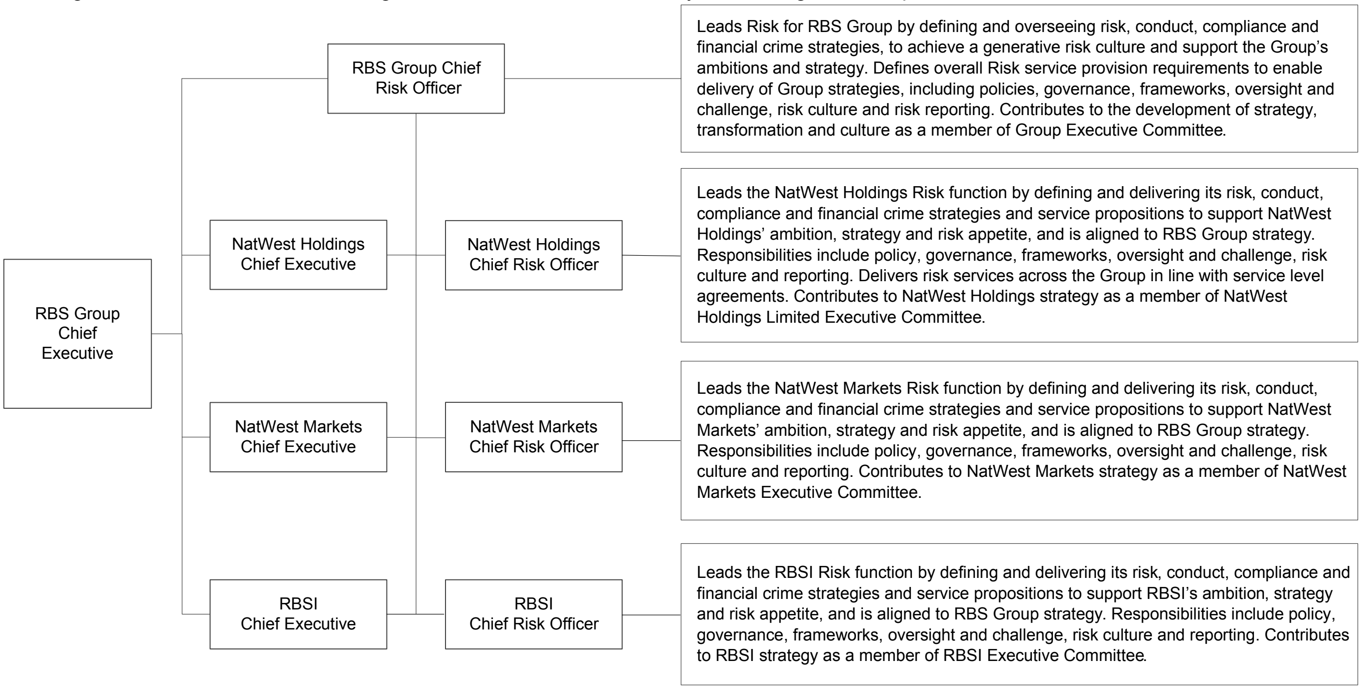
Committee structure

The diagram illustrates RBS's risk committee structure in 2018 and the main purposes of each committee.



Risk management structure

The diagram illustrates RBS's risk management structure in 2018 and key risk management responsibilities.



Notes:

(1) While separate roles, the individual undertaking the RBS Group Chief Executive role also performs the NatWest Holdings Chief Executive role.

(2) The RBS Group Risk function is led by the RBS Group Chief Risk Officer. The RBS Group Chief Risk Officer reports directly to the RBS Group Chief Executive and has a secondary reporting line to the chair of the Group Board Risk Committee as well as a right of access to the committee.

(3) The NatWest Holdings Chief Risk Officer (Chief Risk Officer, Ring-Fenced Bank) reports directly to the RBS Group Chief Risk Officer and the NatWest Holdings Chief Executive, along with a secondary reporting line to the NatWest Holdings Board Risk Committee chair and right of access to the committee including the Deputy Chairman.

(4) The NatWest Holdings Risk function provides risk management services across the RBS Group, including to the RBS Group Chief Risk Officer and – where agreed – to the NatWest Markets and RBSI Chief Risk Officers. These services are managed, as appropriate, through service level agreements.

(5) The NatWest Holdings Risk function is independent of the NatWest Holdings customer-facing franchises and support functions. It provides oversight of risk management ensuring that risk exposures arising from management and business activities are adequately monitored and controlled. The directors of Financial Risk & Analytics, Compliance & Conduct, Restructuring, Risk Policy & Frameworks and Operational Risk & Services as well as the Chief Financial Crime Officer, Chief Credit Officer, Deputy Chief Risk Officer and Head of Risk Strategy & Transformation report to the NatWest Holdings Chief Risk Officer. The Director of Risk, Ulster Bank Ireland DAC and the Director of Compliance, Ulster Bank Ireland DAC, report to the Ulster Bank Ireland DAC Chief Executive; they also have a reporting line to the NatWest Holdings Chief Risk Officer.

(6) The Chief Risk Officers for NatWest Markets and RBSI have dual reporting lines into the RBS Group Chief Risk Officer and the respective chief executives of their entities. There are additional reporting lines to the NatWest Markets and RBSI Board Risk Committee chairs and a right of access to the committee.

Risk management framework continued

Three lines of defence

RBS uses the three lines of defence model to articulate accountabilities and responsibilities for managing risk across the organisation. The three lines of defence model is adopted across the industry to support the embedding of effective risk management and is expressed through a set of principles as outlined below. All roles, regardless of level, sit within one of these three lines.

First line of defence – Management and supervision

The first line of defence encompasses most roles within RBS, including those in customer franchises, Technology and Services as well as support functions such as Human Resources, Communications & Marketing and Finance. Responsibilities include:

- Owning, managing and supervising, within a defined risk appetite, the risks which exist in business areas and support functions.
- Ensuring the business has effective mechanisms for identifying, reporting and managing risk and controls.
- Ensuring appropriate controls are in place to mitigate risk, balancing control, customer service and competitive advantage.
- Ensuring that the culture of the business supports balanced risk decisions and compliance with policy, laws and regulations.

Second line of defence – Oversight and control

The second line of defence is the Risk function as well as the policy and control elements of Human Resources, Legal and the Finance function. Responsibilities include:

- Leading the articulation, design and development of risk culture and appetite.
- Setting the standard for risk management across the Group.
- Overseeing and challenging the management of risks and controls.
- Analysing the aggregate risk profile and ensuring that risks are being managed within risk appetite.
- Providing expert advice to the first line on risk management, including the application of effective risk and control frameworks and the consideration of risk in decision-making.
- Providing senior executives with relevant management information and reports, and escalating concerns where appropriate.

Third line of defence – Internal Audit

Responsibilities include:

- Providing assurance to the Group Audit Committee on the appropriateness of the design and operational effectiveness of governance, risk management and internal controls to monitor and mitigate material risks.
- Engaging with management to provide perspectives, insights and challenge in order to influence the building of a sustainable bank.
- Providing independent assurance to the Financial Conduct Authority, Prudential Regulation Authority, Central Bank of Ireland and other key jurisdictional regulators on specific risks and controls.

Risk appetite

Risk appetite defines the level and types of risk RBS is willing to accept, within risk capacity, in order to achieve strategic objectives and business plans. It links the goals and priorities to risk management in a way that guides and empowers staff to serve customers well and achieve financial targets.

For certain strategic risks, risk capacity defines the maximum level of risk the RBS Group can assume before breaching constraints determined by regulatory capital and liquidity needs, the operational environment, and from a conduct perspective. Articulating risk capacity helps determine where risk appetite should be set, ensuring there is a buffer between internal risk appetite and the Group's ultimate capacity to absorb losses.

Risk appetite framework

The risk appetite framework bolsters effective risk management by promoting sound risk-taking through a structured approach, within agreed boundaries. It also ensures emerging risks and risk-taking activities that would be out of appetite are identified, assessed, escalated and addressed in a timely manner.

To facilitate this, a detailed annual review of the framework is carried out. The review includes:

- Assessing the adequacy of the framework when compared to internal and external expectations.
- Ensuring the framework remains effective as a strong control environment for risk appetite.
- Assessing the level of embedding of risk appetite across the organisation.

The Board approves the risk appetite framework annually.

Establishing risk appetite

Risk appetite is communicated across RBS through risk appetite statements. The risk appetite statements provide clarity on the scale and type of activities that can be undertaken in a manner that is easily conveyed to staff.

Risk appetite statements consist of qualitative statements of appetite supported by risk limits and triggers that operate as a defence against excessive risk-taking. They are established at RBS-wide level for all strategic risks and material risks, and at legal entity, franchise, and function level for all other risks.

The annual process of establishing risk appetite statements is completed alongside the business and financial planning process. This ensures plans and risk appetite are appropriately aligned.

The Board sets risk appetite for the most material risks to help ensure RBS is well placed to meet its priorities and long-term targets even under challenging economic environments. It is the basis on which RBS remains safe and sound while implementing its strategic business objectives.

RBS's risk profile is frequently reviewed and monitored to ensure it remains within appetite and that management focus is concentrated on all strategic risks, material risks and emerging risk issues. Risk profile relative to risk appetite is reported regularly to the Board and senior management.

Risk controls and limits

Risk controls and their associated limits are an integral part of the risk appetite approach and a key part of embedding risk appetite in day-to-day risk management decisions. A clear tolerance for material risk types is set in alignment with business activities.

RBS policies directly support the qualitative aspects of risk appetite, helping to rebuild and maintain stakeholder confidence in RBS's risk control and governance. Its integrated approach is designed to ensure that appropriate controls, aligned to risk appetite, are set for each of the strategic and material risks it faces, with an effective assurance process put in place to monitor and report on performance.

Risk identification and measurement

Risk identification and measurement within the risk management process comprise:

- Regular assessment of the overall risk profile, incorporating market developments and trends, as well as external and internal factors.
- Monitoring of the risks associated with lending and credit exposures.
- Assessment of trading and non-trading portfolios.
- Review of potential risks in new business activities and processes.
- Analysis of potential risks in any complex and unusual business transactions.

The financial and non-financial risks that RBS faces each day are detailed in the Risk Directory. This provides a common risk language to ensure consistent terminology is used across RBS. The Risk Directory is subject to annual review. This ensures that it continues to provide a comprehensive and meaningful list of the inherent risks within the businesses.

Risk treatment and mitigation

Risk treatment and mitigation is an important aspect of ensuring that risk profile remains within risk appetite. Risk mitigation strategies are discussed and agreed with the businesses. When evaluating possible strategies, costs and benefits, residual risks (risks that are retained) and secondary risks (those caused by the risk mitigation actions) are considered. Monitoring and review processes are in place to track results. Early identification and effective management of changes in legislation and regulation are critical to the successful mitigation of conduct risk. The effects of all changes are managed to ensure timely compliance readiness. Changes assessed as having a high or medium-high impact are managed closely.

Risk management framework continued

Significant and emerging risks that may affect future results and performance are reviewed and monitored. Action is taken to mitigate potential risks as and when required. In depth analysis is carried out, including the stress testing of exposures relative to the risk.

Risk assurance

Assurance is carried out on targeted credit risk, market risk, compliance and conduct risk and financial crime risk activities to provide assurance to both internal and external stakeholders including the Board, senior management, the customer-facing franchises, Internal Audit and the Group's regulators. Selected key controls are also reviewed. Qualitative reviews are carried out to assess various risk aspects as appropriate, including: the quality of risk portfolios, the accuracy of the Basel model inputs and related probability of default/loss given default classifications, the quality of risk management practices, policy compliance and adherence to risk appetite. This can include testing the Group's credit portfolios and market risk exposures to assist in the early identification of emerging risks, as well as undertaking targeted reviews to examine specific issues.

The adequacy and effectiveness of selected key controls owned and operated by the second line of defence are also tested (with a particular focus on credit risk and market risk controls). Selected controls within the scope of Section 404 of the US Sarbanes-Oxley Act 2002 as well as selected controls supporting risk data aggregation and reporting are also reviewed. Assurance is carried out on Anti-Money Laundering, Sanctions, and Anti-Bribery & Corruption processes and controls. This helps inform whether or not the financial crime control environment is adequate and effective and whether financial crime risk is appropriately identified, managed and mitigated. The Risk Assurance Committee ensures a consistent and fair approach to all aspects of the second-line assurance review activities. The committee also monitors and validates the ongoing programme of reviews and tracks the remediation of the more material review actions.

Model risk

Model risk is the risk that a model is specified incorrectly (not achieving the objective for which it is designed), implemented incorrectly (an error in translating the model specification into the version actually used), or being used incorrectly (correctly specified but applied inappropriately).

RBS uses a variety of models as part of its risk management process and activities. Key examples include the use of model outputs to support risk assessments in the credit approval process, ongoing credit risk management, monitoring and reporting, as well as the calculation of risk-weighted assets. Other examples include the use of models to measure market risk exposures and calculate associated capital requirements, as well as for the valuation of positions. The models used for stress-testing purposes also play a key role in ensuring RBS holds sufficient capital, even in stressed market scenarios.

Key developments in 2018

In April 2018, the PRA set out its expectations on the model risk management practices that should be adopted when using stress test models. RBS has a strong focus on model risk management and, as a result, practices were reviewed and, where appropriate, work to enhance them in line with regulatory expectations continues.

RBS further invested in model risk management during 2018, particularly given business demand and the growing complexity of requirements, such as new regulation and AI. This included the specification of additional IT systems to enhance capability in this area.

Model Risk Governance

Model Risk Governance is responsible for setting policy and providing a governance framework for all of RBS's models and related processes. It is also responsible for defining and monitoring model risk appetite in conjunction with model owners and model users, monitoring the model risk profile and reporting on the model population as well as escalating issues to senior management, through the Model Risk Forum, and the respective franchise and function risk committees.

Model Risk Management

Model Risk Management performs independent model validation for material models. It works with individual businesses and functions to monitor adherence to model risk standards, ensuring that models are developed and implemented appropriately and that their operational environment is fit for purpose.

Model Risk Management performs reviews of relevant risk and pricing models in two instances: (i) for new models or amendments to existing models and (ii) as part of its ongoing programme to assess the performance of these models. Model Risk Management reviews may test and challenge the logic and conceptual soundness of the methodology, or the assumptions underlying a model. Reviews may also test whether or not all appropriate risks have been sufficiently captured as well as checking the accuracy and robustness of calculations. Based on the review and findings from Model Risk Management, RBS's model or risk committees consider whether a model can be approved for use. Models used for regulatory reporting may additionally require regulatory approval before implementation.

Model Risk Management reassesses the appropriateness of approved risk models on a periodic basis. Each periodic review begins with an initial assessment. Based on the initial assessment, an internal model governance committee will decide to re-ratify a model or to carry out additional work. In the initial assessment, Model Risk Management assesses factors such as a change in the size or composition of the portfolio, market changes, the performance of – or any amendments to – the model and the status of any outstanding issues or scheduled activities carried over from previous reviews. Model Risk Management also monitors the performance of RBS's portfolio of models to ensure they appropriately capture underlying business rationale. For more information relating to market risk models and pricing models, refer to page 159.

Stress testing

Stress testing – capital management

Stress testing is a key risk management tool and a fundamental component of RBS's approach to capital management. It is used to quantify, evaluate and understand the potential impact of specified changes to risk factors on the financial strength of RBS, including its capital position. Stress testing includes:

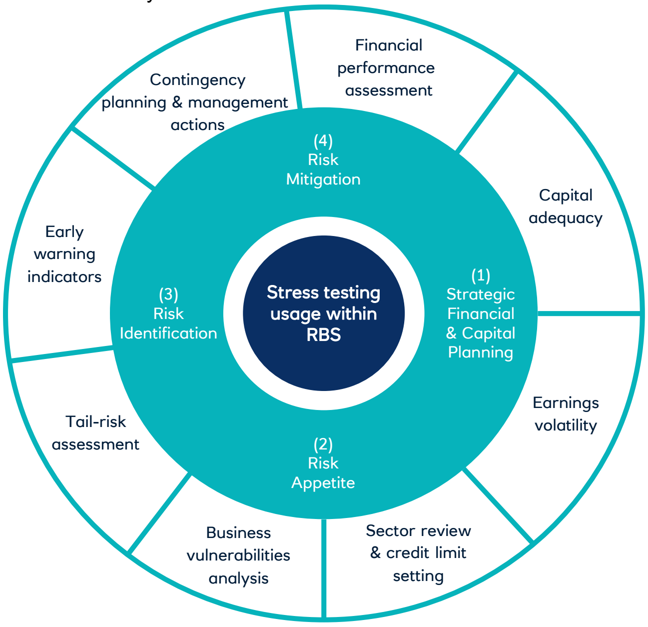
- Scenario testing, which examines the impact of a hypothetical future state to define changes in risk factors.
- Sensitivity testing, which examines the impact of an incremental change to one or more risk factors.

The process for stress testing consists of four broad stages:

Define scenarios	• Identify RBS-specific vulnerabilities and risks. • Define and calibrate scenarios to examine risks and vulnerabilities. • Formal governance process to agree scenarios.
Assess impact	• Translate scenarios into risk drivers. • Assess impact to positions, income and costs. • Impact assessment captures input from across RBS.
Calculate results and assess implications	• Aggregate impacts into overall results. • Results form part of risk management process. • Scenario results are used to inform RBS's business and capital plans.
Develop and agree management actions	• Scenario results are analysed by subject matter experts and appropriate management actions are then developed. • Scenario results and management actions are reviewed and agreed by senior management through executive committees including Executive Risk Committee, Board Risk Committee and the Board.

Risk management framework continued

Stress testing is used widely across RBS. The diagram below summarises key areas of focus:



Specific areas that involve capital management include:

- *Strategic financial and capital planning* – through assessing the impact of sensitivities and scenarios on the capital plan and capital ratios.
- *Risk appetite* – through gaining a better understanding of the drivers of – and the underlying risks associated with – risk appetite.
- *Risk identification* – through a better understanding of the risks that could potentially impact RBS's financial strength and capital position.
- *Risk mitigation* – through identifying actions that can be taken to mitigate risks, or could be taken, in the event of adverse changes to the business or economic environment. Risk mitigation is substantially supplemented through RBS's recovery plan.

Reverse stress testing is also carried out. This examines circumstances that can lead to specific, defined outcomes such as business failure. Reverse stress testing allows RBS to examine potential vulnerabilities in its business model more fully.

Capital sufficiency – going-concern forward-looking view

With a view to ensuring that RBS and its operating subsidiaries maintain sufficient CET1 capital, going-concern capital requirements are assessed on a forward-looking basis – including as part of the annual budgeting process. These assessments consider the resilience of capital adequacy and leverage ratios under a range of hypothetical future states. The assessments incorporate assumptions regarding a range of regulatory and accounting aspects such as IFRS 9, taking account of a number of factors including economic variables and impairments.

In particular, assessments of capital requirements rely on forecasts of:

- Future business performance given expectations of economic and market conditions over the forecast period.
- Future business performance under adverse economic and market conditions over the forecast period. A range of scenarios of different severity may be examined.

The examination of capital requirements under normal economic and market conditions enables RBS to demonstrate how its projected business performance allows it to meet all internal and regulatory capital requirements as they arise over the plan horizon. For example, RBS will assess its ability to issue loss-absorbing debt instruments in sufficient quantity to meet regulatory timelines. The cost of issuance will be factored into business performance metrics.

The examination of capital requirements under adverse economic and market conditions is assessed through stress testing.

The results of stress tests are not only used widely across RBS but also by the regulators to set specific capital buffers. RBS takes part in a number of stress tests run by regulatory authorities to test industry-wide vulnerabilities under crystallising global and domestic systemic risks. In 2018, RBS took part in the Bank of England and European Banking Authority stress tests. Details are set out on page 93.

Under stress testing, IFRS 9 volatility can have a more material impact. This is because the peak-to-trough change in CET1 may be affected by the transitions from Stage 1 to Stage 2 in stress conditions. RBS uses stress and the peak-to-trough movements to help assess the amount of CET1 capital it needs to hold in stress conditions, in accordance with the capital risk appetite framework.

Internal assessment of capital adequacy

An internal assessment of material risks is carried out annually to enable an evaluation of the amount, type and distribution of capital required to cover these risks. This is referred to as the Internal Capital Adequacy Assessment Process (ICAAP). The ICAAP consists of a point-in-time assessment of RBS's exposures and risks at the end of the financial year together with a forward-looking stress capital assessment. The ICAAP is approved by the Board and submitted to the PRA.

The ICAAP is used to form a view of capital adequacy separately to the minimum regulatory requirements. The ICAAP is used by the PRA to make an assessment of RBS-specific capital requirements through the Pillar 2 framework.

Capital allocation

RBS has mechanisms to allocate capital across its legal entities and businesses which aim to optimise the utilisation of capital resources taking into account applicable regulatory requirements, strategic and business objectives and risk appetite. The framework for allocating capital is approved by the Asset & Liability Management Committee.

Governance

Capital management is subject to substantial review and governance. Formal approval of capital management policies is either by the Asset & Liability Management Committee or by the Board on the recommendation of the Board Risk Committee.

The Board approves the capital plans, including those for key legal entities and businesses as well as the results of the stress tests relating to those capital plans.

Stress testing – liquidity

Liquidity risk monitoring and contingency planning

In implementing the liquidity risk management framework, a suite of tools is used to monitor, limit and stress test the risks on the balance sheet. Limit frameworks are in place to control the level of liquidity risk, asset and liability mismatches and funding concentrations.

Liquidity risks are reviewed at significant legal entity and business levels daily, with performance reported to the Asset & Liability Management Committee at least monthly. Liquidity Condition Indicators are monitored daily which ensures any build-up of stress is detected early and the response escalated appropriately through recovery planning.

Internal assessment of liquidity

Under the liquidity risk management framework, RBS undertakes the Individual Liquidity Adequacy Assessment Process. This includes assessment of net stressed liquidity outflows. RBS considers a range of extreme but plausible stress scenarios on its liquidity position over various time horizons, as outlined below.

Capital and risk management

Risk management framework continued

Type	Description
Idiosyncratic scenario	The market perceives RBS to be suffering from a severe stress event, which results in an immediate assumption of increased credit risk or concerns over solvency.
Market-wide scenario	A market stress event affecting all participants in a market through contagion, counterparty failure and other market risks. RBS is affected under this scenario but no more severely than any other participants with equivalent exposure.
Combined scenario	This scenario models the combined impact of an idiosyncratic and market stress occurring at once. The combined scenario reflects the contingency that a severe name-specific event occurs at RBS in conjunction with a broader market stress, causing wider damage to the market and financial sector and severely affecting funding markets and assets.

RBS uses the most severe combination of these to set the internal stress testing scenario. The results of this enable RBS to set its internal liquidity risk appetite, which complements the regulatory liquidity coverage ratio requirement.

Stress testing – recovery and resolution planning

The RBS Group Recovery Plan explains how The Royal Bank of Scotland Group plc (RBSG) and its subsidiaries as a consolidated group would identify and respond to a financial stress event and restore its financial position to remain viable on an ongoing basis.

The Recovery Plan ensures that risks which could delay the implementation of a recovery strategy are highlighted and preparations are made to minimise the impact of these risks. Preparations RBS has taken include:

- developing a series of recovery indicators to provide early warning of potential stress events
- clarifying roles, responsibilities and escalation routes to minimise uncertainty or delay
- developing a recovery playbook to provide a concise description of the actions required during recovery
- detailing a range of options to address different stress conditions
- appointing dedicated option owners to reduce the risk of delay and bandwidth concerns

The Recovery Plan is intended to enable RBS to maintain critical services and products it provides to its customers (its critical economic functions), maintain its important business lines (core business lines) and operate within risk appetite whilst restoring the bank's financial condition.

The Recovery Plan is assessed for appropriateness on an ongoing basis and is updated annually, in line with regulatory requirements. It is reviewed and approved by the Board prior to submission to the PRA each year.

Individual Recovery Plans have been prepared for NatWest Holdings Limited, NatWest Markets Plc, RBS International Holdings Limited, Ulster Bank Ireland DAC and NatWest Markets N.V. These plans reflect the structure and operations of the post-ring-fenced group and detail the recovery options, recovery indicators and escalation routes for each entity to manage its own response to a financial stress.

If RBS was assessed by the UK authorities as failing or likely to fail the authorities have a wide range of powers to place RBS into Resolution. The UK's Special Resolution Regime places an obligation on banks to ensure they are resolvable. Resolvability is a measure of how effectively a set of actions could be taken to manage the failure of RBS, through execution of a preferred resolution strategy which the Group is Single Point of Entry Bail-in of the Group Hold Co. The process of resolution is owned and implemented by the Bank of England (as UK Resolution Authority).

RBS has a multi-year programme of work through to 1 January 2022 to ensure impediments to resolvability are removed and the regulatory resolution strategy could be executed.

Stress testing – market risk

Non-traded market risk

Non-traded exposures are reported to the PRA on a quarterly basis as part of the Stress Testing Data Framework. The return provides the regulator with an overview of RBS's banking book interest rate exposure, providing detailed product information analysed by interest rate driver and other characteristics – including accounting classification, currency and, counterparty type.

Scenario analysis based on hypothetical adverse scenarios is performed on non-traded exposures as part of the industry-wide Bank of England and European Banking Authority stress exercises. In addition, RBS produces its own internal scenario analysis as part of the financial planning cycles.

Non-traded market risk exposures which are not captured under Pillar 1 are capitalised through the ICAAP. The process covers the following risk types: gap risk, basis risk, credit spread risk, pipeline risk, structural foreign exchange risk, prepayment risk and accounting volatility risk. The ICAAP is completed with a combination of value and earnings measures. The total non-traded market risk capital requirement is determined by adding the different charges for each sub risk type. The ICAAP methodology captures at least ten years of historical volatility, produced with 99% confidence level. Methodologies are reviewed by RBS Model Risk and the results are approved by the Technical Asset & Liability Management Committee.

Traded market risk

RBS undertakes daily market risk stress testing to identify vulnerabilities and potential losses in excess of, or not captured in, value-at-risk. The calculated stresses measure the impact of changes in risk factors on the fair values of the trading and fair value through other comprehensive income portfolios.

RBS conducts historical, macroeconomic and vulnerability-based stress testing. Historical stress testing is a measure that is used for internal management. Using the historical simulation framework employed for value-at-risk, the current portfolio is stressed using historical data since 1 January 2005. This methodology simulates the impact of the 99.9 percentile loss that would be incurred by historical risk factor movements over the period, assuming variable holding periods specific to the risk factors and the businesses.

Historical stress tests form part of the market risk limit framework and their results are reported daily to senior management. Macroeconomic stress tests are carried out periodically as part of the bank-wide, cross-risk capital planning process. The scenario narratives are translated into risk factor shocks using historical events and insights by economists, risk managers and the first line.

Market risk stress results are combined with those for other risks into the capital plan presented to the Board. The cross-risk capital planning process is conducted once a year, with a planning horizon of five years. The scenario narratives cover both regulatory scenarios and macroeconomic scenarios identified by RBS.

Vulnerability-based stress testing begins with the analysis of a portfolio and expresses its key vulnerabilities in terms of plausible, vulnerability scenarios under which the portfolio would suffer material losses. These scenarios can be historical, macroeconomic or forward-looking/hypothetical. Vulnerability-based stress testing is used for internal management information and is not subject to limits. However, the results for relevant scenarios are reported to senior management

Risk management framework continued

Regulatory stress testing

In 2018, RBS took part in regulatory stress tests conducted by the Bank of England and the European Banking Authority. The scenarios are hypothetical in nature and do not represent forecasts of RBS's future business or profitability. The results of the regulatory stress tests are carefully assessed by RBS and form part of the wider risk management of RBS.

	Bank of England stress test	European Banking Authority stress test
Scenario	• Designed to assess the resilience of major UK banks to tail risk events. The severity of the test is related to policymakers' assessments of risk levels across markets and regions. • The 2018 stress test examined the impact, over five years, of deep simultaneous recessions in the UK and global economies, large falls in asset prices and a separate stress of misconduct costs. The economic scenario in the test was more severe than the global financial crisis.	• Designed to evaluate the impact, over three years, of a general macro financial downturn. • A static balance sheet assumption was made across the period of stress and therefore mitigating actions such as balance sheet reduction, business growth and cost savings are not factored into the stress outcomes.
Results	• On an IFRS 9 transitional basis, the CET1 ratio reached a low point of 9.6%, significantly above the hurdle rate of 7.3%. • On an IFRS 9 non-transitional basis, the CET1 ratio reached a low point of 9.2%, significantly above the hurdle rate of 6.9%. • On an IFRS 9 transitional basis, the Tier 1 leverage ratio low point was projected to be 5.1% under stress, significantly above the leverage ratio hurdle rate of 3.59%. • On an IFRS 9 non- transitional basis, the Tier 1 leverage ratio low-point was projected to be 4.8% under stress, significantly above the leverage ratio hurdle rate of 3.25%. • The stress was based on an end of 2017 balance sheet starting position. Since then, RBS has taken a number of actions to further improve its capital position stress resilience, including the continued reduction in certain credit portfolios and the resolution of various litigation cases and regulatory investigations.	• The 2018 EBA stress test did not contain a pass/fail threshold. • On an IFRS 9 transitional basis, RBS's CET1 ratio under the adverse scenario reached a low point of 9.9% • On an IFRS 9 non-transitional (fully loaded) basis, RBS's CET1 ratio under the adverse scenario reached a low point of 9.48% • On an IFRS 9 transitional basis, RBS's leverage ratio under the adverse scenario reached a low point of 4.83%. • On an IFRS 9 non-transitional (fully loaded) basis the leverage ratio under the adverse scenario reaches a low point of 4.1% • The stress was based on an end of 2017 balance sheet starting position. Since then, RBS has taken a number of actions to further improve its capital position stress resilience, including the continued reduction in certain credit portfolios and the resolution of various litigation cases and regulatory investigations.
What does this mean?	• The 2018 Bank of England and European Banking Authority stress test results demonstrated that good progress has been made in transforming the balance sheet to a safe and sustainable position.	

Capital and risk management

Capital, liquidity and funding risk

Definitions

Capital consists of reserves and instruments issued that are available, have a degree of permanency and are capable of absorbing losses. A number of strict conditions set by regulators must be satisfied to be eligible as capital.

Capital adequacy risk is the risk that there is or will be insufficient capital and other loss absorbing debt instruments to operate effectively including meeting minimum regulatory requirements, operating within Board approved risk appetite and supporting its strategic goals.

Liquidity consists of assets that can be readily converted to cash within a short timeframe at a reliable value. Liquidity risk is the risk of being unable to meet financial obligations as and when they fall due.

Funding consists of on-balance sheet liabilities that are used to provide cash to finance assets. Funding risk is the risk of not maintaining a diversified, stable and cost-effective funding base.

Liquidity and funding risks arise in a number of ways, including through the maturity transformation role that banks perform. The risks are dependent on factors such as:

- Maturity profile;
- Composition of sources and uses of funding;
- The quality and size of the liquidity portfolio;
- Wholesale market conditions; and
- Depositor and investor behaviour.

Sources of risk

Capital

The eligibility of instruments and financial resources as regulatory capital is laid down by applicable regulation. Capital is categorised under two tiers (Tier 1 and Tier 2) according to the ability to absorb losses, degree of permanency and the ranking of absorbing losses on either a going or gone concern basis. There are three broad categories of capital across these two tiers:

- CET1 capital. CET1 capital must be perpetual and capable of unrestricted and immediate use to cover risks or losses as soon as these occur. This includes ordinary shares issued and retained earnings.
- Additional Tier 1 (AT1) capital. This is the second type of loss absorbing capital and must be capable of absorbing losses on a going concern basis. These instruments are either written down or converted into CET1 capital when a pre-specified CET1 ratio is reached.
- Tier 2 capital. Tier 2 capital is the Group's supplementary capital and provides loss absorption on a gone concern basis. Tier 2 capital absorbs losses after Tier 1 capital. It typically consists of subordinated debt securities with a minimum maturity of five years.

Minimum requirement for own funds and eligible liabilities (MREL)

In addition to capital, other specific loss absorbing instruments, including senior notes issued by the Group, may be used to cover certain gone concern capital requirements which, in the EU, is referred to as MREL. Gone concern refers to the situation in which resources must be available to enable an orderly resolution, in the event that the Bank of England (BoE) deems that the Group has failed, or is likely to fail.

Liquidity

RBS maintains a prudent approach to the definition of liquidity resources. RBS manages its liquidity to ensure it is always available when and where required, taking into account regulatory, legal and other constraints. Following ring-fencing legislation, liquidity is no longer considered fungible across the Group and the liquidity portfolio has been restructured during 2018 to reflect this. Principal liquidity portfolios are maintained in the UK Domestic Liquidity Sub-Group (UK DoLSub) (primarily in NatWest Bank Plc), UBI DAC, NatWest Markets Plc, RBS International and NWM N.V.. Some disclosures in this section where relevant are presented, on a consolidated basis, for RBS, the UK DoLSub and on a solo basis for NatWest Markets plc.

Liquidity resources are divided into primary and secondary liquidity as follows:

- Primary liquid assets include cash and balances at central banks, Treasury bills and other high quality government and US agency bonds.
- Secondary liquid assets are eligible as collateral for local central bank liquidity facilities. These assets include own-issued securitisations or whole loans that are retained on balance sheet and pre-positioned with a central bank so that they may be converted into additional sources of liquidity at very short notice.

Funding

RBS maintains a diversified set of funding sources, including customer deposits, wholesale deposits and term debt issuance. RBS also retains access to central bank funding facilities.
For further details on capital constituents and the regulatory framework covering capital, liquidity and funding requirements, please refer to the RBS Pillar 3 Report 2018 on page 6. For MREL refer to page 8.

Key developments in 2018

- RBS continued to strengthen and de-risk its capital position; CET1 ratio remains ahead of the c14% target and increased by 30 basis points in the year to 16.2%. The directors have recommended a final dividend of 3.5p per ordinary share, and a further special dividend of 7.5p per ordinary share, which are both subject to shareholders' approval at the Annual General Meeting on 25 April 2019.
- IFRS 9 adoption on 1 January 2018 favourably impacted CET1 by 30 basis points. RWAs reduced by £12.2 billion to £188.7 billion primarily driven by the legacy business in NatWest Markets, the impact of capital initiatives in Commercial Banking and the impact of the non-performing loan sale and improvement in credit metrics in Ulster Bank RoI.
- CRR leverage ratio increased to 5.4% (2017 – 5.3%). UK leverage ratio improved to 6.2% (2017 – 6.1%) in line with the balance sheet reduction.
- During the year the BOE published indicative data on the minimum amount of loss-absorbing resources for the larger UK banks comprising MREL plus buffers. RBS is expected to require loss-absorbing resources of 22.9% of RWAs by 1 January 2020, rising to 26.5% by 1 January 2022. Total loss absorbing capital, based on RBS's interpretation of the rules and including the benefit of legacy securities, was 30.7% of RWAs at 31 December 2018.
- In 2018, RBSG plc issued approximately £7 billion MREL compliant senior debt bringing the total MREL senior debt issues to approximately £16 billion relative to the end state (1 January 2022) requirements of approximately £24 billion. These funds enabled RBSG plc to invest in £4.8 billion of NatWest Holdings MREL eligible issuance and £5.1 billion NWM plc eligible issuance in December 2018.
- During the year, RBS changed its approach to managing liquidity in preparation for ring-fencing. NatWest Markets left the UK DoLSub and now manages its liquidity on a stand-alone basis.
- The liquidity portfolio increased by £11 billion in 2018 to £198 billion, with primary liquidity increasing by £4 billion to £128 billion. The increase in primary liquidity is driven by increased customer surplus within NatWest Holdings, reduced funding requirement in NatWest Markets and net term issuance, partially offset by settlement of the payment to the US Department of Justice, contribution to the Group pension fund and Term Funding Scheme (TFS) repayment. Increase in secondary liquidity is driven primarily by repayment of TFS, resulting in the return of previously encumbered assets.
- The rise in primary liquidity resulted in higher liquidity coverage ratio (LCR) of 158% (2017 – 152%). The internal Stressed Outflow coverage ratio decreased to 154% (2017 – 168%) due to stress methodology changes and higher stressed behavioural outflows over the three month horizon.
- The net stable funding ratio is 141% (2017 – 139% on estimated comparable basis) above the minimum target of 100%.
- The regulatory agenda continues to rapidly evolve in the UK, Europe and internationally. RBS manages its capital, liquidity and funding to meet both current and future regulatory requirements whilst ensuring that we continue to serve customers well.

Capital, liquidity and funding risk continued

Capital management

Capital management ensures that there is sufficient capital and other loss absorbing instruments to operate effectively including meeting minimum regulatory requirements, operating within Board approved risk appetite, maintaining its credit rating and supporting its strategic goals.

Capital management is critical in supporting the businesses and is enacted through an end to end framework across businesses and the legal entities. Capital is managed both on a Group consolidated level, as well as at NatWest Holdings Group, NatWest Markets Plc, NatWest Markets NV, and RBS International levels. In addition, NatWest Holdings banking subsidiaries are also subject to the same principles, processes and management as the Group of which it is a part. Note that although the aforementioned entities are regulated in line with Basel III principles, local implementation of the framework differs across geographies.

Capital planning is integrated into the Group's wider annual budgeting process and is assessed and updated at least monthly. Regular returns are submitted to the PRA which include a two year rolling forward view. Other elements of capital management, including risk appetite and stress testing, are set out on pages 92 and 93.

Produce capital plans ↓	• Capital plans are produced for the Group, its key operating entities and its businesses over a five year planning horizon under expected and stress conditions. Stressed capital plans are produced to support internal stress testing in the ICAAP for regulatory purposes. • Shorter term forecasts are developed frequently in response to actual performance, changes in internal and external business environment and to manage risks and opportunities.
Assess capital adequacy ↓	• Capital plans are developed to maintain capital of sufficient quantity and quality to support the Group's business, its subsidiaries and strategic plans over the planning horizon within approved risk appetite, as determined via stress testing, and minimum regulatory requirements. • Capital resources and capital requirements are assessed across a defined planning horizon. • Impact assessment captures input from across the Group including from businesses.
Inform capital actions	• Capital planning informs potential capital actions including buy backs, redemptions, dividends and new issuance to external investors or via internal transactions. • Decisions on capital actions will be influenced by strategic and regulatory requirements, risk appetite, costs and prevailing market conditions. • As part of capital planning, RBS will monitor its portfolio of external capital securities and assess the optimal blend and most cost effective means of financing.

Capital planning is one of the tools that the Group uses to monitor and manage capital risk on a going and gone concern basis, including the risk of excessive leverage.

Liquidity risk management

RBS manages its liquidity risk taking into account regulatory, legal and other constraints to ensure sufficient liquidity is available where required to cover liquidity stresses. The principal levels at which liquidity risk is managed are:

- NatWest Holdings Group
- UK DoLSub
- UBI DAC
- NatWest Markets
- NatWest Markets Securities Inc.
- RBS International
- NWM N.V.

The UK DoLSub is PRA regulated and comprises RBS's four licensed deposit taking UK banks: National Westminster Bank Plc, The Royal Bank of Scotland plc, Coutts & Company and Ulster Bank Limited.

NatWest Markets Plc left the UK DoLSub during 2018 and now manages its own liquidity portfolio, as required by ring-fencing legislation.

RBS categorises its liquidity portfolio, including its locally managed liquidity portfolios, into primary and secondary liquid assets. The size of the liquidity portfolios are determined by referencing RBS's liquidity risk appetite. RBS retains a prudent approach to setting the composition of the liquidity portfolios, which is subject to internal policies applicable to all entities and limits over quality of counterparty, maturity mix and currency mix.

RBS International, NWM N.V. and UBI DAC hold locally managed portfolios that comply with local regulations that may differ from PRA rules.

The liquidity value of the portfolio is determined by taking current market prices and applying a discount or haircut, to give a liquidity value that represents the amount of cash that can be generated by the asset.

Funding risk management

RBS manages funding risk through a comprehensive framework which measures and monitors the funding risk on the balance sheet.

Asset and liability types broadly match. Customer deposits provide more funding than customer loans utilise; repurchase agreements are largely covered by reverse repurchase agreements; derivative assets are broadly netted against derivative liabilities.

Capital, liquidity and funding risk continued

Minimum requirements

Capital adequacy ratios

The Group is subject to minimum capital requirements relative to RWAs. The table below summarises the minimum ratios of capital to RWAs that the Group is expected to have to meet once CRR is fully implemented by 1 January 2019. These ratios apply at the consolidated group level. Different minimum capital requirements may apply to individual legal entities or sub-groups.

Minimum requirements	Type	CET1	Total Tier 1	Total capital
System wide	Pillar 1 minimum requirements	4.5%	6.0%	8.0%
	Capital conservation buffer	2.5%	2.5%	2.5%
	Countercyclical capital buffer (1)	0.7%	0.7%	0.7%
	G-SIB buffer (2)	1.0%	1.0%	1.0%
Bank specific	Pillar 2A(4)	2.0%	2.7%	3.6%
Total (excluding PRA buffer)(5)		10.7%	12.9%	15.8%

Notes:

(1) The countercyclical capital buffer (CCyB) applied to UK designated assets is set by the Financial Policy Committee (FPC). The UK CCyB is currently 1.0% (effective from November 2018). The rate had previously increased from 0.0% to 0.5% (effective June 2018). The Republic of Ireland CCyB is currently 0.0%, the CBI have announced an increase to 1.0% effective July 2019. Foreign exposures may be subject to different CCyB rates depending on the rate set in those jurisdictions. Firm specific CCyB is based on a weighted average at CCyB's applicable to countries in which the Bank has exposures.

(2) Globally systemically important banks (G-SIBs), as designated by the Financial Stability Board (FSB), are subject to an additional capital buffer of between 1% and 3.5%. In November 2018 the FSB announced that RBS is no longer a GSIB. From 1 January 2020, RBS will be released from this global buffer requirement.

(3) The Group will be subject to a systemic risk buffer (SRB) of between 0% and 3%. The SRB will apply from 1 January 2019 and will apply at the ring-fenced bank sub-group level rather than at the consolidated group level. The RFB SRB may require the Group to hold a minimum amount of capital at the consolidated group level beyond the levels set out in the table above.

(4) From 1 January 2015, UK banks have been required to meet at least 56% of its Pillar 2A capital requirement with CET1 capital and with balance with Additional Tier 1 and/or Tier 2 capital. Additional capital requirements under Pillar 2A may be specified by the PRA as a ratio or as an absolute value. The table sets out an implied ratio to cover the full value of Pillar 2A requirements. The PRA has recently determined that the Pillar 2A capital requirement for 2018 remains unchanged.

(5) The Group may be subject to a PRA buffer requirement as set by the PRA. The PRA buffer consists of two components:
- A risk management and governance buffer that is set as a scalar of the Pillar 1 and Pillar 2A requirements. The scalar could range between 10% and 40%.
- A buffer to cover stress risks informed by the results of the BoE concurrent stress testing results.
- The PRA requires that the level of this buffer is not publicly disclosed.

(6) The capital conservation buffer, the countercyclical capital buffer, the G-SIB buffer and systemic risk buffer (where applicable) make up the combined buffer. If the Group fails to meet the combined buffer requirement, it is subject to restrictions on distributions on CET1 instruments, discretionary coupons on AT1 instruments and on payment of variable remuneration or discretionary pension benefits. These restrictions are calculated by reference to the Group's Maximum Distributable Amount (MDA). Where a PRA buffer is applicable, the MDA trigger is below the PRA buffer and MDA restrictions are not automatically triggered if the Group fails to meet its PRA buffer. The MDA is calculated as the amount of interim or year-end profits not yet incorporated into CET1 capital multiplied by a factor ranging from 0 to 0.6 depending on the size of the CET1 shortfall against the combined buffer.

Leverage ratios

The table below summarises the minimum ratios of capital to leverage exposure under the PRA UK leverage framework that the Group must meet. In November 2016, the European Commission published a package of legislative proposals (CRR 2) for the adoption of a legally binding 3% of Tier 1 capital minimum leverage ratio with consideration of a leverage buffer ratio for G-SIBs once a final international agreement had been reached. Different minimum requirements may apply to individual legal entities or sub-groups.

Type	CET1	Total Tier 1
Minimum ratio	2.4375%	3.2500%
Countercyclical leverage ratio buffer (1)	0.2500%	0.2500%
Additional leverage ratio buffer	0.3500%	0.3500%
Total	3.0375%	3.8500%

Note:

(1) The countercyclical leverage ratio buffer is set at 35% of the Group's CCyB. As noted above the UK CCyB is currently 1.0% (effective from November 2018). The rate had previously increased from 0.0% to 0.5% (effective June 2018). Foreign exposures may be subject to different CCyB rates depending on the rate set in those jurisdictions. On 3 October 2017 the PRA, via revised policy statement (PS21/17), increased the Tier 1 leverage ratio requirement for UK banks by 25 basis points to 3.25% (CET1 requirement of 2.4375%). The PRA minimum leverage ratio requirement is supplemented with a G-SII additional leverage ratio buffer, currently 0.2625% under transitional arrangements (2017 – 0.175%) increasing to 0.35% from 1 January 2019.

Liquidity and funding ratios

The table below summarises the minimum requirements for key liquidity and funding metrics, under the relevant legislative framework.

Type	From 1 January 2018	From 1 January 2019
Liquidity coverage ratio (LCR)	100%	100%
Net stable funding ratio (NSFR) (1)	N/A	N/A

Note:

(1) In November 2016, the European Commission published its proposal for NSFR rules within the EU as part of its CRR2 package of regulatory reforms. CRR2 NSFR is expected to become the regulatory requirement in future within the EU and the UK. RBS has changed its policy on the NSFR to align with its interpretation of the CRR2 proposals with effect from 1 January 2018.

Capital, liquidity and funding risk continued

Measurement

Capital, risk-weighted assets and leverage: Key metrics

The table below sets out the key Capital and Leverage ratios.

	2018		2017	
Capital	End-point CRR basis (1) £bn	PRA transitional basis £bn	End-point CRR basis (1) £bn	PRA transitional basis £bn
CET1	30.6	30.6	32.0	32.0
Tier1	34.7	36.2	36.0	39.6
Total	41.2	44.2	42.8	47.9
RWAs				
Credit risk	137.9	137.9	144.7	144.7
Counterparty credit risk	13.6	13.6	15.4	15.4
Market risk	14.8	14.8	17.0	17.0
Operational risk	22.4	22.4	23.8	23.8
Total RWAs	188.7	188.7	200.9	200.9
Capital adequacy ratios	%	%	%	%
CET1	16.2	16.2	15.9	15.9
Tier 1	18.4	19.2	17.9	19.7
Total	21.8	23.4	21.3	23.9
Leverage ratios	2018		2017	
Tier 1 capital (£bn)	34.7	36.2	36.0	39.6
CRR leverage exposure (£bn)	644.5	644.5	679.1	679.1
CRR leverage ratio (%)	5.4%	5.6%	5.3%	5.8%
Average Tier 1 capital (£bn) (2)	35.7	37.9	36.4	40.0
Average leverage exposure (£bn) (2)	665.2	665.2	692.5	692.5
Average leverage ratio (%) (2)	5.4%	5.7%	5.3%	5.8%
UK leverage ratio	6.2%	6.5%	6.1%	6.7%

Notes:
(1) CRR as implemented by the Prudential Regulation Authority in the UK, with effect from 1 January 2014. All regulatory adjustments and deductions to CET1 have been applied in full for both bases.
(2) Based on the daily average of on-balance sheet items and three month-end average of off-balance sheet items (2017 – three month-end average of both on and off-balance sheet items).

Liquidity key metrics

The table below sets out the key liquidity and related metrics monitored by RBS.

2018	RBS	UK DoLSub
Liquidity coverage ratio (1)	158%	153%
Stressed outflow coverage (2)	154%	147%
Net stable funding ratio (3)	141%	144%
2017		
Liquidity coverage ratio (1)	152%	
Stressed outflow coverage (2)	168%	
Net stable funding ratio (3)	132%	

Notes:
(1) On 1 October 2015 the LCR became the PRA's primary regulatory liquidity standard. It is a Pillar 1 metric to which the PRA apply Pillar 2 add-ons. The published LCR excludes Pillar 2 add-ons. RBS calculates the LCR using its own interpretations of the EU LCR Delegated Act, which may change over time and may not be fully comparable with those of other financial institutions.
(2) RBS's stressed outflow coverage (SOC) is an internal measure calculated by reference to liquid assets as a percentage of net stressed contractual and behavioural outflows over three months under the worst of three severe stress scenarios of a market-wide stress, an idiosyncratic stress and a combination of both as per ILAAP. This assessment is performed in accordance with PRA guidance.
(3) In November 2016, the European Commission published its proposal for NSFR rules within the EU as part of its CRR2 package of regulatory reforms. CRR2 NSFR is expected to become the regulatory requirement in future within the EU and the UK. RBS has changed its policy on the NSFR to align with its interpretation of the CRR2 proposals with effect from 1 January 2018. The pro forma CRR2 NSFR at 31 December 2017 under CRR2 proposals is estimated to be 139%.

Capital and risk management

Capital, liquidity and funding risk continued

Capital and leverage: Capital resources (audited)

Capital, RWAs and capital adequacy ratios, on the basis of end-point Capital Requirements Regulation (CRR) and transitional rules, calculated in accordance with PRA definitions, are set out below.

	2018		2017	
	End-point CRR basis £m	PRA transitional basis £m	End-point CRR basis £m	PRA transitional basis £m
Shareholders' equity (excluding non-controlling interests)				
Shareholders' equity	45,736	45,736	48,330	48,330
Preference shares - equity	(496)	(496)	(2,565)	(2,565)
Other equity instruments	(4,058)	(4,058)	(4,058)	(4,058)
	41,182	41,182	41,707	41,707
Regulatory adjustments and deductions				
Own credit	(405)	(405)	(90)	(90)
Defined benefit pension fund adjustment	(394)	(394)	(287)	(287)
Cash flow hedging reserve	191	191	(227)	(227)
Deferred tax assets	(740)	(740)	(849)	(849)
Prudential valuation adjustments	(494)	(494)	(496)	(496)
Goodwill and other intangible assets	(6,616)	(6,616)	(6,543)	(6,543)
Expected losses less impairments	(654)	(654)	(1,286)	(1,286)
Foreseeable ordinary and special dividends	(1,326)	(1,326)	—	—
Other regulatory adjustments	(105)	(105)	28	28
	(10,543)	(10,543)	(9,750)	(9,750)
CET1 capital	30,639	30,639	31,957	31,957
Additional Tier 1 (AT1) capital				
Qualifying instruments and related share premium	4,051	4,051	4,041	4,041
Qualifying instruments and related share premium subject to phase out	—	1,393	—	3,416
Qualifying instruments issued by subsidiaries and held by third parties subject to phase out	—	140	—	140
AT1 capital	4,051	5,584	4,041	7,597
Tier 1 capital	34,690	36,223	35,998	39,554
Qualifying Tier 2 capital				
Qualifying instruments and related share premium	6,301	6,386	6,396	6,501
Qualifying instruments issued by subsidiaries and held by third parties	182	1,565	369	1,876
Tier 2 capital	6,483	7,951	6,765	8,377
Total regulatory capital	41,173	44,174	42,763	47,931

The table below analyses the movement in end-point CRR CET1, AT1 and Tier 2 capital for the year.

	CET1 £m	AT1 £m	Tier 2 £m	Total £m
At 1 January 2018	31,957	4,041	6,765	42,763
Profit for the year	1,381			1,381
Own credit	(315)			(315)
Share capital and reserve movements in respect of employee share schemes	77			77
Ordinary shares issued	135			135
Foreign exchange reserve	308			308
FVOCI reserves	88			88
Goodwill and intangibles deduction	(73)			(73)
Deferred tax assets	109			109
Prudential valuation adjustments	2			2
Expected loss less impairment	632			632
Pension contribution	(1,476)			(1,476)
Capital instruments issued			(89)	(89)
Net dated subordinated debt/grandfathered instruments			(537)	(537)
Foreign exchange movements	(734)		334	(400)
Foreseeable ordinary and special dividends	(1,326)			(1,326)
Other movements	(126)	10	10	(106)
At 31 December 2018	30,639	4,051	6,483	41,173

Capital and risk management

Capital, liquidity and funding risk continued

Leverage exposure

The leverage exposure is based on the CRR Delegated Act.

	End-point basis(1)	
	2018	2017
Leverage exposure	£bn	£bn
Cash and balances at central banks	88.9	98.3
Trading assets	75.1	86.0
Derivatives	133.3	160.8
Loans	318.0	321.6
Other assets	78.9	71.4
Total assets	694.2	738.1
Derivatives		
- netting and variation margin	(141.3)	(161.7)
- potential future exposures	42.1	49.4
Securities financing transactions gross up	2.1	2.3
Undrawn commitments (analysis below)	50.3	53.1
Regulatory deductions and other adjustments	(2.9)	(2.1)
CRR Leverage exposure	644.5	679.1
Claims on central banks	(85.0)	(92.0)
UK leverage exposure	559.5	587.1

Notes:
(1) Based on end-point CRR Tier 1 leverage exposure under the CRR Delegated Act.
(2) The UK leverage ratio excludes central bank claims from the leverage exposure where deposits held are denominated in the same currency and of contractual maturity that is equal or longer than that of the central bank claims.

Weighted undrawn commitments

The table below provides a breakdown of weighted undrawn commitments.

	2018	2017
	£bn	£bn
Unconditionally cancellable credit cards	2.0	2.1
Other unconditionally cancellable items	7.1	4.7
Unconditionally cancellable items (1)	9.1	6.8
Undrawn commitments <1 year which may not be cancelled	1.7	1.8
Other off-balance sheet items with 20% credit conversion factor (CCF)	0.6	0.6
Items with a 20% CCF	2.3	2.4
Revolving credit risk facilities	27.1	27.0
Term loans	3.5	3.6
Mortgages	0.2	—
Other undrawn commitments >1 year which may not be cancelled & off-balance sheet	2.2	2.1
Items with a 50% CCF	33.0	32.7
Items with a 100% CCF	5.9	11.2
Total	50.3	53.1

Note:
(1) Based on a 10% CCF.

Capital, liquidity and funding risk continued

Loss absorbing capital

The following table illustrates the components of estimated loss absorbing capital (LAC) in RBSG plc and operating subsidiaries and includes external issuances only. The table is prepared on a transitional basis, including the benefit of regulatory capital instruments issued from operating companies, to the extent they meet MREL criteria. For further details regarding regulatory requirements in relation to MREL, refer to page 97.

The roll-off profile relating to senior debt and subordinated debt instruments is set out on the next page.

	2018				2017			
	Par value (1) £bn	Balance sheet value £bn	Regulatory value (2) £bn	LAC value (3) £bn	Par value (1) £bn	Balance sheet value £bn	Regulatory value (2) £bn	LAC value (3) £bn
CET1 capital (4)	30.6	30.6	30.6	30.6	32.0	32.0	32.0	32.0
Tier 1 capital: end-point CRR compliant AT1								
of which: RBSG (holdco)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
of which: RBSG operating subsidiaries (opcos)	—	—	—	—	—	—	—	—
	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Tier 1 capital: end-point CRR non compliant								
of which: holdco	1.4	1.6	1.4	0.5	3.5	3.6	3.5	2.6
of which: opcos	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	1.5	1.7	1.5	0.6	3.6	3.7	3.6	2.7
Tier 2 capital: end-point CRR compliant								
of which: holdco	6.8	6.7	6.3	5.1	6.5	6.5	6.4	4.9
of which: opcos	0.5	0.5	0.3	0.5	2.3	2.4	0.5	0.5
	7.3	7.2	6.6	5.6	8.8	8.9	6.9	5.4
Tier 2 capital: end-point CRR non compliant								
of which: holdco	0.1	0.1	0.1	0.1	0.3	0.4	0.1	0.1
of which: opcos	1.9	2.0	1.4	1.6	2.1	2.3	1.5	2.0
	2.0	2.1	1.5	1.7	2.4	2.7	1.6	2.1
Senior unsecured debt securities issued by:								
RBSG holdco	16.8	16.8	—	15.5	9.3	9.2	—	8.3
RBS opcos	17.1	16.9	—	—	14.4	14.7	—	—
	33.9	33.7	—	15.5	23.7	23.9	—	8.3
Total	79.3	79.3	44.2	58.0	74.5	75.2	48.1	54.5
RWAs				188.7				200.9
CRR leverage exposure				644.5				679.1
LAC as a ratio of RWAs				30.7%				27.1%
LAC as a ratio of CRR leverage exposure				9.0%				8.0%

Notes:
(1) Par value reflects the nominal value of securities issued.
(2) Regulatory capital instruments issued from operating companies are included in the transitional LAC calculation, to the extent they meet the MREL criteria.
(3) LAC value reflects RBS's interpretation of the Bank of England's approach to setting a minimum requirement for own funds and eligible liabilities (MREL), published in June 2018. MREL policy and requirements remain subject to further potential development, as such RBS estimated position remains subject to potential change. Liabilities excluded from LAC include instruments with less than one year remaining to maturity, structured debt, operating company senior debt, and other instruments that do not meet the MREL criteria. Includes Tier 1 and Tier 2 securities prior to incentive to redeem.
(4) Corresponding shareholders' equity was £45.7 billion (2017 - £48.3 billion).
(5) Regulatory amounts reported for AT1, Tier 1 and Tier 2 instruments are before grandfathering restrictions imposed by CRR.

Capital, liquidity and funding risk continued

Roll-off profile

The following table illustrates the roll-off profile and weighted average spreads of RBS's major wholesale funding programmes.

Senior debt roll-off profile (1)	As at and for year ended 31 December	Roll-off profile					
RBSG	2018	H1 2019	H2 2019	2020	2021	2022 & 2023	2024 & later
- amount (£m)	16,830	535	781	2	—	7,037	8,474
- weighted average rate spread (bps)	205	129	283	162	—	224	187
NWM Plc							
- amount (£m)	16,523	3,186	3,239	4,704	2,066	2,022	1,306
- weighted average rate spread (bps)	102	13	177	123	91	80	117
NatWest Plc							
- amount (£m)	329	253	77	—	—	—	—
- weighted average rate spread (bps)	7	4	15	—	—	—	—
Securitisation							
- amount (£m)	1,375	—	—	—	—	—	1,375
- weighted average rate spread (bps)	418	—	—	—	—	—	418
Covered bonds							
- amount (£m)	5,367	—	—	3,145	—	—	2,222
- weighted average rate spread (bps)	122	—	—	99	—	—	156
Total notes issued (£m)	40,424	3,974	4,097	7,852	2,066	9,059	13,377
Weighted average spread	158	27	194	113	91	192	200
Subordinated debt instruments roll-off profile (2)							
RBSG (£m)	6,815	1,003	—	—	—	4,049	1,763
NWM Plc (£m)	658	—	36	99	—	450	73
NatWest Plc (£m)	1,159	727	—	—	343	90	—
NWM N.V. (£m)	668	147	65	11	—	106	339
UBI DAC (£m)	76	—	—	—	—	—	76
Total (£m)	9,377	1,876	101	110	343	4,695	2,252

Notes:
(1) Based on final contractual instrument maturity.
(2) Based on first call date of instrument, however this does not indicate RBS's strategy on capital and funding management. The table above does not include debt accounted Tier 1 instruments although those instruments form part of the total subordinated debt balance.
(3) The weighted average spread reflects the average net funding cost to RBS and is calculated on an indicative basis.
(4) The roll-off table is based on sterling-equivalent balance sheet values.

Risk-weighted assets

The table below analyses the movement in credit risk RWAs on the end-point CRR basis during the year, by key drivers.

	Credit risk £bn	Counterparty credit risk £bn	Market risk £bn	Operational risk £bn	Total RWAs £bn
At 1 January 2018 (1)	144.6	15.4	17.0	23.8	200.8
Foreign exchange movement	1.0	(0.1)	—	—	0.9
Business movements	(11.3)	(0.9)	(1.4)	(1.4)	(15.0)
Risk parameter changes (2)	(0.9)	(0.1)	—	—	(1.0)
Methodology changes	—	—	(0.2)	—	(0.2)
Model updates	4.5	—	(0.6)	—	3.9
Other movements	—	(0.7)	—	—	(0.7)
At 31 December 2018	137.9	13.6	14.8	22.4	188.7

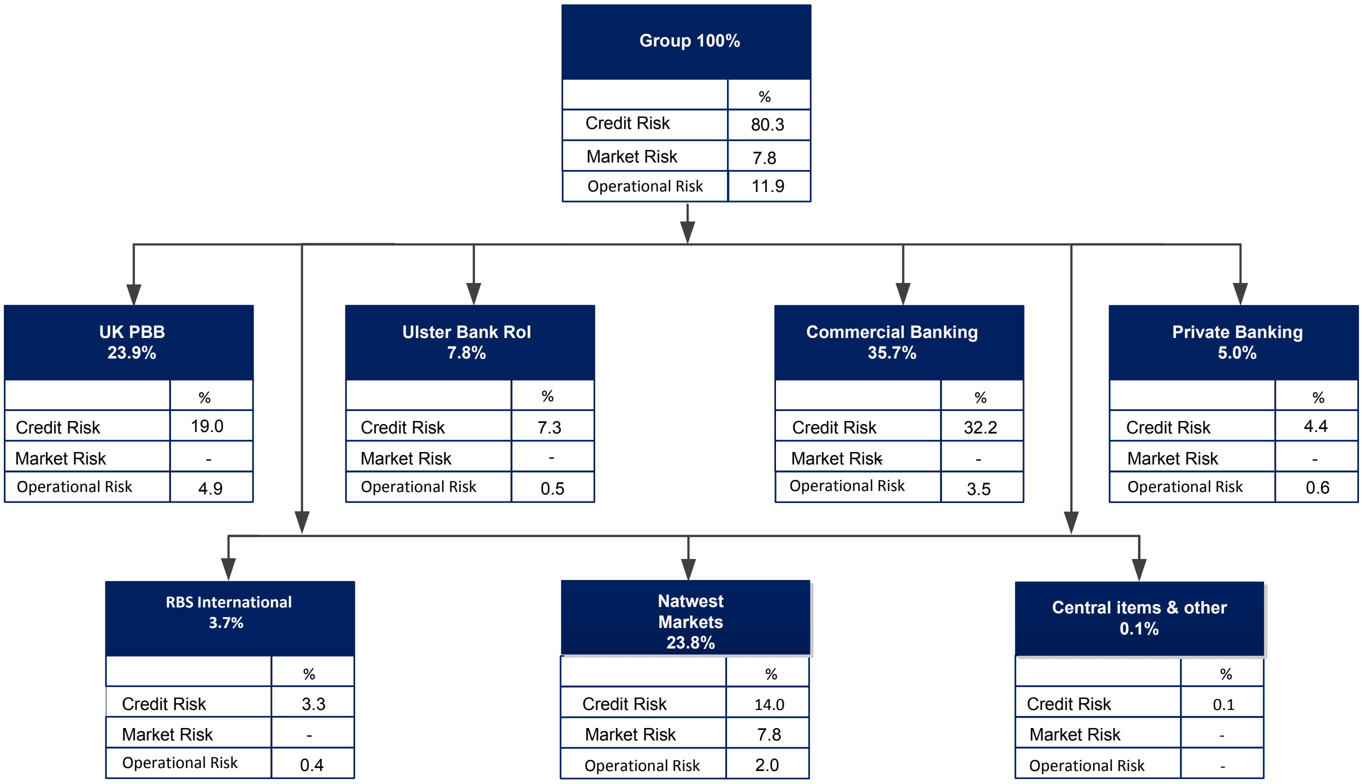
Notes:
(1) There was a £0.1 billion reduction in RWAs from 31 December 2017 to 1 January 2018 reflecting the day one impact of the adoption of IFRS 9.
(2) Risk parameter changes relate to changes in credit quality metrics of customers and counterparties (such as probability of default and loss given default) as well as IRB model changes relating to counterparty credit risk in line with EBA Pillar 3 Guidelines.

Capital and risk management

Capital, liquidity and funding risk continued

RWAs by segment

The chart below illustrates the concentration of risk-weighted assets by segment.



The table below analyses the movement in end-point CRR RWAs by segment during the year.

Total RWAs	UK PBB £bn	Ulster Bank RoI £bn	Commercial Banking £bn	Private Banking £bn	RBSI £bn	NatWest Markets £bn	Central items & other £bn	Total £bn
At 1 January 2018 (1)	43.0	18.0	71.8	9.1	5.1	52.9	0.9	200.8
Foreign exchange movement	—	0.1	0.3	—	—	0.4	0.1	0.9
Business movements	(0.3)	(2.2)	(4.9)	0.3	0.3	(8.3)	0.1	(15.0)
Risk parameter changes (2)	0.8	(1.2)	(0.5)	—	—	—	(0.1)	(1.0)
Methodology changes	—	—	—	—	—	—	(0.2)	(0.2)
Model updates	1.7	—	2.9	—	(0.1)	(0.6)	—	3.9
Other movements	(0.1)	—	(2.0)	—	1.6	0.5	(0.7)	(0.7)
At 31 December 2018	45.1	14.7	67.6	9.4	6.9	44.9	0.1	188.7
Credit risk	35.8	13.8	61.0	8.3	6.2	12.7	0.1	137.9
Counterparty credit risk	—	—	—	—	—	13.6	—	13.6
Market risk	—	—	—	—	—	14.8	—	14.8
Operational risk	9.3	0.9	6.6	1.1	0.7	3.8	—	22.4
Total RWAs	45.1	14.7	67.6	9.4	6.9	44.9	0.1	188.7

Notes:
(1) There was a £0.1 billion reduction in RWAs from 31 December 2017 to 1 January 2018 reflecting the day one impact of the adoption of IFRS 9.
(2) Risk parameter changes relate to changes in credit quality metrics of customers and counterparties (such as probability of default and loss given default) as well as IRB model changes relating to counterparty credit risk in line with EBA Pillar 3 Guidelines.

Key points

- RWAs decreased by £12.2 billion (excluding the day one impact of the adoption of IFRS 9) in 2018 primarily driven by the legacy business in NatWest Markets, the impact of capital initiatives in Commercial Banking and Ulster Bank RoI asset sale. These reductions were partially offset by increases in UK PBB and RBSI.
- The decrease in NatWest Markets primarily driven by the legacy business, in addition to reductions in the core business.
- The reduction within Commercial Banking was due to active capital management, partially offset by the impact of model updates and underlying business growth.
- Ulster Bank RoI RWAs reduced principally reflecting the impact of a non-performing loan sale and an improvement in credit metrics.
- RWAs in UK PBB increased mainly due to model updates and movements in risk parameters.
- As part of the preparation for ICB ring-fencing, assets have transferred from UK PBB, Commercial Banking and Treasury into RBSI and NatWest Markets which are shown in other movements. Other movements also reflects NWM Securities Inc. being granted the regulatory waiver to use the AIRB approach to calculate it's counterparty credit risk capital requirements.

Capital, liquidity and funding risk continued

Liquidity portfolio (audited)

The table below shows the liquidity portfolio by product, liquidity value and carrying value. Liquidity value is lower than carrying value as it is stated after discounts (or haircuts) applied to instruments by the Bank of England and other central banks. Secondary liquidity comprises assets eligible for discount at central Banks but these do not form part of the liquid asset portfolio reported for regulatory LCR purposes or internal stressed outflow coverage purposes.

	Liquidity value				
	2018			2017	
	RBS (1) £m	UK DoLSub (2) £m	NWM Plc £m	RBS £m	UK DoLSub (2) £m
Cash and balances at central banks	83,781	59,745	11,005	93,657	91,377
Central and local government bonds					
AAA rated governments	8,188	4,386	615	3,944	2,760
AA- to AA+ rated governments and US agencies	35,683	25,845	5,256	26,233	24,084
	43,871	30,231	5,871	30,177	26,844
Primary liquidity	127,652	89,976	16,876	123,834	118,221
Secondary liquidity (3)	70,231	69,642	344	62,555	62,144
Total liquidity value	197,882	159,618	17,220	186,389	180,365
Total carrying value	225,039	186,340	17,388	209,892	203,733

Notes:

(1) RBS includes UK DoLSub, NatWest Markets plc and other significant operating subsidiaries that hold liquidity portfolios. These include RBS International, NWM N.V. and Ulster Bank Ireland DAC who hold managed portfolios that comply with local regulations that may differ from PRA rules.

(2) UK DoLSub comprises RBS's four licensed deposit-taking UK banks within the ring-fenced bank: National Westminster Bank Plc The Royal Bank of Scotland plc, Coutts & Co and Ulster Bank Limited. The reduction in the UK DoLSub liquidity balances during 2018 is driven by NatWest Markets and RBS International managing liquidity on a stand-alone basis, with NatWest Markets plc leaving the UK DoLSub during H2 2018 and RBS International building its own liquidity portfolio.

(3) Comprises assets eligible for discounting at the Bank of England and other central banks.

Capital, liquidity and funding risk continued

Funding sources (audited)

The table below shows the carrying values of the principal funding sources based on contractual maturity. Balance sheet captions include balances held at all classifications under IFRS 9/IAS 39 but excludes derivative cash collateral.

	2018			2017		
	Short-term less than 1 year £m	Long-term more than 1 year £m	Total £m	Short-term less than 1 year £m	Long-term more than 1 year £m	Total £m
Personal and corporate deposits						
Personal (1)	178,293	1,499	179,792	173,314	1,497	174,811
Corporate (2)	131,575	142	131,717	127,708	861	128,569
	309,868	1,641	311,509	301,022	2,358	303,380
Financial institutions deposits						
Banks (3)	6,758	15,865	22,623	7,480	19,595	27,075
Non-bank financial institutions (NBFI) (4)	46,800	564	47,364	52,284	1,091	53,375
	53,558	16,429	69,987	59,764	20,686	80,450
Debt securities in issue						
Commercial papers (CP's) and certificates of deposits (CD'S)	3,157	—	3,157	4,637	—	4,637
Medium-term notes	4,928	25,596	30,524	2,316	16,902	19,218
Covered bonds	—	5,367	5,367	987	5,321	6,308
Securitisations	—	1,375	1,375	—	396	396
	8,085	32,338	40,423	7,940	22,619	30,559
Subordinated liabilities	299	10,236	10,535	2,383	10,339	12,722
Repos (5)						
Sovereign	405	—	405	5,243	—	5,243
Financial institutions	29,664	—	29,664	31,891	—	31,891
Corporate	291	—	291	1,287	—	1,287
	30,360	—	30,360	38,421	—	38,421
Total funding	402,170	60,644	462,814	409,530	56,002	465,532
Of which: available in resolution (6)	—	*22,909*	*22,909*	—	*15,840*	*15,840*
CET 1 capital			30,639			31,957
CRR Leverage exposure			644,498			679,120
Funded assets			560,886			577,213
Funding coverage of CET 1 capital			15			15
Funding as a % of leverage exposure			72%			69%
Funding as a % of funded assets			83%			81%
Funding available in resolution as a % of CET1 capital			75%			50%
Funding available in resolution as a % of leverage exposure			4%			2%

Notes:
(1) Includes £206 million (2017 - £190 million) of DFV deposits included in other financial liabilities on the balance sheet.
(2) Includes £428 million (2017 - £691 million) of HFT deposits included in trading liabilities and nil (2017 - £561 million) of DFV deposits included in other financial liabilities on the balance sheet.
(3) Includes £267 million (2017 - £68 million) of HFT deposits included in trading liabilities on the balance sheet. Includes £14.0 billion (2017 - £19.0 billion) relating to Term Funding Scheme participation and £1.8 billion (2017 - £1.8 billion) relating to RBS's participation in central bank financing operations under the European Central Bank's Targeted Long-term refinancing operations.
(4) Includes £1,093 million (2017 - £543 million) of HFT deposits included in trading liabilities and £7 million (2017 - £124 million) of DFV deposits included in other financial liabilities on the balance sheet.
(5) Includes held-for-trading repos of £25,645 million (2017 - £28,363 million) and amortised cost repos of £4,715 million (2017 - £10,058 million).
(6) Eligible liabilities (as defined in the Banking Act 2009 as amended from time to time) that meet the eligibility criteria set out in the regulations, rules, policies, guidelines, or statements of the Bank of England including the Statement of Policy published by the Bank of England in June 2018. The balance consist of £16 billion (2017 - £8 billion) under debt securities in issue (senior MREL) and £7 billion (2017 - £8 billion) under subordinated liabilities.

Capital, liquidity and funding risk continued

Contractual maturity (audited)

This table shows the residual maturity of financial instruments, based on contractual date of maturity of RBS's banking activities, including hedging derivatives. Trading activities comprising Mandatory fair value through profit or loss (MFVTPL) assets and held-for-trading (HFT) liabilities have been excluded from the maturity analysis due to their short-term nature and are shown in total in the table below.

	Banking activities										
2018	Less than 1 month £m	1-3 months £m	3-6 months £m	6 months - 1 year £m	Subtotal £m	1-3 years £m	3-5 years £m	More than 5 years £m	Total £m	Trading activities £m	Total £m
Central bank balances	88,897	—	—	—	88,897	—	—	—	88,897		88,897
Trading assets										75,119	75,119
Derivatives	224	—	—	529	753	994	345	159	2,251	131,098	133,349
Settlement balances	2,928	—	—	—	2,928	—	—	—	2,928		2,928
Loans to banks	11,729	182	860	62	12,833	105	9	—	12,947		12,947
Loans to customers (1)	35,800	8,350	8,626	17,896	70,672	53,500	41,848	142,387	308,407		308,407
Personal	5,733	2,475	3,350	6,233	17,791	21,949	18,658	120,728	179,126		179,126
Corporate	26,260	4,499	4,118	7,868	42,745	27,413	21,159	20,417	111,734		111,734
NBFI	3,807	1,376	1,158	3,795	10,136	4,138	2,031	1,242	17,547		17,547
Other financial assets	1,252	3,165	2,473	4,754	11,644	13,904	10,630	21,669	57,847	1,638	59,485
Total financial assets	140,830	11,697	11,959	23,241	187,727	68,503	52,832	164,215	473,277	207,855	681,132
2017											
Total financial assets	149,774	12,333	11,190	22,517	195,814	64,939	52,064	168,380	481,197	243,867	725,064
Bank deposits	4,585	1,891	16	5	6,497	13,799	2,000	60	22,356		22,356
Bank repos	517	424	—	—	941	—	—	—	941		941
Customer repos	3,774	—	—	—	3,774	—	—	—	3,774		3,774
Customer deposits	337,964	9,310	4,803	3,297	355,374	1,718	11	37	357,140		357,140
Personal	170,746	3,080	1,835	2,426	178,087	1,499	—	—	179,586		179,586
Corporate	132,994	3,056	1,842	631	138,523	83	1	35	138,642		138,642
NBFI	34,224	3,174	1,126	240	38,764	136	10	2	38,912		38,912
Settlement balances	3,066	—	—	—	3,066	—	—	—	3,066		3,066
Trading liabilities										72,350	72,350
Derivatives	—	181	306	—	487	1,062	416	978	2,943	125,954	128,897
Other financial liabilities	202	1,386	2,499	4,153	8,240	9,542	10,536	11,414	39,732		39,732
CPs and CDs	173	1,128	955	901	3,157	—	—	—	3,157		3,157
Medium-term notes	7	225	1,490	3,149	4,871	6,397	10,536	7,817	29,621		29,621
Covered bonds	—	—	—	—	—	3,145	—	2,222	5,367		5,367
Securitisations	—	—	—	—	—	—	—	1,375	1,375		1,375
Customer deposits DFV	22	33	54	103	212	—	—	—	212		212
Subordinated liabilities	16	39	164	80	299	450	4,534	5,252	10,535		10,535
Other liabilities (2)	2,152	—	—	—	2,152	—	—	—	2,152		2,152
Total financial liabilities	352,276	13,231	7,788	7,535	380,830	26,571	17,497	17,741	442,639	198,304	640,943
2017											
Total financial liabilities	360,684	10,564	8,155	6,647	386,050	16,882	23,262	17,167	443,361	232,917	676,278

Note:
(1) Loans to customers excludes £3,318 million (2017 - £3,814 million) of Impairment provisions.
(2) Represents notes in circulation.

Capital and risk management

Capital, liquidity and funding risk continued

Funding gap: maturity and segment analysis

The contractual maturity of balance sheet assets and liabilities reflects the maturity transformation role banks perform, lending long-term but mainly obtaining funding through short-term liabilities such as customer deposits. In practice, the behavioural profiles of many liabilities show greater stability and longer maturity than the contractual maturity. This is particularly true of many types of retail and corporate deposits which, despite being repayable on demand or at short notice, have demonstrated very stable characteristics even in periods of acute stress.

In its analysis to assess and manage asset and liability maturity gaps, RBS determines the expected customer behaviour through qualitative and quantitative techniques. These incorporate observed customer behaviours over long periods of time. This analysis is subject to governance through RBS ALCo Technical committee down to a segment level.

The net behavioural funding surplus/(gap) and contractual maturity analysis is set out below.

	Contractual maturity (1)												Behavioural maturity			
	Loans to customers				Customer accounts				Net surplus/(gap)				Net surplus/(gap)			
	Less than 1 year	1-5 years	Greater than 5 years	Total	Less than 1 year	1-5 years	Greater than 5 years	Total	Less than 1 year	1-5 years	Greater than 5 years	Total	Less than 1 year	1-5 years	Greater than 5 years	Total
2018	£bn	£bn	£bn	£bn	£bn	£bn	£bn	£bn	£bn	£bn	£bn	£bn	£bn	£bn	£bn	£bn
UK PBB	15	39	108	162	183	1	—	184	168	(38)	(108)	22	(2)	16	8	22
UB RoI	2	6	11	19	18	—	—	18	16	(6)	(11)	(1)	1	(3)	1	(1)
CB	35	38	16	89	95	1	—	96	60	(37)	(16)	7	(1)	20	(12)	7
PB	5	5	4	14	28	—	—	28	23	(5)	(4)	14	2	1	11	14
RBSI	6	5	3	14	28	—	—	28	22	(5)	(3)	14	1	3	10	14
NWM	17	3	1	21	13	—	—	13	(4)	(3)	(1)	(8)	(2)	(4)	(2)	(8)
Centre	—	—	—	—	1	—	—	1	1	—	—	1	1	—	—	1
Total	80	96	143	319	366	2	—	368	286	(94)	(143)	49	—	33	16	49
2017																
Total	83	93	147	323	363	4	—	367	280	(89)	(147)	44	(6)	24	26	44

Note:
(1) Loans to customers and customer accounts include trading assets and trading liabilities respectively and excludes reverse repos and repos.

Key points

- The net customer funding surplus has increased by £5billion during 2018 to £49billion driven by £1billion deposit growth and £4billion lending reduction
- Customer deposits and customer loans are broadly matched from a behavioural perspective.
- The net funding surplus in 2018 is concentrated in the longer dated buckets, reflecting the stable characteristics of customer deposits and lending that is behaviourally shorter dated.

Encumbrance (audited)

RBS evaluates the extent to which assets can be financed in a secured form (encumbrance), but certain asset types lend themselves more readily to encumbrance. The typical characteristics that support encumbrance are an ability to pledge those assets to another counterparty or entity through operation of law without necessarily requiring prior notification, homogeneity, predictable and measurable cash flows, and a consistent and uniform underwriting and collection process. Retail assets including residential mortgages, credit card receivables and personal loans display many of these features.

RBS categorises its assets into three broad groups, those that are:
Already encumbered and used to support funding currently in place through own-asset securitisations, covered bonds and securities repurchase agreements.
Pre-positioned with central banks as part of funding schemes and those encumbered under such schemes.
Not currently encumbered. In this category, RBS has in place an enablement programme which seeks to identify assets capable of being encumbered and to identify the actions to facilitate such encumbrance whilst not affecting customer relationships or servicing.

Programmes to manage the use of assets to support funding actively are established within UK DoLSub, UBI DAC and NatWest Markets Plc.

Capital, liquidity and funding risk continued

Balance sheet encumbrance (audited)

The table shows the retained encumbered assets of the Group. Derivatives and Reverse Repos are disclosed within the credit risk section on pages 147 and 148.

2018	Encumbered as a result of transactions with counterparties other than central banks: Covered debts & securitisations (1) £bn	SFT, Derivatives and similar (2) £bn	Total (3) £bn	Pre-positioned & encumbered assets held at central banks (4) £bn	Unencumbered assets not pre-positioned with central banks: Readily available (5) £bn	Other available (6) £bn	Cannot be used (7) £bn	Total £bn	Total £bn
Cash and balances at central banks	—	6.7	6.7	—	82.2	—	—	82.2	88.9
Trading assets	—	49.1	49.1	—	—	1.3	24.7	26.0	75.1
Derivatives	—	—	—	—	—	—	133.3	133.3	133.3
Settlement balances	—	—	—	—	—	—	2.9	2.9	2.9
Loans to banks - amortised cost	0.4	1.0	1.4	—	6.6	0.4	4.5	11.5	12.9
Loans to customers - amortised cost									
- residential mortgages									
- UK	7.1	—	7.1	110.1	20.9	11.5	—	32.4	149.6
- RoI	2.8	—	2.8	2.1	8.9	—	—	8.9	13.8
- credit cards	—	—	—	—	3.7	0.3	—	4.0	4.0
- personal loans	—	—	—	—	5.8	2.6	1.8	10.2	10.2
- other	2.4	2.4	4.8	4.9	2.3	91.0	24.5	117.8	127.5
Other financial assets	—	10.4	10.4	—	46.0	0.8	2.3	49.1	59.5
Intangible assets	—	—	—	—	—	—	6.6	6.6	6.6
Other assets	—	—	—	—	—	2.3	7.6	9.9	9.9
Total assets	12.7	69.6	82.3	117.1	176.4	110.2	208.2	494.8	694.2
2017									
Total assets	13.7	69.9	83.6	113.1	180.0	118.6	242.8	541.4	738.1

Notes:
(1) Covered debts and securitisations include securitisations, conduits, covered bonds and secured notes.
(2) Repos and other secured deposits, cash, coin and nostro balance held with the Bank of England as collateral against deposits and notes in circulation are included here rather than within those positioned at the central bank as they are part of normal banking operations. Securities financing transactions (SFT) include collateral given to secure derivative liabilities.
(3) Total assets encumbered as a result of transactions with counterparties other than central banks are those that have been pledged to provide security and are therefore not available to secure funding or to meet other collateral needs.
(4) Assets pre-positioned at the central banks include loans provided as security as part of funding schemes and those encumbered under such schemes.
(5) Readily available for encumbrance: including assets that have been enabled for use with central banks but not pre-positioned; cash and high quality debt securities that form part of RBS's liquidity portfolio and unencumbered debt securities.
(6) Other assets that are capable of being encumbered are those assets on the balance sheet that are available for funding and collateral purposes but are not readily realisable in their current form. These assets include loans that could be prepositioned with central banks but have not been subject to internal and external documentation review and diligence work.
(7) Cannot be used includes:
 (a) Derivatives, reverse repurchase agreements and trading related settlement balances.
 (b) Non-financial assets such as intangibles, prepayments and deferred tax.
 (c) Loans that cannot be pre-positioned with central banks based on criteria set by the central banks, including those relating to date of origination and level of documentation.
 (d) Non-recourse invoice financing balances and certain shipping loans whose terms and structure prohibit their use as collateral.
(8) In accordance with market practice, RBS employs securities recognised on the balance sheet, and securities received under reverse repo transactions as collateral for repos.

Capital and risk management

Credit risk

Definition

Credit risk is the risk that customers fail to meet their contractual obligation to settle outstanding amounts.

The following disclosures in this section are audited:

- Forbearance.
- Impairment, provisioning and write-offs.
- Transition from IAS 39 to IFRS 9.
- Key elements of IFRS 9 impairment provisions:
  - Economic loss drivers (excluding economic parameters).
  - IFRS 9 credit risk modelling.
  - Significant increase in credit risk.
  - Asset lifetimes.
- Measurement uncertainty and ECL sensitivity analysis.
- Banking activities (except PDs and additional Stage 2 and Stage 3 analysis).
- Trading activities.

Sources of risk

The principal sources of credit risk for RBS are lending, off-balance sheet products, derivatives and securities financing, and debt securities. RBS is also exposed to settlement risk through foreign exchange, trade finance and payments activities.

Key developments in 2018

- Asset quality (AQ) remained stable with 61% of the loan exposure and other financial assets rated AQ1-AQ4 (1 January 2018 – 62%) (equating to an indicative investment rating of BBB- or better).
- New mortgage lending declined in 2018 (£32.8 billion compared to £33.9 billion in 2017). The overall personal portfolio increased by £1.7 billion (principally driven by growth of the mortgage portfolio).
- While overall credit quality remained stable in the Wholesale portfolio, risk appetite was tightened in certain sectors where it was considered appropriate based on leading indicator information.
- IFRS 9 Financial Instruments, which covers credit provisions, was implemented with effect from 1 January 2018. In line with expectations, the new accounting standard resulted in an overall increase in provisions compared with the previous accounting standard IAS 39. Further detail is provided later in the report.
- Impairment provisions totalled £3.4 billion at the year end representing coverage on amortised cost loans excluding balances at central banks of 1.1%.
- The ECL charge for the year was £398 million. This reflected the relatively stable external environment.

Risk governance

Credit risk management activities include:

- Defining credit risk appetite for the management of concentration risk and credit policy to establish the key risks in the process of providing credit and the controls that must be in place to mitigate them.
- Approving credit limits for customers.
- Oversight of the first line of defence to ensure that credit risk remains within the risk appetite set by the Board and that credit policy controls are being operated adequately and effectively.

The Chief Credit Officer, Ring-Fenced Bank, chairs the Wholesale and Retail Credit Risk Committees. These committees provide oversight of the aggregated RBS credit risk profile and review, recommend or approve risk appetite limits (depending on their materiality) within the appetite set by the RBS Board.

The Chief Credit Officer, Ring-Fenced Bank, also chairs provisions committees in PBB and CPB. These committees review and approve individually assessed net expected credit losses (ECLs) above agreed approval thresholds and review and approve the adequacy of all portfolio level ECLs in the businesses. Similar provisions committees operate in Ulster Bank RoI, NatWest Markets and RBSI.

Risk appetite

RBS's approach to lending is governed by comprehensive credit risk appetite frameworks. The frameworks are closely monitored and actions are taken to adapt lending criteria as appropriate. Credit risk appetite aligns to the strategic risk appetite set by the Board, which includes capital adequacy, earnings volatility, funding and liquidity, and stakeholder confidence. The credit risk appetite frameworks have been designed to reflect factors (for example, strategic and emerging risks) that influence the ability to operate within risk appetite. Tools such as stress testing and economic capital are used to measure credit risk volatility and develop links between the credit risk appetite frameworks and risk appetite limits. The frameworks are supported by a suite of transaction acceptance standards that set out the risk parameters within which franchises should operate.

The Personal credit risk appetite framework sets limits that measure and control the quality of both existing and new business for each relevant franchise or business segment. The actual performance of each portfolio is tracked relative to these limits and management action is taken where necessary. The limits apply to a range of credit risk-related measures including expected loss at both portfolio and product level, projected credit default rates across products and the loan-to-value (LTV) ratio of the Personal mortgage portfolios.

For Wholesale, the four formal frameworks used – and their basis for classification – are detailed in the following table.

	Basis for classification	
Framework	Measure	Other
Single name concentration	Exposure	Risk – based on loss given default for a given probability of default
Sector	Exposure	Risk – based on economic capital and other qualitative factors
Country	Exposure	Probability of default of a sovereign and average loss given default
Product and asset class	Exposure	Risk – based on heightened risk characteristics

Risk controls

Credit policy standards are in place for both the Wholesale and Personal portfolios. They are expressed as a set of mandatory controls.

Risk identification and measurement

Credit stewardship

Risks are identified through relationship management and/or credit stewardship of portfolios or customers. Credit risk stewardship takes place throughout the customer relationship, beginning with the initial approval. It includes the application of credit assessment standards, credit risk mitigation and collateral, ensuring that credit documentation is complete and appropriate, carrying out regular portfolio or customer reviews and problem debt identification and management.

Credit risk continued

Risk models

The output of credit risk models is used in the credit approval process – as well as for ongoing assessment, monitoring and reporting – to inform risk appetite decisions. These models are divided into different categories. Where the calculation method is on an individual counterparty or account level, the models used will be probability of default (PD), loss given default (LGD), or exposure at default (EAD). The economic capital model is used for credit risk appetite setting.

Asset quality

All credit grades map to an asset quality scale, used for external financial reporting. For Wholesale customers, a master grading scale is used for internal management reporting across portfolios. Accordingly, measures of risk exposure may be aggregated and reported at differing levels of detail depending on stakeholder or business requirements. Performing loans are defined as AQ1-AQ9 (where the PD is less than 100%) and non-performing loans as AQ10 or Stage 3 under IFRS 9 (where the PD is 100%).

Risk mitigation

Risk mitigation techniques, as set out in the appropriate credit policies, are used in the management of credit portfolios across RBS. These techniques mitigate credit concentrations in relation to an individual customer, a borrower group or a collection of related borrowers. Where possible, customer credit balances are netted against obligations. Mitigation tools can include structuring a security interest in a physical or financial asset, the use of credit derivatives including credit default swaps, credit-linked debt instruments and securitisation structures, and the use of guarantees and similar instruments (for example, credit insurance) from related and third parties. Property is used to mitigate credit risk across a number of portfolios, in particular residential mortgage lending and commercial real estate (CRE).

The valuation methodologies for residential mortgage collateral and CRE are detailed below.

Residential mortgages – RBS takes collateral in the form of residential property to mitigate the credit risk arising from mortgages. RBS values residential property during the loan underwriting process by either appraising properties individually or valuing them collectively using statistically valid models. RBS updates residential property values quarterly using the relevant residential property index namely:

Region	Index used
UK	Halifax quarterly regional house price index
Northern Ireland	UK House Price Index (published by the Land Registry)
Republic of Ireland	Central Statistics Office residential property price index

The current indexed value of the property is a component of the ECL provisioning calculation.

Commercial real estate valuations – RBS has a panel of chartered surveying firms that cover the spectrum of geography and property sectors in which RBS takes collateral. Suitable valuers for particular assets are contracted through a single service agreement to ensure consistency of quality and advice. Valuations are commissioned when an asset is taken as security; a material increase in a facility is requested; or a default event is anticipated or has occurred. In the UK, an independent third-party market indexation is applied to update external valuations once they are more than a year old and every three years a formal independent valuation is commissioned.

In the Republic of Ireland, assets are revalued in line with the Central Bank of Ireland threshold requirements, which permits indexation for lower value assets, but demands regular Red Book valuations for distressed higher value assets. The current indexed value of the property is a component of the ECL provisioning calculation.

Counterparty credit risk

In addition to the credit risk management practices set out in this section, RBS mitigates counterparty credit risk arising from both derivatives transactions and repurchase agreements through the use of market standard documentation, enabling netting (for credit risk management only and not for accounting purposes), and through collateralisation.

Amounts owed by RBS to a counterparty are netted against amounts the counterparty owes RBS, in accordance with relevant regulatory and internal policies. Netting is only applied if a netting agreement is in place.

Risk assessment and monitoring

Practices for credit stewardship – including credit assessment, approval and monitoring as well as the identification and management of problem debts – differ between the Personal and Wholesale portfolios.

Personal

Personal customers are served through a lending approach that entails making a large number of small-value loans. To ensure that these lending decisions are made consistently, RBS analyses internal credit information as well as external data supplied from credit reference agencies (including historical debt servicing behaviour of customers with respect to both RBS and other lenders). RBS then sets its lending rules accordingly, developing different rules for different products.

The process is then largely automated, with each customer receiving an individual credit score that reflects both internal and external behaviours and this score is compared with the lending rules set. For relatively high-value, complex personal loans, including some residential mortgage lending, specialist credit managers make the final lending decisions. These decisions are made within specified delegated authority limits that are issued dependent on the experience of the individual.

Underwriting standards and portfolio performance are monitored on an ongoing basis to ensure they remain adequate in the current market environment and are not weakened materially to sustain growth.

Wholesale

Wholesale customers – including corporates, banks and other financial institutions – are grouped by industry sectors and geography as well as by product/asset class and are managed on an individual basis. Consideration is given to identifying groups of individual customers with sufficient inter-connectedness to merit assessment as a single risk.

A credit assessment is carried out before credit facilities are made available to customers. The assessment process is dependent on the complexity of the transaction.

For lower risk transactions below specific thresholds, credit decisions can be approved through self-sanctioning within the business. This process is facilitated through an auto-decision making system, which utilises scorecards, strategies and policy rules to provide a recommended credit decision. Such credit decisions must be within the approval authority of the relevant business sanctioner.

Credit risk continued

For all other transactions credit is only granted to customers following joint approval by an approver from the business and the credit risk function. The joint business and credit approvers act within a delegated approval authority under the Wholesale Credit Authorities Framework Policy. The level of delegated authority held by approvers is dependent on their experience and expertise with only a small number of senior executives holding the highest approval authority. Both business and credit approvers are accountable for the quality of each decision taken, although the credit risk approver holds ultimate sanctioning authority.

Transaction Acceptance Standards provide detailed transactional lending and risk acceptance metrics and structuring guidance. As such, these standards provide a mechanism to manage risk appetite at the customer/transaction level and are supplementary to the established credit risk appetite.

Credit grades (PD and LGD) are reviewed and if appropriate re-approved annually. The review process assesses borrower performance, including reconfirmation or adjustment of risk parameter estimates; the adequacy of security; compliance with terms and conditions; and refinancing risk.

A key aspect of credit risk stewardship is ensuring that, when signs of customer stress are identified, appropriate debt management actions are applied.

Problem debt management

Personal

Early problem identification

Pre-emptive triggers are in place to help identify customers that may be at risk of being in financial difficulty. These triggers are both internal, using RBS data and external information from credit reference agencies. Pro-active contact is then made with the customer to establish if they require help with managing their finances. By adopting this approach the aim is to prevent a customer's financial position deteriorating which may then require intervention from the Collections and Recoveries teams.

Personal customers experiencing financial difficulty are managed by the Collections team. If the Collections team is unable to provide appropriate support after discussing suitable options with the customer, management of that customer moves to the Recoveries team. If at any point in the Collections and Recoveries process, the customer is identified as being potentially vulnerable, the customer will be separated from the regular process and supported by a specialist team to ensure the customer receives appropriate support for their circumstances.

Collections

When a customer exceeds an agreed limit or misses a regular monthly payment the customer is contacted by RBS and requested to remedy the position. If the situation is not regularised then, where appropriate, the Collections team will become more fully involved and the customer will be supported by skilled debt management staff who endeavour to provide customers with bespoke solutions. Solutions include short-term account restructuring, refinance loans and forbearance which can include interest suspension and 'breathing space'. In the event that an affordable/sustainable agreement with a customer cannot be reached, the debt will transition to the Recoveries team. For provisioning purposes, under IFRS 9, exposure to customers managed by the Collections team is categorised as Stage 2 and subject to a lifetime loss assessment.

In the Republic of Ireland, the relationship may pass to a specialist support team prior to any transfer to recoveries, depending on the outcome of customer financial assessment.

Recoveries

The Recoveries team will issue a notice of intention to default to the customer and, if appropriate, a formal demand, while also registering the account with credit reference agencies where appropriate. Following this, the customer's debt may then be placed with a third-party debt collection agency, or alternatively a solicitor, in order to agree an affordable repayment plan with the customer. Exposures subject to formal debt recovery are defaulted and categorised as Stage 3 impaired.

Wholesale

Early problem identification

Each segment and sector has defined early warning indicators to identify customers experiencing financial difficulty, and to increase monitoring if needed. Early warning indicators may be internal, such as a customer's bank account activity, or external, such as a publicly-listed customer's share price. If early warning indicators show a customer is experiencing potential or actual difficulty, or if relationship managers or credit officers identify other signs of financial difficulty they may decide to classify the customer within the Risk of Credit Loss framework.

Risk of Credit Loss framework

The framework focuses on Wholesale customers whose credit profiles have deteriorated since origination. Expert judgement is applied by experienced credit risk officers to classify cases into categories that reflect progressively deteriorating credit risk to RBS. There are two classifications which apply to non-defaulted customers within the framework – Heightened Monitoring and Risk of Credit Loss. For the purposes of provisioning, all exposures subject to the framework are categorised as Stage 2 and subject to a lifetime loss assessment. The framework also applies to those customers that have met RBS's default criteria (AQ10 exposures). Defaulted exposures are categorised as Stage 3 impaired for provisioning purposes.

Heightened Monitoring customers are performing customers that have met certain characteristics, which have led to significant credit deterioration. Collectively, characteristics reflect circumstances that may affect the customer's ability to meet repayment obligations. Characteristics include trading issues, covenant breaches, material PD downgrades and past due facilities.

Heightened Monitoring customers require pre-emptive actions (outside the customer's normal trading patterns) to return or maintain their facilities within RBS's current risk appetite prior to maturity.

Risk of Credit Loss customers are performing customers that have met the criteria for Heightened Monitoring and also pose a risk of credit loss to RBS in the next 12 months (should mitigating action not be taken or not be successful).

Once classified as either Heightened Monitoring or Risk of Credit Loss, a number of mandatory actions are taken in accordance with policies. Actions include a review of the customer's credit grade, facility and security documentation and the valuation of security. Depending on the severity of the financial difficulty and the size of the exposure, the customer relationship strategy is reassessed by credit officers, by specialist credit risk or relationship management units in the relevant business, or by Restructuring.

Agreed customer management strategies are regularly monitored by both the business and credit teams. The largest Risk of Credit Loss exposures are regularly reviewed by a Risk of Credit Loss Committee. The committee members are experienced credit, business and restructuring specialists. The purpose of the committee is to review and challenge the strategies undertaken for customers that pose the largest risk of credit loss to RBS.

Capital and risk management

Credit risk continued

Appropriate corrective action is taken when circumstances emerge that may affect the customer's ability to service its debt (refer to Heightened Monitoring characteristics). Corrective actions may include granting a customer various types of concessions. Any decision to approve a concession will be a function of specific appetite, the credit quality of the customer, the market environment and the loan structure and security. All customers granted forbearance are classified Heightened Monitoring as a minimum.

Other potential outcomes of the relationship review are to: remove the customer from the Risk of Credit Loss framework, offer additional lending and continue monitoring, transfer the relationship to Restructuring if appropriate, or exit the relationship.

The Risk of Credit Loss framework does not apply to problem debt management for Business Banking customers in UK PBB. These customers are, where necessary, managed by specialist problem debt management teams, depending on the size of exposure or by the Business Banking recoveries team where a loan has been impaired.

Restructuring

For the Wholesale problem debt portfolio, customer relationships are mainly managed by the Restructuring team (excluding customers managed by UK PBB). The purpose of Restructuring is to protect RBS's capital. Where practicable, Restructuring does this by working with corporate and commercial customers to support their turnaround and recovery strategies and enable them to return to mainstream banking. Restructuring will always aim to recover capital in a fair and efficient manner.

Specialists in Restructuring work with customers experiencing financial difficulties and showing signs of financial stress. Throughout Restructuring's involvement the mainstream relationship manager will remain an integral part of the customer relationship, unless an exit strategy is deemed appropriate. The objective is to find a mutually acceptable solution, including restructuring of existing facilities, repayment or refinancing.

Where a solvent outcome is not possible, insolvency may be considered as a last resort. However, helping the customer return to financial health and restoring a normal banking relationship is always the preferred outcome.

Forbearance (audited)

Forbearance takes place when a concession is made on the contractual terms of a loan/debt in response to a customer's financial difficulties.

The aim of forbearance is to support and restore the customer to financial health while minimising risk. To ensure that forbearance is appropriate for the needs of the customer, minimum standards are applied when assessing, recording, monitoring and reporting forbearance.

A loan/debt may be forborne more than once, generally where a temporary concession has been granted and circumstances warrant another temporary or permanent revision of the loan's terms.

In the Personal portfolio, loans are considered forborne until they meet the exit criteria set out by the European Banking Authority. These include being classified as performing for two years since the last forbearance event, making regular repayments and the loan/debt being less than 30 days past due. Exit criteria are not currently applied for Wholesale portfolios.

Types of forbearance

Personal

In the Personal portfolio, forbearance may involve payment concessions and loan rescheduling (including extensions in contractual maturity), capitalisation of arrears and, in the Republic of Ireland only, temporary interest-only conversions. Forbearance is granted principally to customers with mortgages and less frequently to customers with unsecured loans. This includes instances where forbearance may be provided to customers with highly flexible mortgages.

Wholesale

In the Wholesale portfolio, forbearance may involve covenant waivers, amendments to margins, payment concessions and loan rescheduling (including extensions in contractual maturity), capitalisation of arrears, and debt forgiveness or debt-for-equity swaps.

Monitoring of forbearance

Personal

For Personal portfolios, forborne loans are separated and regularly monitored and reported while the forbearance strategy is implemented, until they exit forbearance.

Wholesale

In the Wholesale portfolio, customer PDs and facility LGDs are re-assessed prior to finalising any forbearance arrangement. The ultimate outcome of a forbearance strategy is highly dependent on the cooperation of the borrower and a viable business or repayment outcome. Where forbearance is no longer appropriate, RBS will consider other options such as the enforcement of security, insolvency proceedings or both, although these are options of last resort.

Provisioning for forbearance

Personal

The methodology used for provisioning in respect of Personal forborne loans will differ depending on whether the loans are performing or non-performing and which business is managing them due to local market conditions.

Granting forbearance will only change the arrears status of the loan in specific circumstances, which can include capitalisation of principal and interest in arrears, where the loan may be returned to the performing book if the customer has demonstrated an ability to meet regular payments and is likely to continue to do so.

The loan would remain in forbearance for the defined probation period and be subject to performance criteria. These include making regular repayments and being less than 30 days past due.

Additionally for some forbearance types a loan may be transferred to the performing book if a customer makes payments that reduce loan arrears below 90 days (UK PBB collections function).

For ECL provisioning, all forborne but performing exposures are categorised as Stage 2 and are subject to a lifetime loss provisioning assessment.

For non-performing forborne loans, the Stage 3 loss assessment process is the same as for non-forborne loans with the exception of Ulster Bank RoI, where forborne loans which result in an economic loss form a separate risk pool and are subjected to specific provisioning treatments.

Credit risk continued

Wholesale

Provisions for forborne loans are assessed in accordance with normal provisioning policies. The customer's financial position and prospects – as well as the likely effect of the forbearance, including any concessions granted, and revised PD or LGD gradings – are considered in order to establish whether an impairment provision is required.

Wholesale loans granted forbearance are individually assessed in most cases. Performing loans subject to forbearance treatment are categorised as Stage 2 and subject to a lifetime loss assessment.

Forbearance may result in the value of the outstanding debt exceeding the present value of the estimated future cash flows. This difference will lead to a customer being classified as non-performing.

In the case of non-performing forborne loans, an individual loan impairment provision assessment generally takes place prior to forbearance being granted. The amount of the loan impairment provision may change once the terms of the forbearance are known, resulting in an additional provision charge or a release of the provision in the period the forbearance is granted.

The transfer of Wholesale loans from impaired to performing status follows assessment by relationship managers and credit. When no further losses are anticipated and the customer is expected to meet the loan's revised terms, any provision is written-off or released and the balance of the loan returned to performing status. This is not dependent on a specified time period and follows the credit risk manager's assessment.

Impairment, provisioning and write-offs (audited)

In the overall assessment of credit risk, impairment, provisioning and write-offs are used as key indicators of credit quality.

The new IFRS 9 impairment provisions accounting standard was implemented with effect from 1 January 2018. Set out below is further detail regarding the impact of the transition from IAS 39 to IFRS 9 impairment provisioning, how key credit risk management activities link to IFRS 9 impairment provisioning and the key policy and modelling decisions that have been made in implementing IFRS 9 (refer also to Accounting policy 14 and Note 14 on the consolidated accounts).

Transition from IAS 39 to IFRS 9 (audited)

RBS implemented IFRS 9 with effect from 1 January 2018 with no restatement of comparatives other than the Day One impact on implementation reflected in opening equity.

Cash flows and cash losses are unchanged by the change in impairment framework from IAS 39 to IFRS 9. IFRS 9 has changed the basis of loss calculation to expected loss (forward-looking), as opposed to the incurred loss model under IAS 39, which focused only on losses that had already occurred. There are a number of changes as well as judgements involved in measuring ECL. New elements include:

- Move from incurred loss model to expected loss model, including all performing assets having 12-month ECL on origination – £513 million increase in provision partly offset by the IAS 39 latent loss provision of £390 million.
- Determination of significant increase in credit risk – this moves a subset of assets from a 12-month ECL (Stage 1) to lifetime ECL (Stage 2) when credit risk has significantly increased since origination – £356 million increase in provision.
- Change in scope of impaired assets (Stage 3) – £73 million increase in provision primarily reflecting assets that have defaulted but with expectation of full recovery under IAS 39.
- Incorporation of forward-looking information, including multiple economic scenarios (MES). MES are assessed in order to identify non-linearity of losses in the portfolio – £64 million increase in provision.

Key differences in moving from IAS 39 to IFRS 9 on impairment loss (audited)	Total £m
31 December 2017 - IAS 39 impairment provision (1)	3,832
Removal of IAS 39 latent provision	(390)
IFRS 9 12 month ECL on Stage 1 and Stage 2	513
Increase in Stage 2 ECL to lifetime (discounted)	356
Stage 3 loss estimation (EAD and LGD)	73
Impact of MES	64
1 January 2018 - IFRS 9 ECL	4,448

Note:
(1) Includes £3,814 million relating to loans, less £10 million on loans that were carried at fair value and £28 million relating to FVOCI and LAR debt securities.

Key points

- Overall provisions – The overall provisioning requirement under IFRS 9 increased by £616 million – a 16% increase relative to IAS 39. The main driver of the increase was the requirement to hold a minimum of 12 months of ECL on performing assets, increasing to lifetime loss for assets that have exhibited a significant increase in credit risk.
- Performing assets – Compared with the latent loss provision held under IAS 39 of £390 million, the ECL requirement on performing assets (Stage 1 and Stage 2) more than doubled, increasing by £479 million to £869 million.
- Non-performing assets – The IFRS 9 provisioning requirement on non-performing assets in Stage 3 was less affected. The ECL requirement of £3.6 billion was £123 million (4%) higher compared with IAS 39 impaired portfolio provisions of £3.4 billion principally on defaulted assets that did not carry a provision, reflecting the expectation of full recovery under IAS 39.
- UK PBB and Ulster Bank RoI combined – The exposures in these two segments are primarily Personal. The ECL provisioning requirement was £2.8 billion, an uplift of £384 million relative to the IAS 39 provision. This was driven by the higher provisioning requirement on performing assets, principally on the UK credit card portfolio where provisions increased by £122 million (31% of the total increase).
- CPB and NatWest Markets – The assets are mainly Wholesale. The ECL provisioning requirement was £1.6 billion, an uplift of £222 million relative to IAS 39. The uplift in Stage 3 assets of £83 million was principally driven by assets defaulted but with expectation of full recovery under IAS 39.

Credit risk continued

Key elements of IFRS 9 impairment provisions (audited)

IFRS 9 introduced additional complexity into the determination of credit impairment provisioning requirements. However, the building blocks that deliver an ECL calculation already existed in RBS. Existing Basel models were used as a starting point in the construction of IFRS 9 models, which also incorporate term extension and forward-looking information.

Five key areas may materially influence the measurement of credit impairment under IFRS 9 – two of these relate to model build and three relate to their application:

- Model build:
  - The determination of economic indicators that have most influence on credit loss for each portfolio and the severity of impact (this leverages existing stress testing mechanisms).
  - The build of term structures to extend the determination of the risk of loss beyond 12 months that will influence the impact of lifetime loss for assets in Stage 2.
- Model application:
  - The assessment of the significant increase in credit risk and the formation of a framework capable of consistent application.
  - The determination of asset lifetimes that reflect behavioural characteristics while also representing management actions and processes (using historical data and experience).
  - The determination of a base case (or central) economic scenario which has the most material impact (of all forward-looking scenarios) on the measurement of loss (RBS uses consensus forecasts to remove management bias).

Policy elections and simplifications relating to IFRS 9

In addition to the five key areas above, which are relevant from period to period, there was one further significant judgment that was made as a one-off exercise to support the Day One implementation: this was the application of the new IFRS 9 models to the determination of origination date metrics. Since it is not possible to determine the economic forecasts and alternative scenarios going backwards in time it is necessary to use a series of assumptions to enable this process. RBS assumed a flat economic forecast, for all dates historically. There were some other less significant judgments, elections and simplification assumptions that informed the ECL process; these were not seen as 'critical' in determining the appropriate level of impairment but represented choices taken by management across areas of estimation uncertainty. The main examples of these are:

- Models – for example in the case of some low default portfolios, Basel parameter estimates have been applied for IFRS 9.
- Non-modelled portfolios – certain portfolios have their Basel II capital requirement calculated under the standardised framework for regulatory purposes and do not have systematically modelled PDs, EADs and LGDs. Under IFRS 9, they have bespoke treatments for the identification of significant increase in credit risk and ECL provisions. With respect to the latter, benchmark PDs, EADs and LGDs are used with the benchmarks being reviewed annually for appropriateness. The main non-modelled portfolios are Private Banking, RBSI personal and Lombard.
- Discounting of future losses – the ECL calculation is based on expected future cash-flows. These are discounted using the effective interest rate – for practical purposes, this is typically applied at a portfolio level rather than being established and operated at an individual asset level.
- Multiple economic scenarios (MES) – it is the selection of the central (or base) scenario that is most critical to the ECL calculation, independent of the method used to generate a range of alternative outcomes and their probabilities. Different approaches to model MES around the central scenario have all been found of low significance for the overall ECL impact.

Economic loss drivers

Introduction (audited)

The portfolio segmentation and selection of economic loss drivers for IFRS 9 follow closely the approach already used in stress testing. To enable robust modelling the forecasting models for each portfolio segment (defined by asset class and where relevant – industry sector and region) are based on a selected, small number of economic factors, (typically two to four) that best explain the temporal variations in portfolio loss rates. The process to select economic loss drivers involves empirical analysis and expert judgment.

The most material primary economic loss drivers for Personal portfolios include national GDP, unemployment rate, House Price Index, and base rate for UK and Irish portfolios as relevant. In addition to some of these loss drivers, for Wholesale portfolios, world GDP is a primary loss driver.

Central base case economic scenario (audited)

The internal base case scenario is the primary forward-looking economic information driving the calculation of ECL The same base case scenario is used for RBS's financial planning. The key elements of the current economic base case, which includes forecasts over a five year forecast horizon, are summarised as follows:

- United Kingdom – The central scenario projects modest growth in the UK economy, in line with the consensus outlook. Brexit related uncertainty results in subdued confidence in the near term, placing it in the lower quartile of advanced economies. Business investment is weak at the start of the forecast, improving only gradually. Consumer spending rises steadily as households benefit from falling inflation and rising wage growth, though it is a modest upturn. The central scenario assumes slower job growth than seen in recent years, meaning unemployment edges up from its current historic lows. House price growth slows, extending the current slowdown, before picking up to low single digit growth in later years. Monetary policy follows the market implied path for Bank of England base rate at the time the scenarios were set, therefore it is assumed only two further base rate increases over the next five years.
- Republic of Ireland – The economy is expected to continue on its positive trajectory with growth expected to revert closer to long run averages in the medium term. Job growth is expected to moderate with the unemployment remaining around 5%. Meanwhile house price growth continues to moderate to a low single-digit pace. As always, a small open economy such as RoI remains very sensitive to the global economic environment and expectations can change at short notice.

Use of the central base case in Personal

In Personal the internal base case is directly used as the central scenario for the ECL calculations by feeding the forecasted economic loss drivers into the respective PD and LGD models

Use of the central base case in Wholesale

As in Personal the primary input is the central base case scenario but a further adjustment is applied to explicitly enforce a gradual reversion to long run average credit cycle conditions from the first projected year onwards.

This adjustment process leverages the existing Wholesale credit models framework that utilises Credit Cycle Indices (CCI) to measure the point-in-time default rate conditions in a comprehensive set of region/industry groupings. The CCI are constructed by summarising market data based point-in-time PDs for all publicly listed entities in the respective region/industry grouping on a monthly frequency. Positive CCI values indicate better than average conditions, i.e. low default rates and a CCI value of zero indicates default rate conditions at long run average levels. The CCI can be interpreted as an aggregation of the primary economic loss drivers most relevant for each portfolio segment into a single measure. The central base case scenario forecasts provided at the level of economic loss drivers are fed into the ECL calculations by first translating them into corresponding CCI forecasts for each portfolio segment and subsequently applying the aforementioned mean-reversion adjustment.

Capital and risk management

Credit risk continued

Initially at transition, mean reversion was applied from year five onwards. Since H1 2018, mean reversion is applied from the first year onwards. The earlier application of the mean reversion adjustment was introduced to account for two empirical observations. Firstly historic credit loss rates in Wholesale portfolios show pronounced mean reversion behaviour and secondly, the accuracy of economic forecasts tends to drop significantly for horizons beyond one or two years.

Approach for MES (audited)

The response of portfolio loss rates to changes in economic conditions is typically non-linear and asymmetric. Therefore in order to appropriately take account of the uncertainty in economic forecasts a range of MES are considered when calculating ECL.

- Personal – the approach to MES is based on using a set of discrete scenarios. In addition to the central base case a further four bespoke scenarios are taken into account – a base case upside and downside – and an additional upside and downside. The overall MES ECL is calculated as a probability weighted average across all five scenarios. (Refer to the Probability weightings of scenarios section below).

The ECL impact on the Personal portfolio arising from the application of MES over the single, central base case is relatively low, and following review by the Provisions Committee, overlays were agreed to ensure the expected effect of non-linearity of losses was appropriately recognised. As at 31 December 2018, the value of the overlays was £26 million for UK PBB and £26 million for Ulster Bank RoI.

- Wholesale – the approach to MES is a Monte Carlo method that involves simulating a large number of alternative scenarios around the central scenario (adjusted for mean reversion) and averaging the losses and PD values for each individual scenario into unbiased expectations of losses (ECL) and PD.

The simulation of alternative scenarios does not occur on the level of the individual economic loss drivers but operates on the aggregate CCI described earlier. Since the existing Wholesale credit models for PD and LGD were already built within the CCI framework the chosen Monte Carlo method provided a conceptually rigorous but still efficient approach to implement the MES requirement.

The Monte Carlo MES approach increases Wholesale ECL for Stage 1 and Stage 2 by approximately 5% above the single, central scenario outcomes. No additional MES overlay was applied for Wholesale.

For both Personal and Wholesale, the impact from MES is factored in to account level PDs through scalars. These MES-adjusted PDs are used to assess whether a significant increase in credit risk has occurred.

Key economic loss drivers – average over the five year planning horizon (2019 to 2023 for 31 December 2018 and 2018 to 2022 for 1 January 2018) – in the most relevant planning cycle for the central base case and two upside and downside scenarios used for ECL modelling are set out below.

Economic parameters

	31 December 2018					1 January 2018				
	Upside 2	Upside 1	Base case	Downside 1	Downside 2	Upside 2	Upside 1	Base case	Downside 1	Downside 2
UK	%	%	%	%	%	%	%	%	%	%
GDP - change	2.6	2.3	1.7	1.5	1.1	2.2	1.9	1.7	1.5	1.3
Unemployment	3.3	3.8	5.0	5.6	6.9	5.0	5.2	5.3	5.4	5.5
House Price Inflation - change	4.3	3.3	1.7	1.1	(0.5)	4.2	3.4	3.1	2.9	2.7
Bank of England base rate	1.7	1.3	1.1	0.5	—	1.7	1.2	0.8	0.4	0.2
Republic of Ireland										
GDP - change	4.3	3.6	3.0	3.1	2.8	3.6	3.2	2.9	2.6	2.3
Unemployment	4.2	4.6	5.2	6.0	6.8	5.0	5.4	5.7	5.9	6.1
House Price Inflation - change	9.2	6.8	4.0	3.2	0.8	6.7	5.4	4.4	3.7	3.0
European Central Bank base rate	1.3	0.8	0.3	—	—	0.6	0.4	0.1	0.1	—
World GDP - change	3.6	3.2	2.7	2.5	2.3	2.9	2.7	2.6	2.5	2.4
Probability weight	12.8	17.0	30.0	25.6	14.6	5.0	15.0	60.0	15.0	5.0

Probability weightings of scenarios (audited)

RBS's approach to IFRS 9 MES in Personal involves selecting a suitable set of discrete scenarios to characterise the distribution of risks in the economic outlook and assigning appropriate probability weights to those scenarios. This has the following basic steps:

- Scenario selection – for 2018 two upside and two downside scenarios from Moody's inventory of scenarios were chosen. The aim is to obtain downside scenarios that are not as severe as stress tests, so typically have a severity of around one in ten and one in five of approximate likelihood, along with corresponding upsides.
- Severity assessment – having selected the most appropriate scenarios their severity is then assessed based on the behaviour of UK GDP by calculating a variety of measures such as average GDP growth deviation from base and peak to trough falls in GDP. These measures are compared against a set of 1,000 model runs and it is established what percentile in the distribution most closely corresponds with each scenario.
- Probability assignment – having established the relevant percentile points, probability weights are assigned to ensure that the scenarios produce an unbiased result. If the severity assessment step shows the scenarios to be broadly symmetric, then this will result in a symmetric probability weighting (same probability weight above and below the base case, as was used in the first half of 2018). However if the downsides are not as extreme as the upsides, then more probability weight is allocated to the downsides to ensure the unbiasedness requirement is satisfied (as was the case in the second half of 2018). This adjustment is made purely to restore unbiasedness, not to address any relative skew in the distribution of risks in the economic outlook, which is dealt with through overlays and covered in the section on UK economic uncertainty.

Credit risk continued

UK economic uncertainty (audited)

RBS's 2018 results were prepared during the run up to the UK leaving the European Union, a period of elevated uncertainty over the UK economic outlook. RBS's approach to capturing that elevated uncertainty is to apply an overlay to ECL. Information is used from the earnings volatility scenario that is part of the 2018 planning process and credit risk appetite setting. Key elements include an alternative path the economy could take, being characterised as more severe than the Bank of England's "Disruptive Brexit" scenario (ACS) but less severe than the "Disorderly Brexit" scenario and then applying management judgement as to its likelihood. The RBS-wide overlay of £101 million booked in the third quarter of 2018 remained in place at the year end.

IFRS 9 credit risk modelling (audited)

IFRS 9 introduced lifetime ECL for the measurement of credit impairment. This required the development of new models or the enhancement of existing Basel models. IFRS 9 ECLs are calculated using a combination of:

- Probability of default.
- Loss given default.
- Exposure at default.

In addition, lifetime PDs (as at reporting date and at date of initial recognition) are used in the assessment of a significant increase in credit risk (SICR) criteria.

IFRS 9 ECL model design principles

To meet IFRS 9 requirements for ECL estimation, PD, LGD and EAD used in the calculations must be:

- Unbiased – material regulatory conservatism has been removed to produce unbiased model estimates.
- Point-in-time – recognise current economic conditions.
- Forward-looking – incorporated into PD estimates and, where appropriate, EAD and LGD estimates.
- For the life of the loan – all models produce a term structure to allow a lifetime calculation for assets in Stage 2 and Stage 3.

IFRS 9 requires that at each reporting date, an entity shall assess whether the credit risk on an account has increased significantly since initial recognition. Part of this assessment requires a comparison to be made between the current lifetime PD (i.e. the current probability of default over the remaining lifetime) with the equivalent lifetime PD as determined at the date of initial recognition.

For assets originated before IFRS 9 was introduced, comparable lifetime origination PDs did not exist. These have been retrospectively created using the relevant model inputs applicable at initial recognition. Due to data availability, two practical measures have been taken:

- Where model inputs were not available at the point of initial recognition the earliest available robust metrics were used. For instance, since Basel II was introduced in 2008, the earliest available and reliable production Basel PDs range from between December 2007 and April 2008 depending on the portfolio.
- Economic conditions at the date of initial recognition have been assumed to remain constant from that point forward.

PD estimates

Personal models

Personal PD models use an Exogenous, Maturity and Vintage (EMV) approach to model default rates by taking into account EMV effects. The EMV approach separates portfolio default risk trends into three components: vintage effects (quality of new business over time), maturity effects (changes in risk relating to time on book) and exogenous effects (changes in risk relating to changes in macro economic conditions). This EMV methodology has been widely adopted across the industry because it enables forward-looking information to be modelled separately by isolating exogenous or macroeconomic effects. Forward-looking information is incorporated by fitting an appropriate macroeconomic model, such as the relevant stress testing model to the exogenous component and utilising forecasts of the relevant macro-economic factors.

Wholesale models

Wholesale PD models use the existing CCI based point-in-time/through-the-cycle framework to convert one-year regulatory PDs into point-in-time estimates that reflect current economic conditions across a comprehensive set of region/industry segments.

One year point-in-time PDs are then extrapolated to multi-year PDs using a conditional transition matrix approach. The conditional transition matrix approach allows the incorporation of forward-looking information, provided in the form of yearly CCI projections, by adjusting the credit state transition probabilities according to projected, forward-looking changes of credit conditions in each region/industry segment.

This results in forward-looking point-in-time PD term structures for each obligor from which the lifetime PD for a specific exposure can be calculated according to the exposure's residual contractual maturity.

LGD estimates

The general approach for the IFRS 9 LGD models was to leverage the Basel LGD models with bespoke IFRS 9 adjustments to ensure unbiased estimates, that is, the use of effective interest rate as the discount rate and the removal of downturn calibration, indirect costs, other conservatism and regulatory floors.

Personal

Forward-looking information has only been incorporated for the secured portfolios, where changes in property prices can be readily accommodated. Analysis has indicated minimal impact for the other Personal portfolios. For UBIDAC, a bespoke IFRS 9 LGD model is used, reflecting its specific regional market.

Wholesale

Current and forward-looking economic information is incorporated into the LGD estimates using the existing CCI framework. For low default portfolios (for example, sovereigns) loss data is too scarce to substantiate estimates that vary with systematic conditions. Consequently, for these portfolios, LGD estimates are assumed to be constant throughout the projection horizon.

EAD estimates

Retail

The IFRS 9 Personal modelling approach for EAD is dependent on product type.

- Revolving products use the existing Basel models as a basis, with appropriate adjustments incorporating a term structure based on time to default.
- Amortising products use an amortising schedule, where a formula is used to calculate the expected balance based on remaining terms and interest rates.
- There is no EAD model for Personal loans. Instead, debt flow (i.e. combined PD x EAD) is directly modelled.

Analysis has indicated that there is minimal impact on EAD arising from changes in the economy for all Retail portfolios except mortgages. Therefore, forward-looking information is only incorporated in the mortgage EAD model (through forecast changes in interest rates).

Wholesale

For Wholesale, EAD values are estimated on the basis of credit conversion factor (CCF) models. RBS have observed historic, realised CCF values to vary over time but there is no clear relationship between the temporal changes in CCF and economic conditions. RBS attribute changes in CCFs to changes in exposure management practices.

Therefore RBS does not include forward-looking economic information into projected CCF/EAD. To ensure CCF values reflect most recent exposure management practices, RBS update CCF coefficients in the model frequently (typically annually) using the last five years of observed data.

Credit risk continued

Governance and post model adjustments

The IFRS 9 PD, EAD and LGD models are subject to RBS's model monitoring and governance frameworks, which include approving post model adjustments (PMAs) calculated to incorporate the most recent data available and made on a temporary basis ahead of the underlying model parameter changes being implemented. These PMAs totalled approximately £60 million at the year end primarily in respect of PD under-predictions. In addition, as at 31 December 2018, judgemental ECL overlays on the UK PBB mortgage portfolio totalled £30 million, including £15 million in respect of the repayment risk not captured in the models that a proportion of customers on interest only mortgages will not be able to repay the capital element of their loan at end of term. The overlay for interest only mortgages was based on an analysis of recent experience on customer repayments pre and post end of term, and modelling that forward for maturities over the next ten years. These adjustments were over and above those covering economic uncertainty and non-linearity of losses discussed above and are also subject to over-sight and governance by the Provisions Committee.

Significant increase in credit risk (audited)

Exposures that are considered significantly credit deteriorated since initial recognition are classified in Stage 2 and assessed for lifetime ECL measurement (exposures not considered deteriorated carry a 12 month ECL). RBS has adopted a framework to identify deterioration based primarily on movements in probability of default supported by additional backstops. The principles applied are consistent across RBS and align to credit risk management practices.

The framework comprises the following elements:

- IFRS 9 lifetime PD assessment (the primary driver) – on modelled portfolios the assessment is based on the relative deterioration in forward-looking lifetime PD and is assessed monthly. To assess whether credit deterioration has occurred, the residual lifetime PD at balance sheet date (which PD is established at date of initial recognition (DOIR)) is compared to the current PD. If the current lifetime PD exceeds the residual origination PD by more than a threshold amount deterioration is assumed to have occurred and the exposure transferred to Stage 2 for a lifetime loss assessment. For Wholesale, a doubling of PD would indicate a significant increase in credit risk subject to a minimum PD uplift of 0.1%. For Personal portfolios, the criteria varies by risk band, with lower risk exposures needing to deteriorate more than higher risk exposures, as outlined in the following table:

Personal risk bands	Risk bandings (based on residual lifetime PD calculated at DOIR)	PD deterioration threshold criteria
Risk band A	<0.762%	PD@DOIR + 1%
Risk band B	<4.306%	PD@DOIR + 3%
Risk band C	>=4.306%	1.7 x PD@DOIR

- Qualitative high-risk backstops – the PD assessment is complemented with the use of qualitative high-risk backstops to further inform whether significant deterioration in lifetime risk of default has occurred. The qualitative high-risk backstop assessment includes the use of the mandatory 30+ days past due backstop, as prescribed by IFRS 9 guidance, and other features such as forbearance support, Wholesale exposures managed within the Risk of Credit Loss framework, and for Personal, adverse credit bureau results.
- Persistence (Personal and Business Banking only) – the persistence rule ensures that accounts which have met the criteria for PD driven deterioration are still considered to be significantly deteriorated for three months thereafter. This additional rule enhances the timeliness of capture in Stage 2. It is a Personal methodology feature and is applied to PD driven deterioration only.

The criteria are based on a significant amount of empirical analysis and seek to meet three key objectives:

- Criteria effectiveness – the criteria should be effective in identifying significant credit deterioration and prospective default population.
- Stage 2 stability – the criteria should not introduce unnecessary volatility in the Stage 2 population.
- Portfolio analysis – the criteria should produce results which are intuitive when reported as part of the wider credit portfolio.

Asset lifetimes (audited)

The choice of initial recognition and asset duration is another critical judgement in determining the quantum of lifetime losses that apply.

- The date of initial recognition reflects the date that a transaction (or account) was first recognised on the balance sheet; the PD recorded at that time provides the baseline used for subsequent determination of SICR.
- For asset duration, the approach applied (in line with IFRS 9 requirements) is:
  - Term lending – the contractual maturity date, reduced for behavioural trends where appropriate (such as, expected pre-payment and amortisation).
  - Revolving facilities – for Personal portfolios (except credit cards), asset duration is based on behavioural life and this is normally greater than contractual life (which would typically be overnight). For Wholesale portfolios, asset duration is based on annual counterparty review schedules and will be set to the next review date.

In the case of credit cards, the most significant judgement is to reflect the operational practice of card reissuance and the associated credit assessment as enabling a formal re-origination trigger. As a consequence a capped lifetime approach of up to 36 months is used on credit card balances. If the approach was uncapped the ECL impact is estimated at less than £90 million, compared to £75 million at transition, with the increase primarily reflecting refinements to criteria used to identify a significant increase in credit risk during the year.

The approach reflects RBS practice of a credit-based review of customers prior to credit card issuance and complies with IFRS 9. Benchmarking information indicates that peer UK banks use behavioural approaches in the main for credit card portfolios with average durations between three and ten years. Across Europe durations are shorter and are, in some cases, as low as one year.

Measurement uncertainty and ECL sensitivity analysis (audited)

The recognition and measurement of ECL is highly complex and involves the use of significant judgement and estimation. This includes the formulation and incorporation of multiple forward-looking economic conditions into ECL to meet the measurement objective of IFRS 9. The ECL provision is sensitive to the model inputs and economic assumptions underlying the estimate. Set out below is the impact of some of the material sensitivities considered for 2018 year end reporting. These ECL simulations are separate to the impact arising from MES as described earlier in this disclosure, which impacts are embedded in the reported ECL. Given the current benign environment for impairments the focus is on downsides to the existing ECL provision levels.

The focus of the simulations is on ECL provisioning requirements on performing exposures in Stage 1 and Stage 2. The simulations are run on a stand-alone basis and are independent of each other; the potential ECL uplifts reflect the simulated impact as at the year end balance sheet date. As default is an observed event as at the balance sheet date, Stage 3 provisions are not subject to the same level of measurement uncertainty, and therefore have not been considered in this analysis. The following common scenarios have been applied across the key Personal and Wholesale portfolios:

Credit risk continued

- Economic uncertainty – simulating the impact arising from the Downside 2 scenario, which is one of the five discrete scenarios used in the methodology for Personal MES. In the simulation RBS have assumed that the economic macro variables associated with the Downside 2 scenario replace the existing base case economic assumptions, giving them a 100% probability weighting for Personal and using the Monte Carlo approach in Wholesale to simulate the impact of MES around the base case economic scenario.
- As reflected in the economic metrics in the following table, the Downside 2 scenario assumes a significant economic downturn in the UK in 2019 running in to 2020 with recovery in the later years. UK GDP turns negative in 2019 compared to the base case assumption of continued growth, unemployment increases and peaks at the end of 2020. House prices fall in both 2019 and 2020 before starting to recover, and interest rates are assumed to be lower for longer. An economic slowdown is also assumed in the Republic of Ireland in 2019 and 2020.

	Base case economic parameters					Downside 2 economic parameters				
	2019 Q4	2020 Q4	2021 Q4	2022 Q4	2023 Q4	2019 Q4	2020 Q4	2021 Q4	2022 Q4	2023 Q4
UK	%	%	%	%	%	%	%	%	%	%
GDP (year-on-year)	1.7	1.5	1.9	1.8	1.8	(1.2)	1.2	2.7	2.0	2.1
Unemployment rate	4.8	5.0	5.1	5.1	5.1	6.7	7.4	7.3	6.9	6.4
House Price Inflation (year-on-year)	1.1	0.7	1.5	2.3	3.4	(7.0)	(4.5)	1.0	4.1	6.3
Bank of England rate	1.0	1.0	1.3	1.3	1.3	—	—	—	—	—
Republic of Ireland										
GDP (year-on-year)	4.2	2.9	2.8	2.8	2.5	0.7	3.5	4.4	4.5	4.0
Unemployment rate	5.2	5.1	5.1	5.2	5.3	7.6	7.7	6.5	5.9	5.7
House Price Inflation (year-on-year)	5.8	2.7	3.0	3.4	3.5	(6.7)	(5.4)	2.2	7.2	8.8
European Central Bank rate	—	—	0.3	0.5	0.8	—	—	—	—	—
World GDP (year-on-year)	2.7	2.4	2.9	2.7	2.5	(0.8)	3.1	4.4	3.2	2.8

This scenario has been applied to all modelled portfolios in the analysis below, with the simulation impacting both PDs and LGDs. For some portfolios this creates a significant impact on ECL, for others less so but on balance the impact is deemed reasonable. In this simulation, it is assumed the existing modelled relationship between key economic variables and loss drivers holds good.

- Portfolio risk – evaluation of the impact of a movement in one of the key metrics, PD, simulating a relative 25% upward shift in PDs.

These common scenarios were complemented with two specific portfolio simulations:

- Wholesale portfolios – simulating the impact of PDs moving upwards to the through-the-cycle (TTC) average from their current point-in-time (PIT) estimate. This simulation looks solely at PD movements, potential movements in LGD rates have not been considered. With the current benign economic conditions wholesale IFRS 9 PIT PDs are significantly lower than TTC PD. This scenario shows the increase to ECL by immediately switching to TTC PDs providing an indication of long run average expectations. IFRS 9 PDs have been used so there remains some differences to Basel TTC PDs where conservative assumptions are required, such as caps or floors, not permitted under the IFRS 9 best estimate approach.
- Mortgages – House Price Inflation (HPI) is a key economic driver and RBS have simulated a univariate scenario of a 5% decrease in HPI across the main mortgage portfolios. A univariate analysis using only HPI does not allow for the interdependence across the other key primary loss drivers to be reflected in any ECL estimate. The simulated impact is based on 100% probability weighting to demonstrate the sensitivity of HPI on the central base case. The Downside 2 scenario above has house prices falling by a more material amount, and also includes the impact of PD increases which are not captured under the HPI univariate simulation.

RBS's core criterion to identify a significant increase in credit risk is founded on PD deterioration, as discussed above. Under the simulations, PDs increase and result in exposures moving from Stage 1 to Stage 2 contributing to the ECL uplift.

Credit risk continued

Economic sensitivity analysis

	Actual position at 31 December 2018			Common scenarios (3)						Discrete scenarios (3)		
	Stage 1 and Stage 2 (1)			Downside 2			25% PD increase					
	Exposure	of which in Stage 2	ECL provision(2)	Potential ECL uplift		Exposure in Stage 2	Potential ECL uplift		Exposure in Stage 2	HPI (4)/TTC PD (5) potential ECL uplift		Exposure in Stage 2
	£bn	%	£m	£m	%	%	£m	%	%	£m	%	%
UK PBB	155.7	9.1	589.3	186.4	31.6	11.5	174.2	29.6	10.5			
Of which: mortgages	*137.7*	*7.3*	*80.9*	—	—	—	—	—	—	*5.5*	*6.8*	*7.3*
Ulster Bank RoI Personal and business banking	12.8	11.9	100.0	60.5	60.5	24.5	24.4	24.4	17.3			
Of which: mortgages	*12.2*	*11.4*	*85.5*	—	—	—	—	—	—	*6.1*	*7.2*	*11.7*
Wholesale	261.7	4.1	333.5	79.2	23.8	8.1	86.4	25.9	5.2	106.3	31.9	7.5
Total	430.2	6.1	1,022.8	326.1	31.9	9.8	285.0	27.9	7.5			

Notes:
(1) Reflects drawn exposure and ECL for all modelled exposure in scope for IFRS 9; in addition to loans this includes bonds, and cash. For Personal exposures, this includes UK PBB including business banking, and also Ulster Bank RoI personal and business banking, the analysis excludes Personal exposures such as Private Banking and RBSI.
(2) The ECL provision includes the ECL overlay taken in quarter 3 to recognise the elevated economic uncertainty in the UK in the period running up to the UK leaving the European Union.
(3) All simulations are run on a stand-alone basis and are independent of each other, with the potential ECL uplift reflecting the simulated impact at the year end balance sheet date.
(4) HPI is applied to the most material mortgage portfolios only, UK PBB and Ulster Bank RoI.
(5) TTC or long-run average PDs are applied to Wholesale portfolios only, excluding business banking exposures in PBB, the impact on which is included within the PBB portfolio for this analysis.

Key points

- In the downside 2 scenario, the ECL requirement overall was simulated to increase by £326 million on stage 1 and 2 exposures from the current level of £1,023 million. The simulation estimates the balance sheet ECL requirement as at 31 December 2018 and assumes that the economic variables associated with the Downside 2 scenario had been RBS's base case economic assumption at that time.
- For the UK PBB franchise, the simulated ECL uplift observed in the Downside 2 scenario was a little higher than under the 25% PD increase, with similar seen in the percentage of exposures simulated to move to Stage 2.
- In the Downside 2 scenario, the Ulster Bank RoI simulated uplift was more marked than on the other simulations reflecting the weight of mortgage assets in their personal lending portfolio, with the adverse movement in house prices increasing the LGD. A similar affect was observed on the UK PBB mortgage portfolio where the mortgage ECL was simulated to increase by just over 50%, and which impact is included within the overall PBB simulated result. The percentage of exposures simulated to move into Stage 2 in the Downside 2 scenario is notably higher than under the 25% PD increase for the Ulster Bank RoI due to the combined impact of the macro-economic variables utilised for the simulation.
- On the univariate HPI scenario, the impact of a 5% fall in house prices was relatively modest, the simulated impact was similar in both UK PBB and Ulster Bank RoI. The relationship between the required ECL and house price movements is expected to be non-linear should the level of house prices reduce by more material amounts, with the rate of loss accelerating when prices fall by more than 10%. Ulster Bank RoI also observed a modest increase in the percentage of exposures in Stage 2 reflecting small PD movements, whereas the UK PBB simulation was restricted to the LGD effect alone hence the percentage of assets in Stage 2 remained unchanged.
- Wholesale, the TTC PD scenario has the most significant impact on ECL highlighting that reverting to long run average PDs is more severe than a 25% increase in PDs or a switch to a downside scenario. Moving to TTC PDs requires an average PD uplift of almost 40%.
- The TTC PD and 25% PD increase scenarios see a significant ECL uplift in the property portfolio which is not observed under the Downside 2 scenario as under the Downside 2 scenario the Wholesale PDs begin to revert to long run averages (mean reversion) after 12 months so do not fully capture the further deterioration expected in the property portfolio in years 2 and 3.
- Downside 2 scenario results in more corporate exposure moving to Stage 2 than either the TTC PD or 25% PD increase scenarios. The impact is more concentrated on shorter dated exposure, reflecting the year 1 downturn, which has less of an impact on total ECL.

Credit risk – Banking activities

All the disclosures in this section are audited with the exception of Stage 2 analysis and Stage 3 vintage analysis.

Introduction

This section covers the credit risk profile of RBS's banking activities. Exposures and credit risk measures presented as of and for year ended 31 December 2018 and at 1 January 2018 are on an IFRS 9 basis. Exposures and credit risk measures as of and for the year ended 31 December 2017 are on an IAS 39 basis.

Refer to Accounting policy 14 and Note 14 on the consolidated accounts for revisions to policies and critical judgements relating to impairment loss determination.

Banking activities include a small number of portfolios that were carried at fair value, the most significant of which was the lender-option/buyer-option portfolio of £0.5 billion (1 January 2018 – £2.0 billion). The decrease in the portfolio reflected disposals and valuation changes.

Financial instruments within the scope of the IFRS 9 ECL framework (audited)

Refer to Note 11 on the consolidated accounts for balance sheet analysis of financial assets that are classified as amortised cost (AC) or fair value through other comprehensive income (FVOCI), the starting point for IFRS 9 ECL framework assessment.

Financial assets

Of the total third party £471 billion AC and FVOCI balance (gross of ECL), £463.9 billion or 98% was within the scope of the IFRS 9 ECL framework and comprised by stage: Stage 1 £430.1 billion; Stage 2 £26.1 billion and Stage 3 £7.7 billion (1 January 2018 – £468.8 billion of which Stage 1 £430.5 billion; Stage 2 £27.0 billion and Stage 3 £11.3 billion). Total assets within IFRS 9 ECL scope comprised the following by balance sheet caption and stage:

- Loans: £319.8 billion of which Stage 1 £286.0 billion; Stage 2 £26.1 billion and Stage 3 £7.7 billion (1 January 2018 – £321.3 billion of which Stage 1 £283.3 billion; Stage 2 £26.8 billion and Stage 3 £11.2 billion).
- Other financial assets: £144.1 billion of which Stage 1 £144.1 billion; Stage 2 nil and Stage 3 nil (1 January 2018 – £147.4 billion of which Stage 1 £147.2 billion; Stage 2 £0.2 billion and Stage 3 nil).

Those assets outside the IFRS 9 ECL framework were as follows:

- Settlement balances, items in the course of collection, cash balances and other non-credit risk assets of £4.9 billion. These were assessed as having no ECL unless there was evidence that they were credit impaired.
- Equity shares of £0.5 billion as not within the IFRS 9 ECL framework by definition.
- Fair value adjustments on loans hedged by interest rate swaps, where the underlying loan was within the IFRS 9 ECL scope – £0.9 billion.
- Group-originated securitisations, where ECL was captured on the underlying loans of £0.4 billion.
- Commercial cards which operate in a similar manner to charge cards, with balances repaid monthly via mandated direct debit with the underlying risk of loss captured within the customer's linked current account of £0.4 billion.

Contingent liabilities and commitments

In addition to contingent liabilities and commitments disclosed in Note 27 on the consolidated accounts – reputationally-committed limits, are also included in the scope of the IFRS 9 ECL framework. These are offset by £3.6 billion out of scope balances primarily related to facilities that, if drawn, would not be classified as AC or FVOCI, or undrawn limits relating to financial assets exclusions. Total contingent liabilities (including financial guarantees) and commitments within IFRS 9 ECL scope of £168.9 billion comprised Stage 1 £161.4 billion; Stage 2 £6.9 billion and Stage 3 £0.6 billion.

Capital and risk management

Credit risk – Banking activities continued

Portfolio summary – segment analysis (audited)

The table below summarises gross loans and ECL, by segment and stage, within the scope of the IFRS 9 ECL framework.

31 December 2018 (1)	UK PBB £m	Ulster Bank RoI £m	Commercial Banking £m	Private Banking £m	RBSI £m	NWM £m	Central items & other £m	Total £m
Loans - amortised cost								
Stage 1	146,764	17,822	79,106	13,750	13,383	8,196	6,964	285,985
Stage 2	14,954	2,080	7,809	531	289	407	27	26,097
Stage 3	2,220	2,308	2,136	225	101	728	—	7,718
	163,938	22,210	89,051	14,506	13,773	9,331	6,991	319,800
ECL provisions (2)								
Stage 1	131	35	94	13	6	6	—	285
Stage 2	488	114	136	10	3	12	—	763
Stage 3	796	638	743	20	17	106	—	2,320
	1,415	787	973	43	26	124	—	3,368
ECL provisions coverage (3)								
Stage 1 (%)	0.09	0.20	0.12	0.09	0.04	0.07	—	0.10
Stage 2 (%)	3.26	5.48	1.74	1.88	1.04	2.95	—	2.92
Stage 3 (%)	35.86	27.64	34.78	8.89	16.83	14.56	—	30.06
	0.86	3.54	1.09	0.30	0.19	1.33	—	1.05
Impairment losses								
ECL charge (4)	342	15	144	(6)	(2)	(92)	(3)	398
ECL loss rate - annualised (basis points)	20.86	6.75	16.17	(4.14)	(1.45)	(98.60)	(4.29)	12.45
Amounts written-off	557	372	460	7	9	89	—	1,494

1 January 2018 (1)	UK PBB £m	Ulster Bank RoI £m	Commercial Banking £m	Private Banking £m	RBSI £m	NWM £m	Central items & other £m	Total £m	Balances at central banks £m	Total £m
Financial assets										
Stage 1	145,650	19,055	84,393	12,755	7,791	11,762	52,523	333,929	96,566	430,495
Stage 2	14,490	2,347	8,490	333	307	995	10	26,972	5	26,977
Stage 3	3,202	3,669	3,468	324	119	501	—	11,283	—	11,283
	163,342	25,071	96,351	13,412	8,217	13,258	52,533	372,184	96,571	468,755
ECL provisions (2)										
Stage 1	144	29	58	18	5	2	5	261	1	262
Stage 2	352	106	106	9	5	42	1	621	—	621
Stage 3	1,110	1,054	1,156	27	28	190	—	3,565	—	3,565
	1,606	1,189	1,320	54	38	234	6	4,447	1	4,448
ECL provisions coverage (3)										
Stage 1 (%)	0.1	0.1	0.1	0.1	0.1	—	—	0.1	—	0.1
Stage 2 (%)	2.4	4.5	1.2	2.7	1.6	4.2	10.0	2.3	—	2.3
Stage 3 (%)	34.7	28.7	33.3	8.3	23.5	37.9	—	31.6	—	31.6
	1.0	4.7	1.4	0.4	0.5	1.8	—	1.2	—	0.9

Notes:
(1) The segment analysis tables as at 31 December 2018 include all loans – amortised cost within the scope of IFRS 9. The comparative tables at 1 January 2018 include all financial assets within the scope of IFRS 9, including debt securities of £50.4 billion, of which £42.7 billion related to debt securities classified as FVOCI. ECL on these debt securities at 1 January 2018 was £28 million, of which £4 million related to those classified as FVOCI.
(2) ECL provisions are provisions on loan assets only. Other ECL provisions not included, relate to cash, debt securities and contingent liabilities, and amount to £28 million, of which £5 million was FVOCI.
(3) ECL provisions coverage is ECL provisions divided by loans – amortised cost.
(4) ECL charge balances in the above table include a £3 million charge related to other financial assets, of which a £1 million charge related to assets at FVOCI; and a £31 million release related to contingent liabilities.

The table below shows gross loans (excluding reverse repos) and related credit metrics by segment on an IAS 39 basis.

2017	UK PBB £m	Ulster Bank RoI £m	Commercial Banking £m	Private Banking £m	RBSI £m	NWM £m	Central items & other £m	Total £m
Gross loans to banks	500	2,447	697	109	29	7,490	4,992	16,264
Gross loans to customers	162,957	20,623	98,182	13,514	8,743	22,902	77	321,633
Risk elements in lending (REIL)	1,975	3,282	3,196	95	103	253	—	8,904
Provisions	1,280	1,131	1,162	32	35	174	—	3,814
REIL as a % of gross loans to customers	1.2	15.9	3.3	0.7	1.2	1.1	—	2.7
Provisions as a % of REIL	65	34	36	34	34	69	—	43
Provisions as a % of gross loans to customers	0.8	5.5	1.2	0.2	0.4	0.8	—	1.2
Impairment losses/(releases)	235	60	362	6	3	(137)	1	530
Amounts written-off	572	124	335	4	6	167	2	1,210

Credit risk – Banking activities continued

Portfolio summary – segment analysis (audited)

Key points

- Total ECL provisions have reduced since transition as a result of reduced provisioning requirements on Stage 3 impaired assets, which reflected ongoing write-offs and debt sales, partially offset by increases in Stage 1 and Stage 2.
- Stage 3 ECL provisions – The reductions in the UK PBB business reflected a combination of business-as-usual write-offs and debt sale activity. For Ulster Bank RoI the significant reduction since transition was due to the sale of legacy impaired mortgage portfolio debt. In Commercial Banking and NatWest Markets the reductions were mainly attributable to write-offs.
- Stage 1 and Stage 2 – The increase in Stage 1 and Stage 2 ECL was driven by a number of factors. These included an ECL uplift for economic uncertainty, which affected all businesses, model refinements, asset migrations from Stage 3 impaired and portfolio growth.
- Provision coverage remained stable in the Stage 1 population and increased in Stage 2, with the uplift including the effect of methodology refinements. The Stage 3 provision coverage reduced slightly including the effect of debt sales and underlying business as usual movements.
- The impairment charge for the year was £398 million. This reflected the relatively stable external environment.
- The reduction in the Commercial Banking portfolio reflected the transfer of customers to RBSI and NWM as well as the continued exit from legacy assets.

Segmental loans and impairment metrics (audited)

The table below summarises gross loans and ECL provisions, by days past due, by segment and stage, within the scope of the ECL framework.

	Gross loans						ECL provisions (3)					
		Stage 2 (2)						Stage 2 (2)				
	Stage 1	<30 DPD	>30 DPD	Total	Stage 3	Total	Stage 1	<30 DPD	>30 DPD	Total	Stage 3	Total
31 December 2018 (1)	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m
UK PBB	146,764	14,163	791	14,954	2,220	163,938	131	434	54	488	796	1,415
Personal	*134,836*	*12,520*	*725*	*13,245*	*1,908*	*149,989*	*101*	*382*	*48*	*430*	*597*	*1,128*
Wholesale	*11,928*	*1,643*	*66*	*1,709*	*312*	*13,949*	*30*	*52*	*6*	*58*	*199*	*287*
Ulster Bank RoI	17,822	1,968	112	2,080	2,308	22,210	35	103	11	114	638	787
Personal (4)	*11,059*	*1,353*	*105*	*1,458*	*2,153*	*14,670*	*13*	*73*	*11*	*84*	*530*	*627*
Wholesale	*6,763*	*615*	*7*	*622*	*155*	*7,540*	*22*	*30*	—	*30*	*108*	*160*
Commercial Banking	79,106	7,445	364	7,809	2,136	89,051	94	134	2	136	743	973
Private Banking	13,750	380	151	531	225	14,506	13	5	5	10	20	43
Personal	*10,803*	*183*	*25*	*208*	*203*	*11,214*	*5*	*3*	—	*3*	*17*	*25*
Wholesale	*2,947*	*197*	*126*	*323*	*22*	*3,292*	*8*	*2*	*5*	*7*	*3*	*18*
RBS International	13,383	274	15	289	101	13,773	6	3	—	3	17	26
NatWest Markets	8,196	407	—	407	728	9,331	6	12	—	12	106	124
Central items & other	6,964	27	—	27	—	6,991	—	—	—	—	—	—
Total loans excluding balances at central banks	285,985	24,664	1,433	26,097	7,718	319,800	285	691	72	763	2,320	3,368
Personal	*159,553*	*14,106*	*865*	*14,971*	*4,351*	*178,875*	*122*	*458*	*59*	*517*	*1,158*	*1,797*
Wholesale	*126,432*	*10,558*	*568*	*11,126*	*3,367*	*140,925*	*163*	*233*	*13*	*246*	*1,162*	*1,571*
Balances at central banks	87,181	—	—	—	—	87,181	2	—	—	—	—	2
Total loans	373,166	24,664	1,433	26,097	7,718	406,981	287	691	72	763	2,320	3,370

	Financial assets				ECL provisions (3)			
	Stage 1	Stage 2	Stage 3	Total	Stage 1	Stage 2	Stage 3	Total
1 January 2018 (1)	£m	£m	£m	£m	£m	£m	£m	£m
UK PBB	145,650	14,490	3,202	163,342	144	352	1,110	1,606
Ulster Bank RoI	19,055	2,347	3,669	25,071	29	106	1,054	1,189
Commercial Banking	84,393	8,490	3,468	96,351	58	106	1,156	1,320
Private Banking	12,755	333	324	13,412	18	9	27	54
RBS International	7,791	307	119	8,217	5	5	28	38
NatWest Markets	11,762	995	501	13,258	2	42	190	234
Central items & other	52,523	10	—	52,533	5	1	—	6
Total financial assets excluding balances at central banks	333,929	26,972	11,283	372,184	261	621	3,565	4,447
Balances at central banks	96,566	5	—	96,571	1	—	—	1
Total financial assets	430,495	26,977	11,283	468,755	262	621	3,565	4,448

For the notes to this table refer to the following page.

Credit risk – Banking activities continued

Segmental loans and impairment metrics (audited)

The table below summarises gross loans and ECL provisions coverage, by days past due, by segment and stage, within the scope of the ECL framework.

	ECL provisions coverage						ECL		
		Stage 2 (2,3)					Total		Amounts
	Stage 1	<30 DPD	>30 DPD	Total	Stage 3	Total	charge	Loss rate	written-off
31 December 2018 (1)	%	%	%	%	%	%	£m	basis points	£m
UK PBB	0.09	3.06	6.83	3.26	35.86	0.86	342	20.9	557
Personal	*0.07*	*3.05*	*6.62*	*3.25*	*31.29*	*0.75*	*338*	*22.5*	*420*
Wholesale	*0.25*	*3.16*	*9.09*	*3.39*	*63.78*	*2.06*	*4*	*2.9*	*137*
Ulster Bank RoI	0.20	5.23	9.82	5.48	27.64	3.54	15	6.8	372
Personal (4)	*0.12*	*5.40*	*10.48*	*5.76*	*24.62*	*4.27*	*20*	*13.6*	*343*
Wholesale	*0.33*	*4.88*	—	*4.82*	*69.68*	*2.12*	*(5)*	*(6.6)*	*29*
Commercial Banking	0.12	1.80	0.55	1.74	34.78	1.09	144	16.2	460
Private Banking	0.09	1.32	3.31	1.88	8.89	0.30	(6)	(4.1)	7
Personal	*0.05*	*1.64*	—	*1.44*	*8.37*	*0.22*	*(6)*	*(5.4)*	*5*
Wholesale	*0.27*	*1.02*	*3.97*	*2.17*	*13.64*	*0.55*	—	—	*2*
RBS International	0.04	1.09	—	1.04	16.83	0.19	(2)	(1.5)	9
NatWest Markets	0.07	2.95	—	2.95	14.56	1.33	(92)	(98.6)	89
Central items and other	—	—	—	—	—	—	(3)	(4.3)	—
Total loans excluding balances at central banks	0.10	2.80	5.02	2.92	30.06	1.05	398	12.5	1,494
Personal	*0.08*	*3.25*	*6.82*	*3.45*	*26.61*	*1.00*	*354*	*19.8*	*776*
Wholesale	*0.13*	*2.21*	*2.29*	*2.21*	*34.51*	*1.11*	*44*	*3.1*	*718*
Total loans	0.08	2.80	5.02	2.92	30.06	0.83	398	9.8	1,494

	ECL provisions coverage					
		Stage 2 (2,3)				
	Stage 1	<30 DPD	>30 DPD	Total	Stage 3	Total
1 January 2018 (1)	%	%	%	%	%	%
Personal	0.09	2.54	4.80	2.63	28.46	1.31
- UK mortgages	*0.01*	*0.56*	*1.62*	*0.61*	*11.23*	*0.18*
- RoI mortgages	*0.07*	*4.44*	*7.09*	*4.67*	*26.02*	*6.18*
- Credit cards	*1.71*	*9.11*	*27.27*	*9.31*	*53.57*	*5.23*
- Other	*0.80*	*7.99*	*19.64*	*8.30*	*59.44*	*8.03*
Wholesale	0.07	1.88	2.07	1.88	35.51	1.09
- Property	*0.07*	*1.13*	*1.15*	*1.13*	*32.43*	*1.81*
- Corporate	*0.14*	*1.90*	*2.86*	*1.92*	*36.50*	*1.80*
- Financial institutions	*0.03*	*3.57*	—	*3.38*	*65.71*	*0.34*
- Other	*0.01*	*0.85*	—	*0.85*	—	*0.01*
Total financial assets	0.06	2.25	3.75	2.30	31.60	0.95

Notes:
(1) The segment analysis tables at 31 December 2018 include all loans – amortised cost within the scope of IFRS 9. The comparative tables at 1 January 2018 include all financial assets within the scope of IFRS 9, including debt securities of £50.4 billion, of which £42.7 billion related to debt securities classified as FVOCI. ECL on these debt securities at 1 January 2018 was £28 million, of which £4 million related to those classified as FVOCI.
(2) 30 DPD – 30 days past due, the mandatory 30 days past due backstop is prescribed by IFRS 9 for significant increase in credit risk.
(3) ECL provisions on contingent liabilities and commitments are included within the Financial assets section so as not to distort ECL coverage ratios.
(4) 31 December 2018, £3 million of the write offs related to business banking portfolio in Ulster Bank RoI.

Key points
- The UK PBB and Ulster Bank RoI franchises accounted for the vast majority of Personal provisions. In Ulster Bank RoI, Personal provisions were primarily driven by Stage 3 impairments on the legacy mortgage book.
- The Commercial Banking business accounted for the majority of Wholesale exposures. Wholesale provisions in UK PBB reflected exposures to business banking customers and also the commercial businesses in RBS England & Wales/NatWest Scotland.
- On performing exposures (Stage 1 and Stage 2), materially higher ECL provision was held in credit deteriorated Stage 2 exposures than in Stage 1, in line with expectations. This was also reflected in provision coverage levels.
- Also in line with expectations, the majority of Stage 2 exposures were less than 30 days past due, since PD deterioration is the primary driver of credit deterioration.
- The differing cover rates between the Personal and Wholesale portfolios – and across the business – largely reflected differences in asset mix, including security cover, and the differing impacts of external environment events.

Credit risk – Banking activities continued

Portfolio summary – sector analysis (audited)

The table below summarises financial assets and off-balance sheet exposures gross of ECL and related ECL provisions, impairment and past due by sector, asset quality and geographical region based on the country of operation of the customer.

	Personal				Wholesale					Total
31 December 2018	Mortgages (1) £m	Credit cards £m	Other personal £m	Total £m	Property £m	Corporate £m	FI £m	Sovereign £m	Total £m	£m
Loans by geography	165,081	4,216	9,578	178,875	36,707	72,240	25,011	6,967	140,925	319,800
- UK	*150,233*	*4,112*	*9,117*	*163,462*	*33,855*	*60,657*	*11,611*	*3,089*	*109,212*	*272,674*
- RoI	*14,350*	*104*	*233*	*14,687*	*1,114*	*3,733*	*392*	*2,497*	*7,736*	*22,423*
- Other Europe	*102*	*—*	*67*	*169*	*1,395*	*3,760*	*5,903*	*1,088*	*12,146*	*12,315*
- RoW	*396*	*—*	*161*	*557*	*343*	*4,090*	*7,105*	*293*	*11,831*	*12,388*
Loans by asset quality (2,3)	165,081	4,216	9,578	178,875	36,707	72,240	25,011	6,967	140,925	319,800
- AQ1-AQ4	*104,989*	*35*	*1,040*	*106,064*	*16,133*	*22,587*	*22,397*	*6,802*	*67,919*	*173,983*
- AQ5-AQ8	*55,139*	*3,990*	*7,736*	*66,865*	*18,815*	*47,651*	*2,574*	*161*	*69,201*	*136,066*
- AQ9	*1,287*	*69*	*239*	*1,595*	*74*	*359*	*5*	*—*	*438*	*2,033*
- AQ10	*3,666*	*122*	*563*	*4,351*	*1,685*	*1,643*	*35*	*4*	*3,367*	*7,718*
Loans by stage	165,081	4,216	9,578	178,875	36,707	72,240	25,011	6,967	140,925	319,800
- Stage 1	*149,760*	*2,851*	*6,942*	*159,553*	*33,145*	*61,844*	*24,502*	*6,941*	*126,432*	*285,985*
- Stage 2	*11,655*	*1,243*	*2,073*	*14,971*	*1,877*	*8,753*	*474*	*22*	*11,126*	*26,097*
- Stage 3	*3,666*	*122*	*563*	*4,351*	*1,685*	*1,643*	*35*	*4*	*3,367*	*7,718*
Loans - past due analysis (4,5)	165,081	4,216	9,578	178,875	36,707	72,240	25,011	6,967	140,925	319,800
- Not past due	*160,165*	*4,027*	*8,749*	*172,941*	*35,420*	*69,782*	*24,388*	*6,923*	*136,513*	*309,454*
- Past due 1-29 days	*1,714*	*69*	*180*	*1,963*	*270*	*1,397*	*604*	*42*	*2,313*	*4,276*
- Past due 30-89 days	*1,048*	*40*	*105*	*1,193*	*271*	*344*	*11*	*2*	*628*	*1,821*
- Past due 90-180 days	*632*	*29*	*69*	*730*	*56*	*83*	*1*	*—*	*140*	*870*
- Past due >180 days	*1,522*	*51*	*475*	*2,048*	*690*	*634*	*7*	*—*	*1,331*	*3,379*
Loans - Stage 2	11,655	1,243	2,073	14,971	1,877	8,753	474	22	11,126	26,097
- Not past due	*9,788*	*1,172*	*1,843*	*12,803*	*1,556*	*8,196*	*472*	*22*	*10,246*	*23,049*
- Past due 1-29 days	*1,126*	*43*	*133*	*1,302*	*68*	*244*	*1*	*—*	*313*	*1,615*
- Past due 30-89 days	*741*	*28*	*97*	*866*	*253*	*313*	*1*	*—*	*567*	*1,433*
Weighted average life *										
- ECL measurement (years)	8	2	3	5	3	3	4	3	3	4
Weighted average 12 months PDs *										
- IFRS 9 (%)	0.32	4.03	2.77	0.54	0.75	0.97	0.14	0.06	0.75	0.62
- Basel (%)	0.84	3.52	3.50	1.04	0.95	1.43	0.23	0.06	1.01	1.03
ECL provisions by geography	839	230	728	1,797	588	941	41	1	1,571	3,368
- UK	*237*	*227*	*707*	*1,171*	*518*	*615*	*27*	*1*	*1,161*	*2,332*
- RoI	*602*	*3*	*21*	*626*	*43*	*125*	*2*	*—*	*170*	*796*
- Other Europe	*—*	*—*	*—*	*—*	*22*	*53*	*10*	*—*	*85*	*85*
- RoW	*—*	*—*	*—*	*—*	*5*	*148*	*2*	*—*	*155*	*155*
ECL provisions by stage	839	230	728	1,797	588	941	41	1	1,571	3,368
- Stage 1	*23*	*38*	*61*	*122*	*43*	*107*	*12*	*1*	*163*	*285*
- Stage 2	*150*	*120*	*247*	*517*	*39*	*200*	*7*	*—*	*246*	*763*
- Stage 3	*666*	*72*	*420*	*1,158*	*506*	*634*	*22*	*—*	*1,162*	*2,320*
ECL provisions coverage (%)	0.51	5.46	7.60	1.00	1.60	1.30	0.16	0.01	1.11	1.05
- Stage 1 (%)	*0.02*	*1.33*	*0.88*	*0.08*	*0.13*	*0.17*	*0.05*	*0.01*	*0.13*	*0.10*
- Stage 2 (%)	*1.29*	*9.65*	*11.92*	*3.45*	*2.08*	*2.28*	*1.48*	*—*	*2.21*	*2.92*
- Stage 3 (%)	*18.17*	*59.02*	*74.60*	*26.61*	*30.03*	*38.59*	*62.86*	*—*	*34.51*	*30.06*
ECL charge	57	87	210	354	30	13	3	(2)	44	398
- UK	*38*	*88*	*207*	*333*	*31*	*9*	*6*	*(2)*	*44*	*377*
- RoI	*19*	*(1)*	*3*	*21*	*(1)*	*(3)*	*(1)*	*—*	*(5)*	*16*
- Other Europe	*—*	*—*	*—*	*—*	*—*	*8*	*(2)*	*—*	*6*	*6*
- RoW	*—*	*—*	*—*	*—*	*—*	*(1)*	*—*	*—*	*(1)*	*(1)*
ECL loss rate (%)	0.03	2.06	2.19	0.20	0.08	0.02	0.01	(0.03)	0.03	0.12
Amounts written-off	368	79	329	776	292	395	31	—	718	1,494

* Not within audit scope.

For the notes to this table refer to the following page.

Credit risk – Banking activities continued
Portfolio summary – sector analysis (audited)

31 December 2018	Personal: Mortgages £m	Personal: Credit cards £m	Personal: Other personal £m	Personal: Total £m	Wholesale: Property £m	Wholesale: Corporate £m	Wholesale: FI £m	Wholesale: Sovereign £m	Wholesale: Total £m	Total £m	Fixed £m	Variable £m
Loans by residual maturity	165,081	4,216	9,578	178,875	36,707	72,240	25,011	6,967	140,925	319,800	152,557	167,243
- <1yr	*11,244*	*919*	*4,960*	*17,123*	*9,533*	*29,788*	*17,602*	*6,362*	*63,285*	*80,408*	*20,534*	*59,874*
- 1-5yr	*35,184*	*3,297*	*3,816*	*42,297*	*18,797*	*30,772*	*6,167*	*245*	*55,981*	*98,278*	*34,250*	*64,028*
- 5yr	*118,653*	—	*802*	*119,455*	*8,377*	*11,680*	*1,242*	*360*	*21,659*	*141,114*	*97,773*	*43,341*
Other financial assets by asset quality (2)	—	—	—	—	105	652	8,838	134,546	144,141	144,141		
- AQ1-AQ4	—	—	—	—	*105*	*10*	*8,110*	*134,546*	*142,771*	*142,771*		
- AQ5-AQ8	—	—	—	—	—	*642*	*721*	—	*1,363*	*1,363*		
- AQ9	—	—	—	—	—	—	*4*	—	*4*	*4*		
- AQ10	—	—	—	—	—	—	*3*	—	*3*	*3*		
Off-balance sheet	13,228	16,613	12,229	42,070	16,044	52,730	28,761	29,277	126,812	168,882		
- Loan commitments	*13,228*	*16,613*	*12,229*	*42,070*	*15,335*	*48,569*	*26,684*	*29,276*	*119,864*	*161,934*		
- Financial guarantees	—	—	—	—	*709*	*4,161*	*2,077*	*1*	*6,948*	*6,948*		
Off-balance sheet by asset quality (2)	13,228	16,613	12,229	42,070	16,044	52,730	28,761	29,277	126,812	168,882		
- AQ1-AQ4	*12,116*	*422*	*9,103*	*21,641*	*11,945*	*36,134*	*27,364*	*29,262*	*104,705*	*126,346*		
- AQ5-AQ8	*1,101*	*15,900*	*3,116*	*20,117*	*3,928*	*16,390*	*1,397*	*15*	*21,730*	*41,847*		
- AQ9	*1*	*8*	*10*	*19*	*6*	*46*	—	—	*52*	*71*		
- AQ10	*10*	*283*	—	*293*	*165*	*160*	—	—	*325*	*618*		

		Total IFRS 9 credit risk exposure by stage					
			Stage 2 (2,3)				
1 January 2018	Total credit exposure £m	Stage 1 £m	<30 DPD £m	>30 DPD £m	Total £m	Stage 3 £m	ECL provisions £m
Personal	177,196	155,843	14,460	625	15,085	6,268	2,316
UK mortgages	*146,556*	*134,350*	*10,119*	*431*	*10,550*	*1,656*	*262*
RoI mortgages	*15,549*	*10,674*	*1,351*	*127*	*1,478*	*3,397*	*961*
Credit cards	*4,247*	*3,097*	*999*	*11*	*1,010*	*140*	*222*
Other personal (6)	*10,844*	*7,722*	*1,991*	*56*	*2,047*	*1,075*	*871*
Wholesale	194,988	178,086	11,500	387	11,887	5,015	2,131
Property	*37,877*	*33,884*	*1,942*	*87*	*2,029*	*1,964*	*685*
Corporate	*73,667*	*62,253*	*8,224*	*245*	*8,469*	*2,945*	*1,325*
Financial institutions	*34,064*	*32,923*	*981*	*55*	*1,036*	*105*	*115*
Sovereign	*49,380*	*49,026*	*353*	—	*353*	*1*	*6*
Total financial assets excluding balances at central banks	372,184	333,929	25,960	1,012	26,972	11,283	4,447
Balances at central banks	96,571	96,566	5	—	5	—	1
Total financial assets	468,755	430,495	25,965	1,012	26,977	11,283	4,448
Total contingent liabilities and commitments	146,800	139,550	6,388	113	6,501	749	
Total exposure	615,555	570,045	32,353	1,125	33,478	12,032	
Financial assets - asset quality (2)							
- AQ1-AQ4	230,773	223,789	6,883	101	6,984	—	
- AQ5-AQ8	128,814	109,962	17,449	660	18,109	743	
- AQ9	2,912	178	1,628	251	1,879	855	
- AQ10 (3)	9,685	—	—	—	—	9,685	

Notes:
(1) At 31 December 2018, Mortgages include £0.7 billion secured lending in Private Banking, in line with ECL calculation methodology.
(2) AQ bandings are based on Basel PDs.
(3) At 31 December 2018, AQ10 includes £0.6 billion (31 December 2017 – £0.7 billion) RoI mortgages which are not currently considered defaulted for capital calculation purposes for RoI but included in Stage 3.
(4) 30 DPD – 30 days past due, the mandatory 30 days past due backstop as prescribed by the IFRS 9 guidance for significant increase in credit risk.
(5) Days past due – Personal products: at a high level, for amortising products, the number of days past due is derived from the arrears amount outstanding and the monthly repayment instalment. For credit cards, it is based on payments missed, and for current accounts the number of continual days in excess of borrowing limit. Wholesale products: the number of days past due for all products is the number of continual days in excess of borrowing limit.
(6) At 1 January 2018, mortgages other than UK and RoI were reported within other personal but at 31 December 2018 they are reported separately.

Credit risk – Banking activities continued

Portfolio summary – sector analysis (audited)

Wholesale forbearance

The table below summarises Wholesale forbearance, Heightened Monitoring and Risk of Credit Loss by sector. Personal forbearance is disclosed on page 132.

2018	FI £m	Property £m	Sovereigns £m	Other corporate £m	Total £m
Forbearance (flow)	14	305	—	2,247	2,566
Forbearance (stock)	15	477	—	2,756	3,248
Heightened Monitoring and Risk of Credit Loss	100	503	16	4,145	4,764
2017					
Forbearance (flow)	11	417	—	1,473	1,901
Forbearance (stock)	14	764	—	3,067	3,845
Heightened Monitoring and Risk of Credit Loss	144	739	—	4,183	5,066

Risk elements in lending

The table below summarises risk elements in lending by segment on an IAS 39 basis.

	UK PBB £m	Ulster Bank RoI £m	Commercial Banking £m	Private Banking £m	RBS International £m	NatWest Markets £m	Central items & other £m	Total £m
At 1 January 2017	2,372	3,513	1,946	105	109	2,264	1	10,310
Inter segment transfers	—	—	1,384	—	—	(1,384)	—	—
Currency translation and other adjustments	—	123	—	—	5	(86)	1	43
Additions	1,227	550	1,590	28	62	98	14	3,569
Transfers between REIL and potential problem loans	(152)	—	10	(2)	7	8	—	(129)
Transfer to performing book	(294)	(336)	(283)	—	(33)	(12)	(1)	(959)
Repayments and disposals	(606)	(444)	(1,116)	(32)	(41)	(468)	(13)	(2,720)
Amounts written-off	(572)	(124)	(335)	(4)	(6)	(167)	(2)	(1,210)
At 31 December 2017	1,975	3,282	3,196	95	103	253	—	8,904

Provisions

The table below summarises provisions by segment on an IAS 39 basis.

	UK PBB £m	Ulster Bank RoI £m	Commercial Banking £m	Private Banking £m	RBS International £m	NatWest Markets £m	Central items & other £m	Total £m
At 1 January 2017	1,537	1,200	845	31	38	803	1	4,455
Inter segment transfers	—	—	293	—	—	(293)	—	—
Currency translation and other adjustments	—	8	(7)	—	—	(27)	—	(26)
Repayments and disposals	—	—	—	—	—	(5)	—	(5)
Amounts written-off	(572)	(124)	(335)	(4)	(6)	(167)	(2)	(1,210)
Recoveries of amounts previously written-off	117	12	16	—	1	10	—	156
Charges/(releases) to income statement	235	60	362	6	3	(137)	1	530
Unwind of discount	(37)	(25)	(12)	(1)	(1)	(10)	—	(86)
At 31 December 2017	1,280	1,131	1,162	32	35	174	—	3,814

Credit risk – Banking activities continued

Portfolio summary – sector analysis (audited)

Key points

- Geography – The majority of exposures in both the Personal and Wholesale portfolios were in the UK and the Republic of Ireland. Other exposures in Europe and the Rest of the World were mainly Wholesale. Mortgages, the vast majority of which are in the UK, accounted for more than half of the total exposure.
- Asset quality – Measured against RBS's asset quality scale, 54% of lending exposure was rated in the AQ1-AQ4 bands at 31 December 2018. This equated to an indicative investment rating of BBB- or above. Specifically 59% of Personal and 48% of Wholesale lending exposure were in the AQ1-AQ4 category respectively.
- Loans by stage – 90% of exposures were in Stage 1, with 8% in Stage 2 significantly credit deteriorated. Stage 3 assets, which align to AQ10, represented 2% of total exposures. In line with expectations, the Personal portfolio had a higher proportion of unsecured lending assets in Stage 2 than the mortgage portfolio. In the Wholesale portfolio, the proportion of assets in Stage 2 was slightly lower than in Personal overall.
- Loans – Past due analysis – Stage 2: the vast majority of assets overall were not past due, with the Stage 2 classification driven primarily by changes in lifetime PD. (For further detail, refer to the Significant increase in credit risk section). In mortgages, the majority of assets past due by more than 180 days were in Ulster Bank RoI reflecting the legacy mortgage portfolio and the residual effects from the financial crisis. In other personal, the relatively high rate of exposures past due by more than 90 days reflected the fact that impaired assets can be held on balance sheet with commensurate ECL provision for up to six years after default. Similarly in the Wholesale portfolio, impaired assets can be held on the balance sheet for a significant period of time while restructuring and recovery processes are concluded.
- Weighted average 12 months PDs – In Wholesale, Basel PDs, which are based on a through-the-cycle approach, tend to be higher than point-in-time best estimate IFRS 9 PDs, reflecting the current state in the economic cycle, and also an element of conservatism in the regulatory capital framework. In Personal, the Basel PDs, which are point-in-time estimates, tend to be higher also reflecting conservatism, higher in mortgages than other products, and an element of default rate under-prediction in the IFRS 9 PD models. This has been mitigated by ECL overlays of approximately £60 million at the year end, pending model calibrations being implemented. The IFRS 9 PD for credit cards was higher than the Basel equivalent and reflected the relative sensitivity of the IFRS 9 model to forward-looking economic drivers.
- ECL provision by geography – In line with exposures by geography, the weight of ECL related to exposures in the UK and the Republic of Ireland. The ECL in RoI was mainly Stage 3 provisions in the legacy Ulster Bank RoI mortgage portfolio.
- ECL provision by stage and coverage – The weight of ECL by value was in Stage 3 impaired, with similar seen in both Personal and Wholesale. Provision coverage was progressively higher by stage reflecting the lifetime nature of losses in both Stage 2 and Stage 3. In the Personal portfolio, provision coverage was materially lower in mortgages relative to credit cards and other personal reflecting the secured nature of the facilities. For Wholesale exposures, security and enterprise value mitigated against losses in Stage 3.
- The ECL charge for the year was £398 million. This reflected the relatively stable external environment.
- Other financial assets by asset quality – Consisting almost entirely of cash and balances at central banks and debt securities, these assets were mainly within the AQ1-AQ4 category.
- Off-balance sheet exposures by asset quality – For Personal exposures, undrawn exposures are reflective of available credit lines in credit cards and current accounts. Additionally, the mortgage portfolio had undrawn exposure, where a formal offer has been made to a customer but has not yet been drawn down. There is also a legacy portfolio of flexible mortgages where a customer has the right and ability to draw down further funds. The asset quality distribution in mortgages is heavily weighted to the highest quality bands AQ1-AQ4, with credit card concentrated in the risk bands AQ5-AQ8. In Wholesale, 83% of undrawn exposure, relating mainly to loan commitments, was in the AQ1-AQ4 category.
- Forbearance – Completed forbearance flow in 2018 for Wholesale was £2.6 billion compared to £1.9 billion in 2017. Forbearance granted in the transport sector increased to £493 million from £54 million, mainly driven by a customer which has been restructured and moved to Stage 2 from Stage 3 during the year. Forbearance across the diverse services sector increased from £347 million to £763 million. Of the forbearance that completed during the year, £1.1 billion related to payment concessions (2017 – £1.4 billion) and £1.4 billion related to non-payment concessions (2017 – £0.5 billion). Forbearance stock reduced by £0.6 billion, from £3.8 billion to £3.2 billion, driven by a decrease in forborne exposure in the energy and resources, property and retail and leisure sectors.
- Heightened Monitoring and Risk of Credit Loss – Exposure decreased from £5.1 billion at 31 December 2017, to £4.8 billion at 31 December 2018. There was also a decrease in the number of customers classified as Heightened Monitoring and Risk of Credit Loss during the year. Despite the current economic uncertainty in the UK, the portfolio has remained stable.

Credit risk – Banking activities continued

Portfolio summary – sector analysis (audited)

The table below summarises both current and potential exposure by geographical region on an IAS 39 basis.

2017	Personal £m	Wholesale (1) Banks and other FI's £m	Wholesale (1) Sovereigns (2) £m	Wholesale (1) Other £m	Current exposure £m	Personal %	Wholesale (1) Banks and other FI's %	Wholesale (1) Sovereigns (2) %	Wholesale (1) Other %	Total %	Total exposure £m
UK	158,965	17,992	91,161	94,896	363,014	33	4	19	20	76	413,378
RoI	15,319	751	2,416	4,612	23,098	3	—	1	1	5	24,502
Other Western Europe	514	7,504	43,414	8,559	59,991	—	2	9	2	13	86,866
US	377	6,987	8,430	2,580	18,374	—	1	2	1	4	31,497
RoW (3)	1,461	4,575	2,155	3,144	11,335	—	1	—	1	2	14,602
	176,636	37,809	147,576	113,791	475,812	36	8	31	25	100	570,845

Notes:
(1) Includes SME customers managed in UK PBB Business Banking who are assigned a sector under RBS's sector concentration framework.
(2) Includes exposures to central governments, central banks and sub-sovereigns such as local authorities.
(3) Rest of world (RoW) also includes supranationals such as the World Bank and exposure relating to ocean-going vessels which cannot be meaningfully assigned to specific countries from a country risk perspective.

Loan asset quality

The table below summarises asset quality and impairments by banks and customers on an IAS 39 basis.

2017	AQ1-AQ4 £bn	AQ5-AQ8 £bn	AQ9 £bn	AQ10 £bn	Past due £bn	Impaired £bn	Impairment provision £bn	Total £bn
Banks	27.7	2.6	—	—	—	—	—	30.3
Customers	226.8	109.6	2.8	0.7	6.4	7.4	(3.8)	349.9

Loan sector concentration

The table below summarises gross loans to banks and customers (excluding reverse repos) and related credit metrics by sector, on an IAS 39 basis.

2017	Gross loans £m	REIL £m	Provisions £m	Credit metrics: REIL as a % of gross loans %	Credit metrics: Provisions as a % of REIL %	Credit metrics: Provisions as a % of gross loans %	Impairment losses/ (releases) £m	Amounts written-off £m
Central and local government	4,684	—	—	—	—	—	—	—
Finance	30,832	54	44	0.2	81	0.1	3	7
Personal - mortgage (1)	163,010	3,876	994	2.4	26	0.6	50	87
- unsecured	14,587	937	763	6.4	81	5.2	235	424
Property	33,381	1,119	283	3.4	25	0.8	(82)	133
Construction	3,798	426	298	11.2	70	7.8	196	36
Of which: commercial real estate	*24,784*	*1,189*	*293*	*4.8*	*25*	*1.2*	*(76)*	*139*
Manufacturing	8,862	147	64	1.7	44	0.7	4	25
Finance leases and instalment credit	12,019	170	88	1.4	52	0.7	23	14
Retail, wholesale and repairs	12,300	446	193	3.6	43	1.6	93	81
Transport and storage	4,241	700	195	16.5	28	4.6	(32)	165
Health, education and leisure	11,337	330	145	2.9	44	1.3	65	48
Hotels and restaurants	6,049	193	80	3.2	41	1.3	17	46
Utilities	4,172	35	21	0.8	60	0.5	(18)	13
Other	17,726	471	256	2.7	54	1.4	(10)	131
Latent	—	—	390	—	—	—	(14)	—
Total customer	326,998	8,904	3,814	2.7	43	1.2	530	1,210
Total banks	16,264	—	—	—	—	—	—	—

Note:
(1) Mortgages are reported in sectors other than personal mortgages by certain businesses based on the nature of the relationship with the customer.

Past due analysis

The table below summarises loans – amortised cost to customers that were past due at the balance sheet date but were not considered impaired.

Number of days	2017 £m
Past due 1-29 days	3,535
Past due 30-59 days	902
Past due 60-89 days	456
Past due 90 days or more	1,481
	6,374

By sector	2017 £m
Personal	3,731
Property and construction	667
Financial institution	24
Other corporate	1,952
	6,374

Credit risk – Banking activities continued

Credit risk enhancement and mitigation (audited)

The table below summarises exposures of modelled portfolios within the scope of the ECL framework and related credit risk enhancement and mitigation (CREM). Excluded from this analysis are the non modelled portfolios, primarily Private Banking and RBSI mortgage portfolios, which are discussed in the Personal – portfolio section, including loan-to-value ratios. Refer to Policy elections and simplifications relating to IFRS 9 section for details on non-modelled portfolios.

2018	Gross exposure £bn	ECL £bn	Maximum credit risk Total £bn	Maximum credit risk Stage 3 £bn	CREM by type Financial (1) £bn	CREM by type Property £bn	CREM by type Other (2) £bn	CREM coverage Total £bn	CREM coverage Stage 3 £bn	Exposure post CREM Total £bn	Exposure post CREM Stage 3 £bn
Financial assets											
Cash and balances at central banks	87.2	—	87.2	—	—	—	—	—	—	87.2	—
Loans - amortised cost (3)	302.6	3.2	299.4	5.0	4.1	188.1	19.7	211.9	4.5	87.5	0.5
Personal (4)	164.6	1.7	162.9	2.9	—	151.7	—	151.7	2.7	11.2	0.2
Wholesale (5)	138.0	1.5	136.5	2.1	4.1	36.4	19.7	60.2	1.8	76.3	0.3
Debt securities	57.0	—	57.0	—	—	—	—	—	—	57.0	—
Total financial assets	446.8	3.2	443.6	5.0	4.1	188.1	19.7	211.9	4.5	231.7	0.5
Contingent liabilities and commitments											
Personal (6)	31.0	—	31.0	0.3	—	4.9	—	4.9	—	26.1	0.3
Wholesale	126.2	—	126.2	0.3	0.6	5.9	6.1	12.6	—	113.6	0.3
Total off balance sheet	157.2	—	157.2	0.6	0.6	10.8	6.1	17.5	—	139.7	0.6
Total exposure	604.0	3.2	600.8	5.6	4.7	198.9	25.8	229.4	4.5	371.4	1.1

Notes:
(1) Financial collateral includes cash and securities collateral.
(2) Other collateral includes guarantees, charges over trade debtors as well as the amount by which credit risk exposure is reduced through netting arrangements, mainly cash management pooling, which give RBS a legal right to set off the financial asset against a financial liability due to the same counterparty.
(3) RBS holds collateral in respect of individual loans – amortised cost to banks and customers. This collateral includes mortgages over property (both personal and commercial); charges over business assets such as plant and equipment, inventories and trade debtors; and guarantees of lending from parties other than the borrower. RBS obtains collateral in the form of securities in reverse repurchase agreements. Collateral values are capped at the value of the loan.
(4) On personal, Stage 3 mortgage exposures have relatively limited uncovered exposure reflecting the security held. On unsecured credit cards and other personal borrowing, the residual uncovered amount reflects historical experience of continued cash recovery post default through on-going engagement with customers.
(5) Stage 3 exposures post credit risk enhancement and mitigation in wholesale mainly represent enterprise value and the impact of written down collateral values; an individual assessment to determine ECL will consider multiple scenarios and in some instances allocate a probability weighting to a collateral value in excess of the written down value.
(6) At 31 December 2018, £0.3 billion personal Stage 3 balances primarily relate to loan commitments, the draw down of which is effectively prohibited.

The table below summarises financial asset exposures, both gross and net of offset arrangements, as well as credit mitigation and enhancement.

2017	Gross exposure £bn	IFRS offset (5) £bn	Carrying value (6) £bn	Balance sheet offset (7) £bn	Collateral (1) Cash (2) £bn	Collateral (1) Securities (3) £bn	Collateral (1) Real estate and other Residential (4) £bn	Collateral (1) Real estate and other Commercial (4) £bn	Credit enhancement (8) £bn	Exposure post credit mitigation and enhancement £bn
Cash and balances at central banks	98.4	—	98.4	—	—	—	—	—	—	98.4
Trading assets	118.6	(32.6)	86.0	(0.3)	—	(32.5)	—	—	—	53.2
Derivatives	177.9	(17.1)	160.8	(128.3)	(20.3)	(5.9)	—	—	(6.3)	—
Settlement balances	3.2	(0.7)	2.5	—	—	—	—	—	—	2.5
Loans - amortised cost	334.1	(12.5)	321.6	(27.9)	(0.9)	(11.2)	(174.2)	(45.0)	(2.1)	60.3
Other financial assets	52.0	—	52.0	—	—	—	—	(0.1)	—	51.9
Total third party gross of short positions	784.2	(62.9)	721.3	(156.5)	(21.2)	(49.6)	(174.2)	(45.1)	(8.4)	266.3
Short positions	(28.5)	—	(28.5)	—	—	—	—	—	—	(28.5)
Net of short positions	755.7	(62.9)	692.8	(156.5)	(21.2)	(49.6)	(174.2)	(45.1)	(8.4)	237.8

Notes:
(1) RBS holds collateral in respect of individual loans. This collateral includes mortgages over property (both personal and commercial); charges over business assets such as plant, inventories and trade debtors; and guarantees of lending from parties other than the borrower. RBS obtains collateral in the form of securities in reverse repurchase agreements. Cash and securities are received as collateral in respect of derivative transactions.
(2) Includes cash collateral pledged by counterparties based on daily mark-to-market movements of net derivative positions with the counterparty.
(3) Represent the fair value of securities received from counterparties, mainly relating to reverse repo transactions as part of netting arrangements.
(4) Property valuations are capped at the loan value and reflect the application of haircuts in line with regulatory rules to indexed valuations. Commercial collateral includes ships and plan and equipment collateral.
(5) Relates to offset arrangements that comply with IFRS criteria and transactions cleared through and novated to central clearing houses, primarily London Clearing House (LCH) and US Government Securities Clearing Corporation. During 2017 changes in the legal contracts with LCH and CME led to many derivatives cleared through that counterparty being settled to market each day rather than being collateralised as previously. This led to the derecognition of the associated assets and liabilities.
(6) The carrying value on the balance sheet represents the maximum exposure to credit risk by class of financial instrument.
(7) The amount by which credit risk exposure is reduced through arrangements, such as master netting agreements and cash management pooling, which give RBS a legal right to set off the financial asset against a financial liability due to the same counterparty.
(8) Comprises credit derivatives (bought protection) and guarantees against exposures.

Credit risk – Banking activities continued

Personal portfolio (audited)

Disclosures in the Personal portfolio section include drawn exposure (gross of provisions). Loan-to-value (LTV) ratios are split by stage under IFRS 9 at 31 December 2018 and by performing and non-performing status under IAS 39 at 31 December 2017.

	2018					2017				
	UK PBB	Ulster Bank RoI	Private Banking	RBSI	Total	UK PBB	Ulster Bank RoI	Private Banking	RBSI	Total
Personal lending	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m
Mortgages	138,250	14,361	9,082	2,684	164,377	136,625	15,352	8,421	2,745	163,143
Of which:										
Owner occupied	122,642	13,105	7,953	1,781	145,481	118,764	13,455	7,275	1,821	141,315
Buy-to-let	15,608	1,256	1,129	903	18,896	17,861	1,897	1,146	924	21,828
Interest only - variable	8,358	188	3,871	489	12,906	11,245	260	4,076	636	16,217
Interest only - fixed	12,229	12	3,636	187	16,064	12,584	8	2,866	96	15,554
Mixed (1)	6,036	68	2	18	6,124	6,039	79	2	20	6,140
Impairment provisions (2)	212	602	5	16	835	153	909	7	27	1,096
Other personal lending (3)	11,633	330	1,676	55	13,694	11,080	348	1,701	65	13,194
Impairment provisions (2)	909	25	19	1	954	833	44	19	2	898
Total personal lending	149,883	14,691	10,758	2,739	178,071	147,705	15,700	10,122	2,810	176,337
Mortgage LTV ratios										
- Total portfolio	56%	62%	56%	58%	57%	56%	69%	55%	58%	57%
- Stage 1	56%	58%	56%	57%	56%	56%	65%	55%	56%	57%
- Stage 2	58%	67%	58%	55%	59%					
- Stage 3	55%	77%	58%	99%	69%	57%	88%	59%	122%	78%
- Buy-to-let	53%	64%	53%	53%	54%	54%	75%	54%	50%	56%
- Stage 1	53%	58%	53%	52%	53%					
- Stage 2	57%	72%	53%	57%	60%					
- Stage 3	58%	78%	68%	75%	71%					
Gross new mortgage lending	29,555	1,015	1,846	353	32,769	30,314	890	2,243	481	33,928
of which:										
Owner occupied	28,608	1,004	1,689	241	31,542	28,504	875	1,904	319	31,602
Weighted average LTV	69%	73%	62%	68%	69%	70%	75%	63%	70%	70%
Buy-to-let	947	11	157	112	1,227	1,810	15	339	162	2,326
Weighted average LTV	61%	57%	55%	61%	60%	62%	57%	56%	62%	61%
Interest only - variable rate	43	—	697	13	753	335	6	902	39	1,282
Interest only - fixed rate	1,189	—	764	43	1,996	1,835	1	874	48	2,758
Mixed (1)	912	1	—	—	913	893	—	—	—	893
Mortgage forbearance (4)										
Forbearance flow	446	210	11		667	440	201	31	5	677
Forbearance stock	1,338	2,645	8		3,991	1,384	3,893	7	25	5,309
Current	*724*	*1,291*	*6*		*2,021*	*834*	*1,779*	*6*	*12*	*2,631*
1-3 months in arrears	*350*	*261*	—		*611*	*304*	*466*	—	*2*	*772*
> 3 months in arrears	*264*	*1,093*	*2*		*1,359*	*246*	*1,648*	*1*	*11*	*1,906*

Notes:
(1) Includes accounts which have an interest only sub-account and a capital and interest sub-account to provide a more comprehensive view of interest only exposures.
(2) 31 December 2018 data was prepared under IFRS 9. 31 December 2017 data was prepared under IAS 39. For UK PBB this excludes a non-material amount of provisions held on relatively small legacy portfolios.
(3) Excludes loans that are commercial in nature, for example loans guaranteed by a company and commercial real estate lending to Personal customers.
(4) The reduction in RBSI forbearance is due to reclassification.

Credit risk – Banking activities continued

Key points

- Overall – The overall credit risk profile of the Personal portfolio, and its performance against credit risk appetite, remained stable during 2018.
- Total lending – Total mortgage lending grew by £1.2 billion with new lending partly offset by redemptions and repayments.
- New mortgage lending was lower than 2017. Existing mortgage stock and new business were closely monitored against agreed risk appetite parameters. These included loan-to-value ratios, buy-to-let concentrations, new-build concentrations and credit quality. Underwriting standards were maintained during the period.
- Owner occupied and buy-to-let – Most of the mortgage growth was in the owner-occupied portfolio. New mortgages in the buy-to-let portfolio remained subdued.
- LTVs – The mortgage portfolio loan-to-value ratio remained stable. The improvement in Ulster Bank RoI reflected house price recovery and the disposal of a portfolio of mortgages during the year, which also contributed to the reduction in the level of exposures in Stage 3.
- Interest only – By value, the proportion of mortgages on interest only and mixed terms (capital and interest only) reduced, driven by fewer buy-to-let mortgages.
- Regional mortgage analysis – For UK PBB, 42% of mortgage lending was in Greater London and the South East (31 December 2017 – 43%). The level of exposure in this region remained broadly unchanged, reflecting lower demand for buy-to-let properties as well as mortgage redemptions. The weighted average loan-to-value for these regions was 52% (31 December 2017 – 51%) compared to an average of 56%.
- Interest rate profile – As at 31 December 2018, 81% of customers in the UK PBB mortgage portfolio were on fixed rates (42% on five-year deals). In addition, 97% of all new mortgage completions in 2018 were fixed rate mortgages (62% of which were five-year mortgages), as customers sought to minimise the impact of potential rate rises.
- Provisions – As expected, total ECL – including ECL for unsecured lending – generally increased under the IFRS 9 methodology compared to provisions calculated under IAS 39. The reduction in Ulster Bank RoI mortgage provisions was driven by a sale of legacy impaired debt.
- Other lending – Total unsecured lending grew modestly in 2018, driven by growth in the PBB personal loan portfolio. Overdraft balances have shown a modest decline year-on-year.
- Other lending asset quality – Unsecured credit quality remained stable, reflecting active portfolio management. Credit standards and controls were tightened across all three unsecured products to ensure that higher risk customer performance remained within risk appetite.

Personal portfolio (audited)

Mortgage LTV distribution by stage

The table below summarises gross mortgage lending and related ECL by LTV band. Mortgage lending not within the scope of IFRS 9 ECL reflected portfolios carried at fair value.

	Mortgages						ECL				ECL provisions coverage (2)			
UK PBB				Not within IFRS 9 ECL		Of which: gross new								
	Stage 1	Stage 2	Stage 3	scope	Total	lending	Stage 1	Stage 2	Stage 3	Total (1)	Stage 1	Stage 2	Stage 3	Total
2018	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	%	%	%	%
≤50%	47,111	3,423	516	153	51,203	4,779	2	16	64	82	—	0.5	12.4	0.2
>50% and ≤70%	44,037	3,632	459	49	48,177	8,535	2	23	39	64	—	0.6	8.5	0.1
>70% and ≤80%	20,345	1,490	135	15	21,985	7,434	1	11	11	23	—	0.7	8.1	0.1
>80% and ≤90%	12,733	1,118	81	12	13,944	7,524	2	12	8	22	—	1.1	10.0	0.2
>90% and ≤100%	2,343	178	24	7	2,552	1,104	1	4	3	8	—	2.4	12.1	0.3
>100% and ≤110%	57	35	8	1	101	—	—	2	1	3	0.1	4.6	14.1	2.8
>110% and ≤130%	53	41	9	2	105	—	—	2	1	3	0.1	5.4	14.6	3.4
>130% and ≤150%	23	23	6	—	52	—	—	1	1	2	0.1	6.2	13.4	4.3
>150%	3	9	3	—	15	—	—	1	1	2	0.1	6.2	17.3	7.2
Total with LTVs	126,705	9,949	1,241	239	138,134	29,376	8	72	129	209	—	0.7	10.4	0.2
Other	96	13	4	3	116	179	—	1	2	3	—	4.7	53.5	2.6
Total	126,801	9,962	1,245	242	138,250	29,555	8	73	131	212	—	0.7	10.5	0.2

		Non-		Of which: gross new
	Performing	performing	Total	lending
2017	£m	£m	£m	£m
≤50%	50,583	527	51,110	4,593
>50% and ≤70%	47,361	505	47,866	8,310
>70% and ≤80%	20,514	150	20,664	7,709
>80% and ≤90%	13,409	87	13,496	8,239
>90% and ≤100%	2,559	36	2,595	1,285
>100% and ≤110%	130	14	144	1
>110% and ≤130%	114	10	124	1
>130% and ≤150%	58	5	63	—
>150%	25	8	33	1
Total with LTVs	134,753	1,342	136,095	30,139
Other	512	18	530	175
Total	135,265	1,360	136,625	30,314

For the notes to this table refer to the following page.

Credit risk – Banking activities continued

Personal portfolio (audited)

Mortgage LTV distribution by stage

Ulster Bank RoI	Mortgages					ECL provisions				ECL provisions coverage (2)			
2018	Stage 1 £m	Stage 2 £m	Stage 3 £m	Not within IFRS 9 ECL £m	Total £m	Stage 1 £m	Stage 2 £m	Stage 3 £m	Total £m	Stage 1 %	Stage 2 %	Stage 3 %	Total %
≤50%	3,818	374	463	—	4,655	1	5	40	46	—	1.4	8.6	1.0
>50% and ≤70%	3,567	365	459	—	4,391	2	10	47	59	—	2.7	10.3	1.3
>70% and ≤80%	1,564	190	241	—	1,995	1	11	52	64	0.1	5.5	21.5	3.2
>80% and ≤90%	1,059	184	272	—	1,515	2	15	82	99	0.2	8.3	30.2	6.5
>90% and ≤100%	570	154	261	—	985	2	17	99	118	0.4	11.1	37.7	11.9
>100% and ≤110%	197	80	207	—	484	2	10	85	97	0.9	12.8	41.1	20.1
>110% and ≤130%	51	35	179	—	265	—	6	84	90	0.8	16.6	47.0	34.0
>130% and ≤150%	5	5	37	—	47	—	1	20	21	0.3	19.1	54.7	45.2
>150%	10	1	13	—	24	—	1	7	8	2.1	27.2	58.9	33.5
Total with LTVs	10,841	1,388	2,132	—	14,361	10	76	516	602	0.1	5.4	24.2	4.2

2017	Performing £m	Non-performing £m	Total £m
≤50%	3,743	333	4,076
>50% and ≤70%	3,600	382	3,982
>70% and ≤80%	1,858	233	2,091
>80% and ≤90%	1,420	273	1,693
>90% and ≤100%	1,070	309	1,379
>100% and ≤110%	814	317	1,131
>110% and ≤130%	378	414	792
>130% and ≤150%	20	126	146
>150%	23	39	62
Total with LTVs	12,926	2,426	15,352

Notes:
(1) Excludes a non-material amount of provisions held on relatively small legacy portfolios.
(2) ECL provisions coverage is ECL provisions divided by drawn exposure.

Key point

- ECL coverage rates increase through the LTV bands with both UK PBB and Ulster Bank RoI having only limited exposures in the highest LTV bands. The relatively high coverage level in the lowest LTV band for UK PBB included the effect of time-discounting on expected recoveries. Additionally, this also reflected the modelling approach that recognised an element of expected loss on mortgages that are not subject to formal repossession activity.

Credit risk – Banking activities continued

Personal portfolio (audited)

UK PBB Mortgage LTV distribution by region

2018	≤50% £m	50% ≤80% £m	80% ≤100% £m	100% ≤150% £m	>150% £m	Total £m	Weighted average LTV %	Other £m	Total £m	Total %
South East	14,699	17,147	2,843	8	—	34,697	53	27	34,724	25
Greater London	12,928	9,614	1,298	3	—	23,843	48	19	23,862	17
Scotland	3,205	5,612	1,844	11	—	10,672	60	8	10,680	8
North West	4,163	7,756	1,970	6	—	13,895	59	12	13,907	10
South West	4,231	6,843	1,292	8	—	12,374	57	9	12,383	9
West Midlands	3,036	5,642	1,192	4	—	9,874	58	7	9,881	7
Rest of the UK	8,942	17,548	6,056	217	16	32,779	62	34	32,813	24
Total	51,204	70,162	16,495	257	16	138,134	56	116	138,250	100
2017										
South East	14,606	16,908	2,729	10	—	34,253	53	96	34,349	25
Greater London	13,592	9,900	1,322	3	—	24,817	48	112	24,929	18
Scotland	2,850	5,341	2,423	45	—	10,659	63	34	10,693	8
North West	4,125	7,510	2,131	11	—	13,777	59	63	13,840	10
South West	4,181	6,572	1,055	9	—	11,817	56	40	11,857	9
West Midlands	2,578	5,264	1,503	6	—	9,351	61	42	9,393	7
Rest of the UK	9,175	17,037	4,929	247	33	31,421	60	143	31,564	23
Total	51,107	68,532	16,092	331	33	136,095	56	530	136,625	100

Commercial real estate (CRE)

The CRE portfolio comprises exposures to entities involved in the development of, or investment in, commercial and residential properties (including house builders but excluding housing associations, construction and building materials). The sector is reviewed regularly at senior executive committees. Reviews include portfolio credit quality, capital consumption and control frameworks. All disclosures in the CRE section are based on current exposure (gross of provisions and risk transfer). Current exposure is defined as: loans; the amount drawn under a credit facility plus accrued interest; contingent obligations; the issued amount of the guarantee or letter of credit; derivatives - the mark to market value, netted where netting agreements exist and net of legally enforceable collateral.

	2018				2017			
By geography and sub sector (1)	UK £m	RoI £m	Other £m	Total £m	UK £m	RoI £m	Other £m	Total £m
Investment								
Residential (2)	4,426	363	54	4,843	4,319	227	39	4,585
Office (3)	2,889	164	651	3,704	3,055	235	600	3,890
Retail (4)	5,168	40	92	5,300	5,401	42	132	5,575
Industrial (5)	2,270	51	176	2,497	2,438	36	14	2,488
Mixed/other (6)	3,221	180	123	3,524	4,609	203	228	5,040
	17,974	798	1,096	19,868	19,822	743	1,013	21,578
Development								
Residential (2)	2,715	122	124	2,961	3,107	145	154	3,406
Office (3)	192	—	—	192	169	—	—	169
Retail (4)	94	7	1	102	187	5	2	194
Industrial (5)	119	2	12	133	49	—	—	49
Mixed/other (6)	32	2	—	34	59	3	—	62
	3,152	133	137	3,422	3,571	153	156	3,880
Total	21,126	931	1,233	23,290	23,393	896	1,169	25,458

Notes:
(1) Geographical splits are based on country of collateral risk.
(2) Residential properties including houses, flats and student accommodation.
(3) Office properties including offices in central business districts, regional headquarters and business parks.
(4) Retail properties including high street retail, shopping centres, restaurants, bars and gyms.
(5) Industrial properties including distribution centres, manufacturing and warehouses.
(6) Mixed usage or other properties that do not fall within the other categories above. Mixed generally relates to a mixture of retail/office with residential.

Capital and risk management

Credit risk – Banking activities continued

Commercial real estate (CRE)

CRE LTV distribution by stage (audited)

The table below summarises CRE current exposure and related ECL by LTV band.

	2018													2017		
	Current exposure (gross of provisions) (1,2)					ECL provisions				ECL provisions coverage (4)						
	Stage 1 £m	Stage 2 £m	Stage 3 £m	Not within IFRS 9 scope (3) £m	Total £m	Stage 1 £m	Stage 2 £m	Stage 3 £m	Total £m	Stage 1 %	Stage 2 %	Stage 3 %	Total %	Performing £m	Non-performing £m	Total £m
≤50%	8,229	245	52	795	9,321	7	4	14	25	0.1	1.7	26.4	0.3	9,622	66	9,688
>50% and ≤70%	4,769	297	78	703	5,847	6	6	14	26	0.1	2.0	17.8	0.5	6,621	119	6,740
>70% and ≤80%	394	43	33	6	476	1	1	8	10	0.3	2.6	23.4	2.1	405	52	457
>80% and ≤90%	55	11	24	2	92	—	—	5	5	0.3	3.4	20.9	6.1	158	42	200
>90% and ≤100%	31	7	20	1	59	—	—	7	7	0.6	5.1	34.9	12.9	89	31	120
>100% and ≤110%	53	4	15	—	72	—	—	5	5	0.3	4.2	34.6	7.6	34	21	55
>110% and ≤130%	22	3	111	4	140	—	—	22	22	0.4	5.4	19.4	16.0	60	421	481
>130% and ≤150%	6	10	10	—	26	—	1	4	5	0.9	6.3	40.6	18.1	44	29	73
>150%	30	6	42	—	78	—	1	29	30	0.5	9.8	69.6	38.1	149	72	221
Total with LTVs	13,589	626	385	1,511	16,111	14	13	108	135	0.1	2.1	27.9	0.9	17,182	853	18,035
Total portfolio average LTV%	45	56	114	48	47	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	48	119	51
Other (5)	2,655	133	784	185	3,757	4	5	50	59	0.2	4.0	6.3	1.7	3,112	431	3,543
Development (6)	2,865	205	178	174	3,422	11	3	80	94	0.4	1.6	44.8	2.9	3,634	246	3,880
Total	19,109	964	1,347	1,870	23,290	29	21	238	288	0.2	2.3	17.6	1.3	23,928	1,530	25,458

Notes:
(1) CRE current exposure comprises gross lending, interest rate hedging derivatives and other assets carried at fair value that are managed as part of the overall CRE portfolio.
(2) The exposure in Stage 3 mainly related to legacy assets.
(3) Includes exposures relating to non-modelled portfolios and other exposures carried at fair value, including derivatives.
(4) ECL provisions coverage is ECL provisions divided by current exposure.
(5) Relates mainly to business banking, rate risk management products and unsecured corporate lending. The low Stage 3 ECL provisions coverage was driven by a single large exposure, which has been written down to the expected recoverable amount.
(6) Relates to the development of commercial and residential properties. LTV is not a meaningful measure for this type of lending activity.

Key points (audited)

- Overall – The majority of the CRE portfolio was managed in the UK within Commercial Banking, Private Banking and UK PBB. The remainder was managed in Ulster Bank RoI and NatWest Markets. Business appetite and strategy remain aligned across the segments.
- 2018 trends – Growth in the commercial property market slowed during 2018.
- Performance varied widely by sub-sector with strong growth from industrials contrasting with material decline in parts of the retail sector.
- Credit quality – The CRE retail portfolio had a low default rate, with a limited number of new defaults. The sub-sector was monitored on a regular basis and credit quality was in line with the wider CRE portfolio.
- Economics – Fundamentals such as rental incomes, property values and investor/occupier demand for other commercial sub-sectors appeared more robust, however, all are exposed to some degree to the risk of a disorderly exit from the EU. Conditions for the mainstream residential sector remained resilient, supported by mortgage availability and high levels of employment. However, the higher value end of the market was characterised by low transaction volumes.
- Risk appetite – Lending criteria for commercial real estate were at conservative levels, contributing to materially reduced leverage for new origination in London offices and parts of the retail sector.

Credit risk – Banking activities continued

Flow statements (audited)

The ECL flow statements analyse the key elements that drive the movement of ECL and related income statement over the reporting period. The key themes are:

- The flow statements capture the changes in ECL as well as the changes in related financial assets used in determining ECL. Exposures in this section may therefore differ from those reported in other tables in the credit risk section, principally in relation to exposures in Stage 1 and Stage 2. These differences do not have a material ECL impact.
- Financial assets presented in the flow statements include treasury liquidity portfolios, comprising balances at central banks and debt securities, as well as loans. Both modelled and non-modelled portfolios are included.
- Inter-Group transfers were a feature of the ECL flows during 2018 as a result of ring-fencing related changes. These transfers had no impact at a RBS Group-wide level.
- Stage transfers (for example, exposures moving from Stage 1 to Stage 2) – these transfers are a key feature of the ECL movements, with the net re-measurement cost of transitioning to a worse stage being a primary driver of income statement charges for the period (likewise there is an ECL benefit for accounts improving stage).
- Changes in risk parameters – captures the reassessment of the ECL within a given stage, including any ECL overlays and residual income statement gains or losses at the point of write-off or accounting write-down.
- Other (P&L only items) – includes any subsequent changes in the value of written-down assets (for example, fortuitous recoveries) along with other direct write-off items such as direct recovery costs. Note: other (P&L only items) only affects the income statement and does not impact the balance sheet ECL movements.
- Amounts written-off – represent the gross asset written-down against accounts with ECL, including the net asset write-down for debt sale activity.
- There were small amounts of ECL flows from Stage 3 to Stage 1 during the year. This does not however indicate that accounts can return from Stage 3 to Stage 1 directly. On a similar basis, flows from Stage 1 to Stage 3 were observed, however this also included legitimate transfers due to unexpected default events. The small number of write-offs in Stage 1 and 2 reflect the effect of portfolio debt sales and also staging at the start of the analysis period.
- The impact of model changes during 2018 were not material at a RBS Group-wide level or on the portfolios disclosed below.

	Stage 1		Stage 2		Stage 3		Total	
	Financial assets	ECL	Financial assets	ECL	Financial assets	ECL	Financial assets	ECL
Group total	£m	£m	£m	£m	£m	£m	£m	£m
At 1 January 2018	419,038	262	29,637	621	10,595	3,565	459,270	4,448
Currency translation and other adjustments	1,820	(6)	88	17	50	(11)	1,958	—
Transfers from Stage 1 to Stage 2	(18,416)	(52)	18,416	52	—	—	—	—
Transfers from Stage 2 to Stage 1	13,723	228	(13,723)	(228)	—	—	—	—
Transfers to Stage 3	(1,205)	(3)	(1,837)	(108)	3,042	111	—	—
Transfers from Stage 3	1,272	16	1,523	163	(2,795)	(179)	—	—
Net re-measurement of ECL on stage transfer		(207)		247		447		487
Changes in risk parameters (model inputs)		34		74		36		144
Other changes in net exposure	6,312	29	(6,716)	(32)	(1,633)	(85)	(2,037)	(88)
Other (P&L only items - primarily fortuitous recoveries)		1		3		(149)		(145)
Income statement (releases)/charges		(143)		292		249		398
Amounts written-off	(3)	(3)	(28)	(28)	(1,463)	(1,463)	(1,494)	(1,494)
Other movements		(1)		(6)		(94)		(101)
At 31 December 2018	422,541	297	27,360	772	7,796	2,327	457,697	3,396
Net carrying amount	422,244		26,588		5,469		454,301	

The following flow statements provide insight into the material portfolios underpinning the Group flow statements.

Personal

The following flow statements are at a portfolio level.

UK PBB - mortgages	Stage 1 Financial assets	Stage 1 ECL	Stage 2 Financial assets	Stage 2 ECL	Stage 3 Financial assets	Stage 3 ECL	Total Financial assets	Total ECL
At 1 January 2018	124,180	11	10,621	64	1,353	157	136,154	232
Transfers from Stage 1 to Stage 2	(4,928)	(1)	4,928	1	—	—	—	—
Transfers from Stage 2 to Stage 1	4,245	15	(4,245)	(15)	—	—	—	—
Transfers to Stage 3	(61)	—	(327)	(5)	388	5	—	—
Transfers from Stage 3	7	—	235	23	(242)	(23)	—	—
Net re-measurement of ECL on stage transfer		(15)		11		17		13
Changes in risk parameters (model inputs)		—		4		51		55
Other changes in net exposure	4,228	—	(970)	(6)	(257)	(14)	3,001	(20)
Other (P&L only items)		1		—		(6)		(5)
Income statement (releases)/charges		(14)		9		48		43
Amounts written-off	—	—	(1)	(1)	(26)	(26)	(27)	(27)
Other movements		—		(2)		(35)		(37)
At 31 December 2018	127,671	10	10,241	74	1,216	132	139,128	216
Net carrying amount	127,661		10,167		1,084		138,912	

Key points

- Overall ECL reduction was primarily driven by business-as-usual write-offs in Stage 3.
- Stage 1 ECL levels remained steady despite portfolio growth during 2018 as a result of modest PD reduction, with Stage 2 ECL showing an increase as a result of some additional forward-looking provisions being taken during the year.
- Transfers from Stage 3 back to the performing book were higher than those in Personal unsecured lending, due to the higher cure activity typically seen in mortgages.
- The increase in Stage 3 ECL changes in risk parameters reflected the monthly assessment of the loss requirement, capturing underlying changes in risk and forward-looking assessments.
- Write-off of any residual shortfall following the sale of a repossessed property typically occurs within five years, although this period can be longer, reflecting the ongoing support for customers who engage constructively with RBS.

Capital and risk management

Credit risk – Banking activities continued

Flow statements (audited)

UK PBB - credit cards	Stage 1 Financial assets £m	Stage 1 ECL £m	Stage 2 Financial assets £m	Stage 2 ECL £m	Stage 3 Financial assets £m	Stage 3 ECL £m	Total Financial assets £m	Total ECL £m
At 1 January 2018	2,841	52	997	94	105	75	3,943	221
Transfers from Stage 1 to Stage 2	(739)	(15)	739	15	—	—	—	—
Transfers from Stage 2 to Stage 1	763	50	(763)	(50)	—	—	—	—
Transfers to Stage 3	(42)	(1)	(88)	(20)	130	21	—	—
Transfers from Stage 3	1	1	2	1	(3)	(2)	—	—
Net re-measurement of ECL on stage transfer		(38)		66		68		96
Changes in risk parameters (model inputs)		(15)		—		(4)		(19)
Other changes in net exposure	(192)	2	343	17	(45)	—	106	19
Other (P&L only items)		3		(1)		(11)		(9)
Income statement (releases)/charges		(48)		82		53		87
Amounts written-off	—	—	(4)	(4)	(81)	(81)	(85)	(85)
Other movements		—		(1)		(6)		(7)
At 31 December 2018	2,632	36	1,226	118	106	71	3,964	225
Net carrying amount	2,596		1,108		35		3,739	

Key points

- Overall ECL increased primarily due to increased levels of Stage 2 inflows in the first half of the year. This was the result of activity to calibrate and refine the criteria used to identify significant increase in credit risk, with underlying performance stable.
- Transfers from Stage 2 to Stage 1 were higher than in other personal portfolios, primarily due to the ECL assessment period being reset when cards are re-issued.
- ECL transfers from Stage 3 back to the performing book were relatively small as expected.
- The amounts in other (P&L only items) mainly reflected cash recoveries after write-off. These benefited the income statement without affecting ECL.
- Amounts written-off primarily represented charge-offs (analogous to write-off) which typically occurs after 12 missed payments, and also 2018 debt sale activity.

UK PBB - other personal unsecured	Stage 1 Financial assets £m	Stage 1 ECL £m	Stage 2 Financial assets £m	Stage 2 ECL £m	Stage 3 Financial assets £m	Stage 3 ECL £m	Total Financial assets £m	Total ECL £m
At 1 January 2018	4,518	46	1,790	164	705	582	7,013	792
Transfers from Stage 1 to Stage 2	(1,452)	(18)	1,452	18	—	—	—	—
Transfers from Stage 2 to Stage 1	733	42	(733)	(42)	—	—	—	—
Transfers to Stage 3	(51)	(1)	(182)	(50)	233	51	—	—
Transfers from Stage 3	2	—	15	4	(17)	(4)	—	—
Net re-measurement of ECL on stage transfer		(34)		110		114		190
Changes in risk parameters (model inputs)		2		58		(1)		59
Other changes in net exposure	1,325	19	(363)	(11)	(104)	(7)	858	1
Other (P&L only items - primarily fortuitous recoveries)		—		—		(42)		(42)
Income statement (releases)/charges		(13)		157		64		208
Amounts written-off	(2)	(2)	(9)	(9)	(322)	(322)	(333)	(333)
Other movements		—		(3)		(19)		(22)
At 31 December 2018	5,073	54	1,970	239	495	394	7,538	687
Net carrying amount	5,019		1,731		101		6,851	

Key points

- Overall ECL reduction was mainly driven by debt sale activity and business-as-usual write-offs in Stage 3, both reflected in amounts written-off.
- Increases in Stage 2 reflected the underlying performance of recent new business growth maturing. Additionally, the ECL overlay for economic uncertainty contributed to the uplift captured in changes in risk parameters.
- The portfolio continued to experience cash recoveries after write-off, reported in other (P&L only items – primarily fortuitous recoveries). This benefited the income statement without affecting ECL.
- Write-off occurs once recovery activity with the customer has been concluded and there are no further recoveries expected, but no later than six years after default.

Capital and risk management

Credit risk – Banking activities continued

Flow statements (audited)

UK PBB - business banking	Stage 1 Financial assets £m	Stage 1 ECL £m	Stage 2 Financial assets £m	Stage 2 ECL £m	Stage 3 Financial assets £m	Stage 3 ECL £m	Total Financial assets £m	Total ECL £m
At 1 January 2018	6,505	29	684	29	268	224	7,457	282
Transfers from Stage 1 to Stage 2	(691)	(4)	691	4	—	—	—	—
Transfers from Stage 2 to Stage 1	366	12	(366)	(12)	—	—	—	—
Transfers to Stage 3	(35)	(1)	(63)	(8)	98	9	—	—
Transfers from Stage 3	2	2	9	2	(11)	(4)	—	—
Net re-measurement of ECL on stage transfer		(12)		24		43		55
Changes in risk parameters (model inputs)		(6)		2		(11)		(15)
Other changes in net exposure	156	3	(57)	3	(36)	(23)	63	(17)
Other (P&L only items)		—		—		(31)		(31)
Income statement (releases)/charges		(15)		29		(22)		(8)
Amounts written-off	—	—	(1)	(1)	(84)	(84)	(85)	(85)
Other movements		(1)		—		(1)		(2)
At 31 December 2018	6,303	22	897	43	235	153	7,435	218
Net carrying amount	6,281		854		82		7,217	

Key points

- Overall ECL reduction was mainly driven by business-as-usual write-offs in Stage 3.
- Stage 2 ECL did increase during the year as a result of net Stage 2 inflows from Stage 1, partly driven by PD model refinements throughout the year.
- The portfolio continued to experience cash recoveries after write-off, reported in other (P&L only items). This benefited the income statement without affecting ECL.
- Write-off occurs once recovery activity with the customer has been concluded and there are no further recoveries expected, but no later than five years after default.

UK PBB - commercial	Stage 1 Financial assets £m	Stage 1 ECL £m	Stage 2 Financial assets £m	Stage 2 ECL £m	Stage 3 Financial assets £m	Stage 3 ECL £m	Total Financial assets £m	Total ECL £m
At 1 January 2018	6,771	6	595	11	126	57	7,492	74
Currency translation and other adjustments	1	—	—	—	—	—	1	—
Inter-Group transfers	(71)	—	(1)	—	(5)	—	(77)	—
Transfers from Stage 1 to Stage 2	(781)	(2)	781	2	—	—	—	—
Transfers from Stage 2 to Stage 1	389	6	(389)	(6)	—	—	—	—
Transfers to Stage 3	(16)	—	(70)	(1)	86	1	—	—
Transfers from Stage 3	1	—	25	—	(26)	—	—	—
Net re-measurement of ECL on stage transfer		(4)		10		19		25
Changes in risk parameters (model inputs)		4		—		—		4
Other changes in net exposure	(886)	(1)	(123)	(1)	(62)	(6)	(1,071)	(8)
Other (P&L only items)		(2)		1		1		—
Income statement (releases)/charges		(3)		10		14		21
Amounts written-off	—	—	—	—	(27)	(27)	(27)	(27)
Other movements		—		—		(1)		(1)
At 31 December 2018	5,408	9	818	15	92	43	6,318	67
Net carrying amount	5,399		803		49		6,251	

Key point

- Overall ECL reduced slightly during the year, with some modest Stage 1 and Stage 2 ECL increases being more than offset by Stage 3 write-offs, which was the key driver of the overall income statement charge for 2018.

Capital and risk management

Credit risk – Banking activities continued
Flow statements (audited)

Ulster Bank RoI - mortgages	Stage 1 Financial assets £m	Stage 1 ECL £m	Stage 2 Financial assets £m	Stage 2 ECL £m	Stage 3 Financial assets £m	Stage 3 ECL £m	Total Financial assets £m	Total ECL £m
At 1 January 2018	10,650	8	1,532	72	3,167	881	15,349	961
Currency translation and other adjustments	94	—	12	1	15	3	121	4
Transfers from Stage 1 to Stage 2	(344)	(1)	344	1	—	—	—	—
Transfers from Stage 2 to Stage 1	414	7	(414)	(7)	—	—	—	—
Transfers to Stage 3	(32)	—	(124)	(8)	156	8	—	—
Transfers from Stage 3	4	—	245	36	(249)	(36)	—	—
Net re-measurement of ECL on stage transfer		(6)		(4)		11		1
Changes in risk parameters (model inputs)		3		(1)		(23)		(21)
Other changes in net exposure	(4)	—	(188)	(2)	(630)	14	(822)	12
Other (P&L only items)		(2)		2		28		28
Income statement (releases)/charges		(5)		(5)		30		20
Amounts written-off	—	—	(13)	(13)	(322)	(322)	(335)	(335)
Other movements		—		—		(20)		(20)
At 31 December 2018	10,782	11	1,394	75	2,137	516	14,313	602
Net carrying amount	10,771		1,319		1,621		13,711	

Key points
- The overall ECL reduction was driven by reduced ECL in Stage 3, which was subject to significant debt sale activity in 2018 (approximately £0.9 billion of gross exposures were sold during the year).
- In addition to the debt sale activity, the reduction in ECL in Stage 3 reflected ongoing improvements in underlying portfolio performance.
- The reduction in Stage 2 exposures resulted from the portfolio debt sale and decreasing stock of exposures meeting the high-risk backstop criteria. This reflected ongoing improvements in the underlying portfolio performance.
- Write-off generally occurs once the repossessed property has been sold and there is a residual shortfall balance remaining outstanding which has been deemed irrecoverable.

Wholesale

Commercial Banking	Stage 1 Financial assets £m	Stage 1 ECL £m	Stage 2 Financial assets £m	Stage 2 ECL £m	Stage 3 Financial assets £m	Stage 3 ECL £m	Total Financial assets £m	Total ECL £m
At 1 January 2018	84,228	58	9,056	106	3,735	1,156	97,019	1,320
Currency translation and other adjustments	367	—	47	(1)	29	(4)	443	(5)
Inter-Group transfers	(2,106)	(1)	(92)	—	(375)	(14)	(2,573)	(15)
Transfers from Stage 1 to Stage 2	(8,224)	(9)	8,224	9	—	—	—	—
Transfers from Stage 2 to Stage 1	5,911	52	(5,911)	(52)	—	—	—	—
Transfers to Stage 3	(881)	—	(938)	(13)	1,819	13	—	—
Transfers from Stage 3	1,056	11	937	89	(1,993)	(100)	—	—
Net re-measurement of ECL on stage transfer		(57)		13		160		116
Changes in risk parameters (model inputs)		46		8		41		95
Other changes in net exposure	(4,274)	(1)	(2,748)	(19)	(489)	(40)	(7,511)	(60)
Other (P&L only items)		—		1		(8)		(7)
Income statement (releases)/charges		(12)		3		153		144
Amounts written-off	—	—	—	—	(460)	(460)	(460)	(460)
Other movements		—		—		(10)		(10)
At 31 December 2018	76,077	99	8,575	140	2,266	742	86,918	981
Net carrying amount	75,978		8,435		1,524		85,937	

Key points
- ECL reduced over the course of 2018 as write-offs outweighed ECL charges.
- Stage 3 charges were mainly driven by a charge on new to default exposures where the ECL can increase significantly following an individual assessment.
- Stage 1 and Stage 2 changes to risk parameters largely reflected the increase in ECL for economic uncertainty and a change to the forward-looking modelling approach for point-in-time PDs, where PDs now revert to long-run average after one year rather than five years.
- Inter-Group transfers reflected the impact of transfers completed in preparation of ring-fencing. The reductions in net exposure were also related to ring-fencing changes, where short-term borrowing was renewed in other franchises.
- Release in Stage 1 was driven by a reduction in ECL for exposures transferring from Stage 2 and Stage 3, which previously had a lifetime ECL but are now assessed for 12 month ECL.

Credit risk – Banking activities continued

Flow statements (audited)

	Stage 1		Stage 2		Stage 3		Total	
	Financial assets	ECL	Financial assets	ECL	Financial assets	ECL	Financial assets	ECL
NatWest Markets (1)	£m	£m	£m	£m	£m	£m	£m	£m
At 1 January 2018	9,089	2	1,276	42	456	190	10,821	234
Currency translation and other adjustments	252	—	22	(2)	3	3	277	1
Inter-Group transfers	3,590	—	(4)	1	374	14	3,960	15
Transfers from Stage 1 to Stage 2	(393)	—	393	—	—	—	—	—
Transfers from Stage 2 to Stage 1	318	28	(318)	(28)	—	—	—	—
Transfers to Stage 3	—	—	(3)	—	3	—	—	—
Transfers from Stage 3	—	—	35	—	(35)	—	—	—
Net re-measurement of ECL on stage transfer		(26)		5		—		(21)
Changes in risk parameters (model inputs)		(5)		4		—		(1)
Other changes in net exposure	19,902	8	(669)	(8)	(4)	(6)	19,229	(6)
Other (P&L only items - primarily fortuitous recoveries)		—		—		(64)		(64)
Income statement (releases)/charges		(23)		1		(70)		(92)
Amounts written-off	—	—	—	—	(89)	(89)	(89)	(89)
Other movements		—		—		—		—
At 31 December 2018	32,758	7	732	14	708	112	34,198	133
Net carrying amount	32,751		718		596		34,065	

Note:
(1) Reflects NatWest Markets segments and include NWM N.V..

Key points
- Stage 3 financial assets include £166 million (1 January 2018 – £105 million) purchased or originated credit impaired (POCI) assets. No ECL impairment was held on these positions and a £61 million impairment recovery was recognised on these POCI assets during 2018 (included in other (P&L only items – primarily fortuitous recoveries)).
- Stage 1 and Stage 2 changes to risk parameters largely reflected the increase in ECL for economic uncertainty, and a change to the forward-looking modelling approach for point-in-time PDs, where PDs now revert to long run average after one year rather than five years.
- The release in Stage 1 was driven by a reduction in ECL on exposures transferring from Stage 2, which previously had a lifetime ECL but are now assessed for 12 month ECL.
- The increase in Stage 1 exposure was due to a combination of transfers and short-term borrowing to governments and central banks which are now in NatWest Markets following changes in preparation for ring-fencing.
- The portfolio experienced fortuitous recoveries, reported in other (P&L only items – primarily fortuitous recoveries). This benefited the income statement without affecting ECL.

Private Banking								
At 1 January 2018	13,046	18	412	9	300	27	13,758	54
Currency translation and other adjustments	12	—	1	2	—	—	13	2
Inter-Group transfers	23	—	—	—	—	—	23	—
Transfers from Stage 1 to Stage 2	(270)	(1)	270	1	—	—	—	—
Transfers from Stage 2 to Stage 1	92	2	(92)	(2)	—	—	—	—
Transfers to Stage 3	(60)	—	(8)	—	68	—	—	—
Transfers from Stage 3	7	—	1	—	(8)	—	—	—
Net re-measurement of ECL on stage transfer		(2)		3		1		2
Changes in risk parameters (model inputs)		(3)		(2)		1		(4)
Other changes in net exposure	1,100	—	(65)	(1)	(121)	(2)	914	(3)
Other (P&L only items)		—		—		(1)		(1)
Income statement releases		(5)		—		(1)		(6)
Amounts written-off	—	—	—	—	(7)	(7)	(7)	(7)
Other movements		—		—		(1)		(1)
At 31 December 2018	13,950	14	519	10	232	19	14,701	43
Net carrying amount	13,936		509		213		14,658	

Key points
- ECL reduced due to a combination of write-offs and impairment releases.
- The majority of the release was in Stage 1, due to a reduction in loss rates for Retail exposures.
- Exposure increased in Stage 1 reflecting growth in the portfolio (primarily mortgages driven) with minimal ECL impact due to high credit quality.

Capital and risk management

Credit risk – Banking activities continued

Flow statements (audited)

	Stage 1		Stage 2		Stage 3		Total	
	Financial assets	ECL	Financial assets	ECL	Financial assets	ECL	Financial assets	ECL
RBS International	£m	£m	£m	£m	£m	£m	£m	£m
At 1 January 2018	8,652	5	385	5	118	28	9,155	38
Currency translation and other adjustments	98	(2)	—	2	—	(1)	98	(1)
Inter-Group transfers	1,834	—	95	—	—	—	1,929	—
Transfers from Stage 1 to Stage 2	(299)	—	299	—	—	—	—	—
Transfers from Stage 2 to Stage 1	340	5	(340)	(5)	—	—	—	—
Transfers to Stage 3	(14)	—	(11)	—	25	—	—	—
Transfers from Stage 3	190	—	4	—	(194)	—	—	—
Net re-measurement of ECL on stage transfer		(4)		2		—		(2)
Changes in risk parameters (model inputs)		2		—		—		2
Other changes in net exposure	15,948	—	(156)	—	155	(1)	15,947	(1)
Other (P&L only items)		(1)		1		(1)		(1)
Income statement (releases)/charges		(3)		3		(2)		(2)
Amounts written-off	—	—	—	—	(9)	(9)	(9)	(9)
Other movements		—		—		—		—
At 31 December 2018	26,749	6	276	4	95	17	27,120	27
Net carrying amount	26,743		272		78		27,093	

Key points

- The reduction in ECL was driven by write-offs and Stage 3 impairment releases, both of which are primarily in the Spanish mortgage portfolio.
- The increases in exposure were partly due to new lending, but mainly due to the establishment of a liquidity portfolio across central and correspondent banks and sovereign bond holdings. These exposures were in Stage 1 with very low credit risk and contribute minimal ECL.

Credit risk – Banking activities continued

Stage 2 decomposition – arrears status and contributing factors

The tables below summarise Stage 2 decomposition for the Personal and Wholesale portfolios.

	UK mortgages		RoI mortgages		Other mortgages		Credit cards		Other		Total	
31 December 2018	Loans £m	ECL £m	Loans £m	ECL £m	Loans £m	ECL £m	Loans £m	ECL £m	Loans £m	ECL £m	Loans £m	ECL £m
Personal												
Currently in arrears (>30 DPD)	658	10	90	10	3	—	17	6	88	22	856	48
Currently up-to-date	9,612	64	1,292	66	—	—	1,226	114	1,985	225	14,115	469
- PD deterioration	*3,855*	*54*	*680*	*44*	—	—	*778*	*85*	*1,255*	*176*	*6,568*	*359*
- Up-to-date, PD persistence	*1,448*	*5*	*54*	*1*	—	—	*337*	*17*	*440*	*26*	*2,279*	*49*
- Other driver (adverse credit, forbearance etc)	*4,309*	*5*	*558*	*21*	—	—	*111*	*12*	*290*	*23*	*5,268*	*61*
Total Stage 2	10,270	74	1,382	76	3	—	1,243	120	2,073	247	14,971	517

Key point

- In Personal exposures, as expected, ECL coverage was higher on accounts that are more than 30 days past due. Also in line with expectations, accounts exhibiting PD deterioration have a higher ECL coverage than accounts in Stage 2 for other reasons.

	Property		Corporate		FI		Other		Total	
31 December 2018	Loans £m	ECL £m	Loans £m	ECL £m	Loans £m	ECL £m	Loans £m	ECL £m	Loans £m	ECL £m
Wholesale										
Currently in arrears (>30 DPD)	255	7	315	5	1	—	—	—	571	12
Currently up-to-date	1,622	32	8,438	195	473	7	22	—	10,555	234
- PD deterioration	*924*	*23*	*5,564*	*138*	*281*	*6*	*8*	—	*6,777*	*167*
- Up-to-date, PD persistence	*57*	*1*	*170*	*5*	*4*	—	—	—	*231*	*6*
- Other driver (forbearance, RoCL etc.)	*641*	*8*	*2,704*	*52*	*188*	*1*	*14*	—	*3,547*	*61*
Total Stage 2	1,877	39	8,753	200	474	7	22	—	11,126	246

Key point

- In Wholesale exposures, the ECL coverage was broadly consistent in total. Coverage can vary across categories or sectors reflecting the individual characteristics of the customer and exposure type.

Stage 2 decomposition by SICR trigger

	UK mortgages		RoI mortgages		Other mortgages		Credit cards		Other		Total	
31 December 2018	£m	%	£m	%	£m	%	£m	%	£m	%	£m	%
Personal trigger (1)												
PD movement	4,273	41.6	767	55.6	—	—	793	63.8	1,307	63.0	7,140	47.7
PD persistence	1,450	14.1	54	3.9	—	—	338	27.2	440	21.2	2,282	15.2
Adverse credit bureau recorded with credit reference agency	2,996	29.2	—	—	—	—	61	4.9	101	4.9	3,158	21.1
Forbearance support provided	206	2.0	2	0.1	—	—	—	—	13	0.6	221	1.5
Customers in collections	144	1.4	57	4.1	—	—	5	0.4	36	1.7	242	1.6
Other reasons (2)	982	9.6	502	36.3	—	—	46	3.7	151	7.3	1,681	11.2
Days past due >30	219	2.1	—	—	3	100.0	—	—	25	1.2	247	1.6
	10,270	100	1,382	100	3	100	1,243	100	2,073	100	14,971	100

Key point

- The primary driver of credit deterioration was PD, which including persistence, accounted for the majority of movements to Stage 2. High risk back-stops, for example, forbearance, adverse credit bureau, provide additional valuable discrimination particularly on mortgages.

	Property		Corporate		FI		Other		Total	
31 December 2018	£m	%	£m	%	£m	%	£m	%	£m	%
Wholesale trigger (1)										
PD movement	940	50.1	5,617	64.2	281	59.3	8	36.4	6,845	61.5
PD persistence	57	3.0	171	2.0	4	0.8	—	—	232	2.1
Risk of Credit Loss	321	17.1	1,964	22.4	103	21.7	—	—	2,388	21.5
Forbearance support provided	65	3.5	209	2.4	—	—	—	—	274	2.5
Customers in collections	9	0.5	43	0.5	—	—	—	—	52	0.5
Other reasons (3)	251	13.4	525	6.0	85	17.9	14	63.6	875	7.9
Days past due >30	234	12.5	224	2.6	1	0.2	—	—	460	4.1
	1,877	100	8,753	100	474	100	22	100	11,126	100

Notes:

(1) The data table is built on a hierarchical basis from top to bottom, for example, accounts with PD deterioration may also trigger backstop(s) but are only reported under PD deterioration.

(2) Includes customers who have accessed payday lending, interest only mortgages past end of term, a small number of mortgage customers on a highly flexible mortgage significantly behind their outline repayment plan and customers breaching risk appetite thresholds for new business acquisition. On the RoI mortgage portfolio, this reflected customers who remained in probation following the conclusion of forbearance support, exposures breaching risk appetite thresholds for new business acquisition and exposures classified as non-performing exposures under EBA requirements.

(3) Includes customers where a PD assessment cannot be undertaken due to missing PDs.

Key point

- The primary driver of credit deterioration was PD, which including persistence, accounted for 62% of Stage 2. The Risk of Credit Loss framework accounted for a further 21% highlighting the importance of expert judgement being used to identify deterioration.

Credit risk – Banking activities continued

Stage 3 vintage analysis

The table below provides estimated vintage analysis of the material Stage 3 portfolios totalling 87% of the Stage 3 loans of £7.7 billion.

2018	UK PBB mortgages	Ulster RoI mortgages	Wholesale
Stage 3 loans (£bn)	1.2	2.1	3.4
Vintage (time in default):			
<1 year	26%	7%	22%
1-3 years	21%	12%	19%
3-5 years	14%	14%	9%
5-10 years	35%	63%	50%
>10 years	4%	4%	—
	100%	100%	100%

Key points

- Mortgages – The proportion of the Stage 3 defaulted population who have been in default for over five years reflected RBS's support for customers in financial difficulty. When customers continue to engage constructively with RBS making regular payments, RBS continues to support them. RBS's provisioning approach retains customers in Stage 3 for a life-time loss provisioning calculation even when their arrears status reverts to below 90 days past due.
- Wholesale – The value of Stage 3 loans that have been impaired for 5-10 years was mainly due to customers being in a protracted formal insolvency process or subject to litigation or a complaints process.

Asset quality (audited)

Asset quality analysis is based on internal asset quality ratings which have ranges for the probability of default. Customers are assigned credit grades, based on various credit grading models that reflect the key drivers of default for the customer type. All credit grades across RBS map to both an asset quality scale, used for external financial reporting, and a master grading scale for wholesale exposures used for internal management reporting across portfolios. The table that follows details the relationship between internal asset quality (AQ) bands and external ratings published by Standard & Poor's (S&P), for illustrative purposes only. This relationship is established by observing S&P's default study statistics, notably the one year default rates for each S&P rating grade. A degree of judgement is required to relate the probability of default ranges associated with the master grading scale to these default rates given that, for example, the S&P published default rates do not increase uniformly by grade and the historical default rate is nil for the highest rating categories.

Internal asset quality band	Probability of default range	Indicative S&P rating
AQ1	0% - 0.034%	AAA to AA
AQ2	0.034% - 0.048%	AA to AA-
AQ3	0.048% - 0.095%	A+ to A
AQ4	0.095% - 0.381%	BBB+ to BBB-
AQ5	0.381% - 1.076%	BB+ to BB
AQ6	1.076% - 2.153%	BB- to B+
AQ7	2.153% - 6.089%	B+ to B
AQ8	6.089% - 17.222%	B- to CCC+
AQ9	17.222% - 100%	CCC to C
AQ10	100%	D

The mapping to the S&P ratings is used by RBS as one of several benchmarks for its wholesale portfolios, depending on customer type and the purpose of the benchmark. The mapping is based on all issuer types rated by S&P. It should therefore be considered illustrative and does not, for instance, indicate that exposures reported against S&P ratings either have been or would be assigned those ratings if assessed by S&P. In addition, the relationship is not relevant for retail portfolios, smaller corporate exposures or specialist corporate segments given that S&P does not typically assign ratings to such entities.

Credit risk – Banking activities continued

Asset quality (audited)

The table below summarises asset quality bands of gross loans and ECL by stage for the Personal portfolio.

	Gross loans				ECL provisions				ECL provisions coverage			
2018	Stage 1 £m	Stage 2 £m	Stage 3 £m	Total £m	Stage 1 £m	Stage 2 £m	Stage 3 £m	Total £m	Stage 1 %	Stage 2 %	Stage 3 %	Total %
UK mortgages												
AQ1-AQ4	95,618	3,621		99,239	6	11		17	0.01	0.30		0.02
AQ5-AQ8	42,771	5,845		48,616	6	46		52	0.01	0.79		0.11
AQ9	32	804		836	—	17		17	—	2.11		2.03
AQ10			1,541	1,541			151	151			9.80	9.80
	138,421	10,270	1,541	150,232	12	74	151	237	0.01	0.72	9.80	0.16
RoI mortgages												
AQ1-AQ4	5,164	226		5,390	4	5		9	0.08	2.21		0.17
AQ5-AQ8	5,668	717		6,385	7	32		39	0.12	4.46		0.61
AQ9	12	439		451	—	39		39	—	8.88		8.65
AQ10 (1)			2,124	2,124			515	515			24.25	24.25
	10,844	1,382	2,124	14,350	11	76	515	602	0.10	5.50	24.25	4.20
Other mortgages												
AQ1-AQ4	359	1		360	—	—		—	—	—		—
AQ5-AQ8	136	2		138	—	—		—	—	—		—
AQ10			1	1			—				—	—
	495	3	1	499	—	—	—	—	—	—	—	—
Credit cards												
AQ1-AQ4	34	1		35	—	—		—	—	—		—
AQ5-AQ8	2,810	1,180		3,990	38	103		141	1.35	8.73		3.53
AQ9	7	62		69	—	17		17	—	27.42		24.64
AQ10			122	122			72	72			59.02	59.02
	2,851	1,243	122	4,216	38	120	72	230	1.33	9.65	59.02	5.46
Other												
AQ1-AQ4	997	43		1,040	4	5		9	0.40	11.63		0.87
AQ5-AQ8	5,889	1,847		7,736	55	186		241	0.93	10.07		3.12
AQ9	56	183		239	2	56		58	3.57	30.60		24.27
AQ10			563	563			420	420			74.60	74.60
	6,942	2,073	563	9,578	61	247	420	728	0.88	11.92	74.60	7.60
Total												
AQ1-AQ4	102,172	3,892		106,064	14	21		35	0.01	0.54		0.03
AQ5-AQ8	57,274	9,591		66,865	106	367		473	0.19	3.83		0.71
AQ9	107	1,488		1,595	2	129		131	1.87	8.67		8.21
AQ10			4,351	4,351			1,158	1,158			26.61	26.61
	159,553	14,971	4,351	178,875	122	517	1,158	1,797	0.08	3.45	26.61	1.00

Note:
(1) At 31 December 2018, AQ10 includes £0.6 billion RoI mortgages which are not currently considered defaulted for capital calculation purposes for RoI but included in Stage 3.

Key points

- The majority of exposures were in AQ1-AQ4, with a significant proportion in AQ5-AQ8. As expected, mortgage exposures have a higher proportion in AQ1-AQ4 than unsecured borrowing.
- The relatively high level of Stage 3 impaired assets (AQ10) in RoI mortgages reflected their legacy mortgage portfolio and the residual effects from the financial crisis. In other personal, the relatively high level of exposures in AQ10 reflected the fact that impaired assets can be held on balance sheet with commensurate ECL provision for up to six years after default.
- ECL provisions coverage shows the expected trend with increased coverage in the poorer asset quality bands, and also by stage.

Capital and risk management

Credit risk – Banking activities continued

Asset quality (audited)

The table below summarises asset quality bands of gross loans and ECL by stage for the Wholesale portfolio.

	Gross loans				ECL provisions				ECL provisions coverage			
2018	Stage 1 £m	Stage 2 £m	Stage 3 £m	Total £m	Stage 1 £m	Stage 2 £m	Stage 3 £m	Total £m	Stage 1 %	Stage 2 %	Stage 3 %	Total %
Property												
AQ1-AQ4	15,740	393		16,133	8	9		17	0.05	2.29		0.11
AQ5-AQ8	17,397	1,418		18,815	35	26		61	0.20	1.83		0.32
AQ9	8	66		74	—	4		4	—	6.06		5.41
AQ10			1,685	1,685			506	506			30.03	30.03
	33,145	1,877	1,685	36,707	43	39	506	588	0.13	2.08	30.03	1.60
Corporate												
AQ1-AQ4	21,814	773		22,587	13	14		27	0.06	1.81		0.12
AQ5-AQ8	40,004	7,647		47,651	93	171		264	0.23	2.24		0.55
AQ9	26	333		359	1	15		16	3.85	4.50		4.46
AQ10			1,643	1,643			634	634			38.59	38.59
	61,844	8,753	1,643	72,240	107	200	634	941	0.17	2.28	38.59	1.30
Financial institutions												
AQ1-AQ4	22,150	247		22,397	5	5		10	0.02	2.02		0.04
AQ5-AQ8	2,352	222		2,574	7	2		9	0.30	0.90		0.35
AQ9	—	5		5	—	—		—	—	—		—
AQ10			35	35			22	22			62.86	62.86
	24,502	474	35	25,011	12	7	22	41	0.05	1.48	62.86	0.16
Sovereign												
AQ1-AQ4	6,780	22		6,802	1	—		1	0.01	—		0.01
AQ5-AQ8	161	—		161	—	—		—	—	—		—
AQ10			4	4			—	—			—	—
	6,941	22	4	6,967	1	—	—	1	0.01	—	—	0.01
Total												
AQ1-AQ4	66,484	1,435		67,919	27	28		55	0.04	1.95		0.08
AQ5-AQ8	59,914	9,287		69,201	135	199		334	0.23	2.14		0.48
AQ9	34	404		438	1	19		20	2.94	4.70		4.57
AQ10			3,367	3,367			1,162	1,162			34.51	34.51
	126,432	11,126	3,367	140,925	163	246	1,162	1,571	0.13	2.21	34.51	1.11

Key points

- Across the Wholesale portfolio, the asset quality band distribution differed reflecting the diverse nature of differing sectors. 48% of Wholesale lending exposure was in the AQ1-AQ4 band.
- The relatively low provision coverage for Stage 3 loans in the property sector reflected the secured nature of the exposures.

Credit risk – Trading activities

This section covers the credit risk profile of RBS's trading activities. All disclosures are audited.

Security funding transactions and collateral (audited)

The table below captures securities funding transactions in NWM and Treasury. All transactions that are outside netting arrangements are in NWM.

	Reverse repos			Repos		
2018	Total £m	Of which: can be offset £m	Outside netting arrangements £m	Total £m	Of which: can be offset £m	Outside netting arrangements £m
Gross	68,044	65,057	2,987	70,097	68,940	1,157
IFRS offset	(39,737)	(39,737)	—	(39,737)	(39,737)	—
Carrying value	28,307	25,320	2,987	30,360	29,203	1,157
Master netting arrangements	(762)	(762)	—	(762)	(762)	—
Securities collateral	(24,548)	(24,548)	—	(28,441)	(28,441)	—
Potential for offset not recognised under IFRS	(25,310)	(25,310)	—	(29,203)	(29,203)	—
Net	2,997	10	2,987	1,157	—	1,157
2017						
Gross	84,706	78,991	5,715	82,395	80,088	2,307
IFRS offset	(43,974)	(43,974)	—	(43,974)	(43,974)	—
Carrying value	40,732	35,017	5,715	38,421	36,114	2,307
Master netting arrangements	(329)	(329)	—	(329)	(329)	—
Securities collateral	(34,646)	(34,646)	—	(35,785)	(35,785)	—
Potential for offset not recognised under IFRS	(34,975)	(34,975)	—	(36,114)	(36,114)	—
Net	5,757	42	5,715	2,307	—	2,307

Credit risk – Trading activities continued

Derivatives (audited)

The table below summarises derivatives by type of contract. The master netting agreements and collateral shown below do not result in a net presentation on the balance sheet under IFRS 9. A significant proportion (more than 90%) of the derivatives relate to trading activities in NatWest Markets, the table below also includes hedging derivatives in Treasury.

	2018							2017		
	Notional									
	GBP £bn	USD £bn	Euro £bn	Other £bn	Total £bn	Assets £m	Liabilities £m	Notional £bn	Assets £m	Liabilities £m
Gross exposure						138,390	135,673		177,931	172,063
IFRS offset						(5,041)	(6,776)		(17,088)	(17,557)
Carrying value	2,895	5,129	4,323	1,632	13,979	133,349	128,897	15,482	160,843	154,506
Of which:										
Interest rate (1)										
Interest rate swaps						81,855	74,004		99,065	91,025
Options purchased						14,481	—		21,733	—
Options written						—	16,371		—	21,021
Futures and forwards						74	69		147	114
Total	2,521	3,589	3,686	740	10,536	96,410	90,444	12,016	120,945	112,160
Exchange rate										
Spot, forwards and futures						17,904	18,610		19,283	19,172
Currency swaps						11,322	12,062		11,163	13,534
Options purchased						7,319	—		8,765	—
Options written						—	7,558		—	8,975
Total	373	1,532	629	892	3,426	36,545	38,230	3,425	39,211	41,681
Credit	1	7	8	—	16	346	208	38	531	558
Equity and commodity	—	1	—	—	1	48	15	3	156	107
Carrying value					13,979	133,349	128,897	15,482	160,843	154,506
Counterparty mark-to-market netting						(106,762)	(106,762)		(128,287)	(128,287)
Cash collateral						(17,937)	(15,227)		(20,311)	(18,035)
Securities collateral						(4,469)	(3,466)		(5,850)	(3,952)
Net exposure						4,181	3,442		6,395	4,232
Of which outside netting arrangements						*2,061*	*1,708*		*2,261*	*1,658*
Banks (2)						362	443		461	466
Other financial institutions (3)						1,054	1,144		1,608	1,625
Corporate (4)						2,510	1,817		3,843	2,065
Government (5)						255	38		483	76
Net exposure						4,181	3,442		6,395	4,232
UK						1,935	1,304		4,079	1,853
Europe						1,308	1,465		1,643	1,777
US						588	298		346	317
RoW						350	375		327	285
Net exposure						4,181	3,442		6,395	4,232

Asset quality of uncollateralised derivative assets	2018 Assets £m	2017 Assets £m
AQ1-AQ4	3,384	5,173
AQ5-AQ8	773	1,216
AQ9	3	3
AQ10	21	3
Net exposure	4,181	6,395

Notes:
(1) The notional amount of interest rate derivatives include £5,952 billion (2017 – £7,400 billion) in respect of contracts cleared through central clearing counterparties.
(2) Transactions with certain counterparties with whom RBS has netting arrangements but collateral is not posted on a daily basis; certain transactions with specific terms that may not fall within netting and collateral arrangements; derivative positions in certain jurisdictions for example China where the collateral agreements are not deemed to be legally enforceable.
(3) Transactions with securitisation vehicles and funds where collateral posting is contingent on RBS's external rating.
(4) Mainly large corporates with whom RBS may have netting arrangements in place, but operational capability does not support collateral posting.
(5) Sovereigns and supranational entities with one-way collateral agreements in their favour.

Credit risk – Trading activities continued

Derivatives: settlement basis and central counterparties (audited)

The table below summarises the derivative notional and fair value by trading and settlement method.

	Notional				Asset		Liability	
		Traded over the counter						
	Traded on recognised exchanges	Settled by central counterparties	Not settled by central counterparties	Total	Traded on recognised exchanges	Traded over the counter	Traded on recognised exchanges	Traded over the counter
2018	£bn	£bn	£bn	£bn	£m	£m	£m	£m
Interest rate	1,642	5,952	2,942	10,536	—	96,410	—	90,444
Exchange rate	4	—	3,422	3,426	—	36,545	—	38,230
Credit	—	—	16	16	—	346	—	208
Equity and commodity	—	—	1	1	—	48	—	15
Total	1,646	5,952	6,381	13,979	—	133,349	—	128,897
2017								
Interest rate	1,506	7,400	3,110	12,016	—	120,945	—	112,160
Exchange rate	4	—	3,421	3,425	—	39,211	—	41,681
Credit	—	—	38	38	—	531	—	558
Equity and commodity	—	—	3	3	—	156	1	106
Total	1,510	7,400	6,572	15,482	—	160,843	1	154,505

Debt securities (audited)

The table below summarises debt securities held at mandatory fair value through profit or loss by issuer as well as ratings based on the lowest of Standard & Poor's, Moody's and Fitch. A significant proportion (more than 95%) of these positions are trading securities in NatWest Markets.

	Central and local government			Financial institutions	Corporate	Total
	UK	US	Other			
2018	£m	£m	£m	£m	£m	£m
AAA	—	—	2,093	1,459	7	3,559
AA to AA+	6,834	4,689	3,161	773	120	15,577
A to AA-	—	—	4,571	482	51	5,104
BBB- to A-	—	—	3,592	802	285	4,679
Non-investment grade	—	—	81	832	237	1,150
Unrated	—	—	—	572	8	580
Total	6,834	4,689	13,498	4,920	708	30,649
Short positions	(6,394)	(2,008)	(13,500)	(1,724)	(201)	(23,827)
2017						
AAA	—	—	1,474	1,576	21	3,071
AA to AA+	3,514	3,667	2,386	984	168	10,719
A to AA-	—	—	7,224	427	78	7,729
BBB- to A-	—	—	3,267	796	493	4,556
Non-investment grade	—	—	385	552	171	1,108
Unrated	—	—	—	255	43	298
Total	3,514	3,667	14,736	4,590	974	27,481
Short positions	(3,490)	(2,501)	(20,390)	(1,945)	(201)	(28,527)

Credit risk – Cross border exposure

Cross border exposures comprise both banking and trading activities, including reverse repurchase agreements. Exposures comprise loans and advances, including finance leases and instalment credit receivables, and other monetary assets, such as debt securities. The geographical breakdown is based on the country of domicile of the borrower or guarantor of ultimate risk. Cross border exposures include non-local currency claims of overseas offices on local residents but exclude exposures to local residents in local currencies. The table below sets out cross border exposures greater than 0.5% of RBS's total assets.

	Government	Banks	Other	Total	Short positions	Net of short positions
2018	£m	£m	£m	£m	£m	£m
Western Europe	21,121	19,003	16,741	56,865	14,103	42,762
Of which: France	3,396	10,209	1,579	15,184	1,626	13,558
Of which: Germany	8,023	3,086	1,145	12,254	5,397	6,857
Of which: Netherlands	1,142	675	3,739	5,556	985	4,571
United States	13,558	5,458	8,379	27,395	2,103	25,292
Japan	4,857	2,327	405	7,589	11	7,578
2017						
France	4,721	11,739	2,320	18,780	3,324	15,456
Germany	7,643	5,819	2,165	15,627	9,957	5,670
Netherlands	1,897	798	5,395	8,090	986	7,104
United States	8,697	4,494	8,048	21,239	2,607	18,632
Japan	7,533	4,879	197	12,609	15	12,594
2016						
France	4,275	7,045	2,003	13,323	2,392	10,931
Germany	8,868	4,836	2,138	15,842	4,207	11,635
Netherlands	2,809	563	6,699	10,071	1,061	9,010
United States	7,677	6,012	8,138	21,827	5,099	16,728
Japan	8,291	5,441	375	14,107	1	14,106

Credit risk continued

Key IFRS 9 terms and differences to the prior IAS accounting standard and regulatory framework (audited)

Attribute	IFRS 9	IAS 39	Regulatory (CRR)
Default/credit impairment	To determine the risk of a default occurring, management applies a default definition that is consistent with the Basel/regulatory definition of default. Assets that are defaulted are shown as credit impaired. RBS uses 90 days past due as a consistent measure for default across all product classes. The population of credit impaired assets is broadly consistent with IAS 39, though measurement differs because of the application of MES. Assets that were categorised as potential problems with no impairment provision are now categorised as Stage 3.	Default aligned to loss events, all financial assets where an impairment event had taken place – 100% probability of default and an internal asset quality grade of AQ10 – were classed as non-performing. Impaired financial assets were those for which there was objective evidence that the amount or timing of future cash flows had been adversely impacted since initial recognition.	A default shall be considered to have occurred with regard to a particular financial asset when either or both of the following have taken place: — RBS considers that the customer is unlikely to pay its credit obligations without recourse by the institution to actions such as realising security; — The customer is past due more than 90 days. For Personal exposures, the definition of default may be applied at the level of an individual credit facility rather than in relation to the total obligations of a borrower.
Probability of default (PD)	PD is the likelihood of default assessed on the prevailing economic conditions at the reporting date (point in time), adjusted to take into account estimates of future economic conditions that are likely to impact the risk of default; it will not equate to a long run average.	Regulatory PDs adjusted to point in time metrics were used in the latent provision calculation.	The likelihood that a customer will fail to make full and timely repayment of credit obligations over a one year time horizon. For Wholesale, PD models reflect losses that would arise through-the-cycle; this represents a long run average view of default levels. For Personal, the prevailing economic conditions at the reporting date (point-in-time) are used.
Significant increase in credit risk (SICR)	A framework incorporating both quantitative and qualitative measures aligned to the Group's current risk management framework has been established. Credit deterioration will be a management decision, subject to approval by governing bodies such as the Provisions Committee. The staging assessment requires a definition of when a SICR has occurred; this moves the loss calculation for financial assets from a 12 month horizon to a lifetime horizon. Management has established an approach that is primarily informed by the increase in lifetime probability of default, with additional qualitative measures to account for assets where PD does not move, but a high risk factor is determined.	Not applicable.	Not applicable.
Forward-looking and multiple scenarios	The evaluation of future cash flows, the risk of default and impairment loss should take into account expectations of economic changes that are reasonable. More than one outcome should be considered to ensure that the resulting estimation of impairment is not biased towards a particular expectation of economic growth.	Financial asset carrying values based upon the expectation of future cash flows.	Not applicable.

Credit risk continued

Key IFRS 9 terms and differences to the prior IAS accounting standard and regulatory framework (audited)

Attribute	IFRS 9	IAS 39	Regulatory (CRR)
Loss given default (LGD)	LGD is a current assessment of the amount that will be recovered in the event of default, taking account of future conditions. It may occasionally equate to the regulatory view albeit with conservatism and downturn assumptions generally removed.	Regulatory LGD values were often used for calculating collective and latent provisions; bespoke LGDs were also used.	An estimate of the amount that will not be recovered in the event of default, plus the cost of debt collection activities and the delay in cash recovery. LGD is a downturn based metric, representing a prudent view of recovery in adverse economic conditions.
Exposure at default (EAD)	Expected balance sheet exposure at default. It differs from the regulatory method as follows: — It includes the effect of amortisation; and — It caps exposure at the contractual limit.	Based on the current drawn balance plus future committed drawdowns.	Models are used to provide estimates of credit facility utilisation at the time of a customer default, recognising that customers may make further drawings on unused credit facilities prior to default or that exposures may increase due to market movements. EAD cannot be lower than the reported balance sheet, but can be reduced by a legally enforceable netting agreement.
Date of initial recognition	The reference date used to assess a significant increase in credit risk is as follows. Term lending: the date the facility became available to the customer. Wholesale revolving products: the date of the last substantive credit review (typically annual) or, if later, the date facility became available to the customer. Retail Cards: the account opening date or, if later, the date the card was subject to a regular three year review or the date of any subsequent limit increases. Current accounts/overdrafts: the account opening date or, if later, the date of initial granting of overdraft facility or of limit increases.	Not applicable for impairment but defined as the date when the entity becomes a party to the contractual provisions of the instrument.	Not applicable.
Modification	A modification occurs when the contractual cash flows of a financial asset are renegotiated or otherwise modified and the renegotiation or modification does not result in derecognition. A modification requires immediate recognition in the income statement of any impact on the carrying value and effective interest rate (EIR) or examples of modification events include forbearance and distressed restructuring. The financial impact is recognised in the income statement as an impairment release/(loss).	Modification was not separately defined but accounting impact arose as an EIR adjustment on changes that were not derecognition or impairment events.	Not applicable.

Market risk
RBS is exposed to non-traded market risk through its banking activities and to traded market risk through its trading activities. Non-traded and traded market risk exposures are managed separately. As a result, each type of market risk is discussed separately. The non-traded market risk section begins below. The traded market risk section begins on page 157.

Pension-related activities also give rise to market risk. Refer to page 160 for more information on risk related to pensions.

Non-traded market risk
Definition
Non-traded market risk is the risk to the value of assets or liabilities outside the trading book, or the risk to income, that arises from changes in market prices such as interest rates, foreign exchange rates and equity prices, or from changes in managed rates.

The following disclosures in this section are audited:
- Internal banking book VaR.
- Foreign exchange risk.
- Equity risk.

Sources of risk
RBS's non-traded market risk exposure is largely managed in line with the following key categories: interest rate risk; credit spread risk; foreign exchange risk; equity risk; and accounting volatility risk.

Interest rate risk
Non-traded interest rate risk (NTIRR) arises from the provision to customers of a range of banking products with differing interest rate characteristics. When aggregated, these products form portfolios of assets and liabilities with varying degrees of sensitivity to changes in market interest rates. Mismatches can give rise to volatility in net interest income as interest rates vary. NTIRR comprises three primary risk types: gap risk, basis risk and option risk.

Credit spread risk
Credit spread risk arises from the potential adverse economic impact of a change in the spread between bond yields and swap rates, where the bond portfolios are accounted at fair value through equity.

Foreign exchange risk
Non-traded foreign exchange risk arises from two main sources:
- Structural foreign exchange risk – arises from the capital deployed in foreign subsidiaries, branches and joint arrangements and related currency funding where it differs from sterling.
- Non-trading book foreign exchange risk – arises from customer transactions and profits and losses that are in a currency other than the functional currency of the transacting operation.

Equity risk
Non-traded equity risk is the potential variation in income and reserves arising from changes in the values of equity positions. Equity exposures may arise through strategic acquisitions, venture capital investments and certain restructuring arrangements.

Accounting volatility risk
Accounting volatility risk arises when an exposure is accounted for at amortised cost but economically hedged by a derivative that is accounted for at fair value. Although this is not an economic risk, the difference in accounting between the exposure and the hedge creates volatility in the income statement.

Key developments in 2018
- Interest rates rose in 2018 but remained low by historical standards. The UK base rate rose from 0.5% to 0.75% in August 2018. The five-year swap rate was 1.22% at 31 December 2018 compared to 0.98% at 31 December 2017.
- Sterling weakened against the US dollar and slightly against the euro over the year.
- The persistence of low interest rates and weaker sterling partly reflected uncertainty over Brexit.
- Compliance with ring-fencing regulations resulted in the split of non-traded market risk management responsibility for NatWest Holdings and its subsidiaries from non-ring-fenced companies.
- Changes in accounting treatment under IFRS 9, which took effect from 1 January 2018, had an impact on the way certain non-traded market risk exposures are calculated. Some structured loans were recognised at fair value through the profit and loss on transition to IFRS 9. However, this exposure had declined by the end of the year, mainly due to asset disposals.

Risk governance
Responsibility for identifying, measuring, monitoring and controlling market risk arising from non-trading activities lies with the relevant business. Oversight is provided by the independent Risk function.

Risk positions are reported monthly to the Executive Risk Committee and quarterly to the Board Risk Committee, as well as to the Asset & Liability Management Committee (monthly in the case of interest rate, credit spread and accounting volatility risks and quarterly in the case of foreign exchange and equity risks).

Market risk policy statements set out the governance and risk management framework.

Risk appetite
RBS's qualitative appetite is set out in the non-traded market risk appetite statement.

Its quantitative appetite is expressed in terms of value-at-risk (VaR), stressed value-at-risk (SVaR), sensitivity and stress limits, and earnings-at-risk limits. These limits comprise both board risk measures (which are approved by the RBS Board on the recommendation of the Board Risk Committee) and key risk measures, which are approved by the Asset & Liability Management Committee.

The limits are reviewed to reflect changes in risk appetite, business plans, portfolio composition and the market and economic environments.

To ensure approved limits are not breached and that RBS remains within its risk appetite, triggers at RBS and lower levels have been set and are actively managed.

For further information on risk appetite, refer to page 92.

Risk controls
For information on risk controls, refer to page 92.

Risk monitoring and mitigation
Interest rate risk
NTIRR factors are grouped into the following categories:
- Gap risk – arises from the timing of rate changes in non-trading book instruments. The extent of gap risk depends on whether changes to the term structure of interest rates occur consistently across the yield curve (parallel risk) or differentially by period (non-parallel risk).
- Basis risk – captures the impact of relative changes in interest rates for financial instruments that have similar tenors but are priced using different interest rate indices, or on the same interest rate indices but with different tenors.
- Option risk – arises from option derivative positions or from optional elements embedded in assets, liabilities and/or off-balance sheet items, where RBS or its customer can alter the level and timing of their cash flows. Option risk also includes pipeline risk.

Due to the long-term nature of many retail and commercial portfolios – and their varied interest rate repricing characteristics and maturities – net interest income is likely to vary from period to period, even if interest rates remain the same. New business originated in any period will alter RBS's interest rate sensitivity if the resulting portfolio differs

Non-traded market risk continued

from portfolios originated in prior periods, depending on the extent to which exposure has been hedged. To manage exposures within appetite, RBS aggregates its interest rate positions and hedges these externally using cash and derivatives (primarily interest rate swaps).

Credit spread risk

RBS's bond portfolios primarily comprise high-quality securities maintained as a liquidity buffer to ensure RBS can continue to meet its obligations in the event that access to wholesale funding markets is restricted. Additionally other high-quality bond portfolios are held for collateral purposes and to support payment systems.

Credit spread risk is monitored daily through sensitivities and VaR measures. The dealing authorities in place for the bond portfolios further mitigate the risk by imposing constraints by duration, asset class and credit rating. Exposures and limit utilisations are reported to senior management on a daily basis.

Foreign exchange risk

The only material non-traded open currency positions are the structural foreign exchange exposures arising from investments in foreign subsidiaries, branches and associates and their related currency funding. These exposures are assessed and managed to predefined risk appetite levels under delegated authority from the Asset & Liability Management Committee. RBS seeks to limit the potential volatility impact on its CET1 ratio from exchange rate movements by maintaining a structural open currency position. Gains or losses arising from the retranslation of net investments in overseas operations are recognised in equity reserves and reduce the sensitivity of capital ratios to foreign exchange rate movements primarily arising from the retranslation of non-sterling-denominated RWAs. Sensitivity is minimised where, for a given currency, the ratio of the structural open position to RWAs equals the CET1 ratio.

The sensitivity of this ratio to exchange rates is monitored monthly and reported to the Asset & Liability Management Committee at least quarterly. Foreign exchange exposures arising from customer transactions are sold down by businesses on a regular basis in line with RBS policy.

Equity risk

Non-traded equity risk is the potential variation in the income and reserves arising from changes in equity valuations. Any such risk is identified prior to any investments and then mitigated through a framework of controls.

Investments, acquisitions or disposals of a strategic nature are referred to the Acquisitions & Disposals Committee. Once approved by the Acquisitions & Disposals Committee for execution, such transactions are referred for approval to the Board, the Executive Committee, the Chief Executive, the Chief Financial Officer or as otherwise required. Decisions to acquire or hold equity positions in the non-trading book that are not of a strategic nature, such as customer restructurings, are taken by authorised persons with delegated authority under the credit approval framework.

Accounting volatility risk

Accounting volatility can be mitigated through hedge accounting. The profit and loss impact of the derivatives can be mitigated by marking the exposure to market. However, volatility will remain in cases where accounting rules mean that hedge accounting is not an option. Accounting volatility risk is reported to the Asset & Liability Management Committee monthly and capitalised as part of the Internal Capital Adequacy Assessment Process.

Risk measurement

The market risk exposures arising as a result of RBS's retail and commercial banking activities are measured using a combination of value-based metrics (VaR and sensitivities) and earnings-based metrics, as explained in greater detail for each of the exposure types discussed in this section. The following table presents one-day internal banking book VaR at a 99% confidence level, split by risk type.

	2018				2017			
	Average £m	Maximum £m	Minimum £m	Period end £m	Average £m	Maximum £m	Minimum £m	Period end £m
Interest rate	14.4	28.2	7.3	11.6	9.1	15.3	5.6	5.6
Euro	2.1	3.9	1.0	1.0	3.3	4.3	2.3	3.3
Sterling	14.5	26.0	7.9	13.3	6.3	13.8	1.8	2.8
US dollar	4.7	8.7	1.4	8.7	5.5	8.8	2.1	7.7
Other	0.5	0.7	0.3	0.7	1.0	1.1	0.8	0.8
Credit spread	59.7	77.8	49.4	77.8	60.6	82.4	47.4	49.7
Structural foreign exchange rate	13.4	32.7	5.9	13.0	12.4	17.2	9.3	15.4
Pipeline risk (1)	0.6	1.3	0.3	0.4	0.9	1.7	0.2	1.0
Diversification (2)	(24.9)			(20.5)	(19.2)			(17.3)
Total	63.0	82.3	54.9	82.3	63.8	83.1	54.4	54.4

Notes:
(1) Pipeline risk is the risk of loss arising from personal customers owning an option to draw down a loan – typically a mortgage – at a committed rate, where interest rate changes may result in greater or fewer customers than anticipated taking up the committed offer.
(2) RBS benefits from diversification across various financial instrument types, currencies and markets. The extent of the diversification benefit depends on the correlation between the assets and risk factors in the portfolio at a particular time. The diversification factor is the sum of the VaR on individual risk types less the total portfolio VaR.

Key points (audited)

- On average, non-traded VaR remained broadly unchanged year on year.
- The main component of the VaR is credit spread risk. VaR peaked at year-end, mainly driven by higher volatility in credit spreads due to economic uncertainty that affected the UK Gilts portfolio.
- Interest rate VaR peaked in January driven by the impact of transition to IFRS 9 on interest rate exposure in the structured loan portfolio. It subsequently declined, driven by additional hedging put in place during H1 2018 and asset disposals during H2 2018.
- Structural foreign exchange rate VaR peaked in H1 2018. The VaR measures the residual spot sensitivity of the CET1 ratio to exchange rate movements. CET1 ratio sensitivity to the sterling/US dollar exchange rate increased in May when foreign exchange rate options were exercised to hedge additional US dollar liabilities that were recognised when the agreement in principle with the US Department of Justice was reached.

Non-traded market risk continued

Structural hedging

RBS has the benefit of a significant pool of stable, non and low interest-bearing liabilities, principally comprising equity and money transmission accounts. These balances are usually hedged, either by investing directly in longer-term fixed-rate assets (such as fixed-rate mortgages or UK government Gilts) or by using interest rate swaps, which are generally booked as cash flow hedges of floating-rate assets, in order to provide a consistent and predictable revenue stream.

After hedging the net interest rate exposure externally, RBS allocates income to equity or products in structural hedges by reference to the relevant interest rate swap curve. Over time, this approach has provided a basis for stable income attribution to products and interest rate returns. The programme aims to track a time series of medium-term swap rates, but the yield will be affected by changes in product volumes and RBS's capital composition.

The table below presents the incremental income allocation (above three-month LIBOR), total income allocation (including three-month LIBOR), the period end and average notional balances and the total yield (including three-month LIBOR) associated with the structural hedges managed by RBS.

	2018					2017				
	Incremental income £m	Total income £m	Period end notional £bn	Average notional £bn	Total yield %	Incremental income £m	Total income £m	Period end notional £bn	Average notional £bn	Total yield %
Equity structural hedging	469	672	29	29	2.33	628	703	28	28	2.48
Product structural hedging	368	1,104	110	108	1.02	680	1,027	107	101	1.02
Other structural hedges	89	167	22	22	0.77	147	165	21	20	0.83
Total	926	1,943	161	159	1.22	1,455	1,895	156	149	1.27

Equity structural hedges refer to income allocated primarily to equity and reserves. This includes NatWest Markets Plc and NatWest Holdings. Product structural hedges refer to income allocated to customer products, for example current accounts, in NatWest Holdings. Other structural hedges refer to hedges managed by the subsidiaries (Private Banking, Ulster Bank Limited, UBIDAC and RBSI). A significant proportion of Other structural hedges are euro-denominated.

The table below presents the incremental income associated with product structural hedges at segment level.

	2018 £m	2017 £m
UK Personal & Business Banking	242	440
Commercial Banking	124	235
Other	2	5
Total	368	680

Key points

- The incremental income from the structural hedge was lower than that in 2017 primarily due to the increase in three-month LIBOR during 2018. The overall yield of the hedge was relatively stable.
- Five-year and ten-year sterling swap rates at 31 December 2018 were 1.22% and 1.35%, respectively. Equity structural hedges amortise over ten years whilst product hedges amortise over five years. Other structural hedges also amortise over five years except a small proportion of RBSI's hedge which amortises over ten years.
- Compliance with ring-fencing regulations during H2 2018 resulted in a split of the equity structural hedge between NatWest Holdings and NatWest Markets. Approximately £6 billion of the equity hedge was allocated to NWM Plc in 2018.
- Additionally, as a result of ring-fencing legislation, RBSI is not able to hedge with NatWest Holdings. Instead of placing hedges with NatWest Holdings Treasury, RBSI now hedges its structural exposure with bonds, primarily UK government Gilts.

Non-traded market risk continued

Interest rate risk

NTIRR can be measured from either an economic value-based or earnings-based perspective, or a combination of the two. Value-based approaches measure the change in value of the balance sheet assets and liabilities over a longer timeframe, including all cash flows. Earnings-based approaches measure the potential short-term (generally one-year) impact on the income statement of changes in interest rates.

RBS uses VaR as its value-based approach and sensitivity of net interest income (NII) as its earnings-based approach.

These two approaches provide different yet complementary views of the impact of interest rate risk on the balance sheet at a point in time. The scenarios employed in the NII sensitivity approach incorporate business assumptions and simulated modifications in customer behaviour as interest rates change. In contrast, the VaR approach assumes static underlying positions and therefore does not provide a dynamic measurement of interest rate risk. In addition, while NII sensitivity calculations are measured to a 12-month horizon and thus provide a shorter-term view of the risks on the balance sheet, the VaR approach can identify risks not captured in the sensitivity analysis, in particular the impact of duration and repricing risk on earnings beyond 12 months.

Value-at-risk

VaR is a statistical estimate of the potential change in the market value of a portfolio (and, thus, the impact on the income statement) over a specified time horizon at a given confidence level.

RBS's standard VaR metrics – which assume a time horizon of one trading day and a confidence level of 99% – are based on interest rate repricing gaps at the reporting date. Daily rate moves are modelled using observations from the last 500 business days. These incorporate customer products plus associated funding and hedging transactions as well as non-financial assets and liabilities. Behavioural assumptions are applied as appropriate.

The non-traded interest rate risk VaR metrics for RBS's retail and commercial banking activities are included in the banking book VaR table on page 153. The VaR captures the risk resulting from mismatches in the repricing dates of assets and liabilities.

It includes any mismatch between structural hedges and stable non and low interest-bearing liabilities such as equity and money transmission accounts as regards their interest rate repricing behavioural profile.

Sensitivity of net interest earnings

Net interest earnings are sensitive to changes in the level of interest rates because changes to coupons on some customer products do not always match changes in market rates of interest or central bank policy rates.

Earnings sensitivity to rate movements is derived from a central forecast over a 12-month period. A simplified scenario is shown below based on the period-end balance sheet (assuming that non-interest rate variables remain constant). Market-implied forward rates are used to generate the base case earnings forecast, which is then subject to interest rate shocks. The variance between the central forecast and the shock gives an indication of underlying sensitivity to interest rate movements.

The sensitivity of net interest earnings table shows the expected impact, over 12 months, to an immediate upward or downward change of 25 and 100 basis points to all interest rates. Yield curves are expected to move in parallel though interest rates are assumed to floor at zero per cent or, for euro rates, at the current negative rate.

The main driver of earnings sensitivity relates to interest rate pass-through assumptions on customer products. The scenario also captures the impact of the reinvestment of maturing structural hedges at higher or lower rates than the base-case earnings sensitivity and mismatches in the repricing dates of loans and deposits.

However, reported sensitivities should not be considered a guide to future performance. They do not capture potential management action in response to sudden changes in the interest rate environment. Actions that could reduce NII sensitivity and mitigate adverse impacts are changes in pricing strategies on customer loans and deposits as well as hedging. Management action may also be targeted at stabilising total income taking into account non-interest income in addition to NII.

	Parallel shifts in yield curve			
	+25 basis points	-25 basis points	+100 basis points	-100 basis points
2018	£m	£m	£m	£m
Euro	29	(3)	114	(1)
Sterling	152	(201)	651	(717)
US dollar	15	(8)	63	(42)
Other	1	2	2	3
Total	197	(210)	830	(757)
2017				
Euro	13	(8)	53	(11)
Sterling	151	(218)	664	(504)
US dollar	14	(13)	58	(49)
Other	—	(4)	—	(7)
Total	178	(243)	775	(571)

Key point

- Net interest earnings sensitivity to a 100-basis-point downward shift in yield curves rose in 2018 compared to 2017. In the shock scenarios, rates fell further at 31 December 2018 than at 31 December 2017 before hitting an assumed zero per cent floor on interest rates. This was mainly due to rises in short-term cash rates since December 2017, which increased the impact of the rate shock. This effect was not seen in the 25-basis-point downward shift as most rates remain above zero per cent after the interest rate shock.

Non-traded market risk continued

The tables below show the net interest earnings sensitivity on a one-year, two-year and three-year forward-looking basis to a parallel upward or downward shift in interest rates of 25 basis points. The projection is a simplified sensitivity in which the balance sheet is assumed to be constant, with no change in customer behaviour or margin management strategy as a result of rate changes. The benefit of structural hedges increases (or decreases) as maturing hedges are reinvested over the three-year period.

	+25 basis points parallel upward shift			-25 basis points parallel downward shift		
2018	Year 1 £m	Year 2 (1) £m	Year 3 (1) £m	Year 1 £m	Year 2 (1) £m	Year 3 (1) £m
Structural hedges	32	98	170	(32)	(98)	(167)
Managed margin (2)	150	171	170	(177)	(189)	(163)
Other	15	—	—	(2)	—	—
Total	197	269	340	(210)	(287)	(330)
2017						
Structural hedges	33	100	171	(33)	(99)	(171)
Managed margin (2)	153	170	178	(220)	(137)	(121)
Other	(8)	—	—	10	—	—
Total	178	270	349	(243)	(236)	(292)

Notes:

(1) The projections for Year 2 and Year 3 consider only the main drivers of earnings sensitivity, namely structural hedging and margin management.

(2) Primarily current accounts and savings accounts.

Sensitivity of fair value through other comprehensive income (FVOCI) and cash flow hedging reserves to interest rate movements.

RBS holds most of the bonds in its liquidity portfolio at fair value. Valuation changes that are not hedged (or not in effective hedge accounting relationships) are recognised in FVOCI reserves. This is a component of credit spread risk.

Interest rate swaps are used to implement the structural hedging programme and also hedging of some personal and commercial lending portfolios, primarily fixed rate mortgages. Generally these swaps are booked in hedge accounting relationships. Changes in the valuation of swaps that are in effective cash flow hedge accounting relationships are recognised in cash flow hedge reserves.

The table below shows the sensitivity of FVOCI reserves and cash flow hedge reserves to a parallel shift in all rates. In this analysis, interest rates have not been floored at zero. Hedges are assumed to be fully effective. Hedge ineffectiveness would be expected to result in a portion of the reserve gains or losses shown below being recognised in P&L instead of reserves. Hedge ineffectiveness P&L is monitored and the effectiveness of cash flow and fair value hedge relationships are regularly tested in accordance with IFRS requirements. Note that a movement in the FVOCI reserve would have an impact on CET1 capital but a movement in the cash flow hedge reserve would not be expected to do so. Volatility in both reserves affects tangible net asset value.

2018	+25 basis points £m	-25 basis points £m	+100 basis points £m	-100 basis points £m
FVOCI reserves	(55)	55	(220)	216
Cash flow hedge reserves	(318)	323	(1,250)	1,315
Total	(373)	378	(1,470)	1,531
2017				
FVOCI reserves	(41)	42	(164)	167
Cash flow hedge reserves	(443)	448	(1,744)	1,819
Total	(484)	490	(1,908)	1,986

Key points

- The sensitivity of the cash flow hedge reserve to interest rate movements fell in 2018. In part this reflected an increase in customer demand for longer fixed rates on mortgage products. Customers increasingly opted to fix mortgage rates for five years. This reduced the requirement for five-year interest rate swaps.
- The increase in FVOCI reserve sensitivity was driven by the increase in the bonds held in liquidity portfolios due to the establishment of the NatWest Markets Plc liquid asset buffer as a result of ring-fencing implementation.

Non-traded market risk continued

Foreign exchange risk (audited)

The table below shows structural foreign currency exposures.

2018	Net investments in foreign operations £m	Non-controlling interests (NCI) (1) £m	Net investments in foreign operations excluding NCI £m	Net investment hedges £m	Structural foreign currency exposures pre-economic hedges £m	Economic hedges (2) £m	Residual structural foreign currency exposures £m
US dollar	553	—	553	(4)	549	(549)	—
Euro	6,428	33	6,395	(853)	5,542	—	5,542
Other non-sterling	2,600	710	1,890	(1,249)	641	(81)	560
Total	9,581	743	8,838	(2,106)	6,732	(630)	6,102
2017							
US dollar	766	—	766	(14)	752	(752)	—
Euro	7,160	61	7,099	(342)	6,757	(2,224)	4,533
Other non-sterling	2,493	645	1,848	(930)	918	(453)	465
Total	10,419	706	9,713	(1,286)	8,427	(3,429)	4,998

Notes:
(1) Non-controlling interests (NCI) represents the structural foreign exchange exposure not attributable to owners' equity.
(2) Economic hedges of US dollar net investments in foreign operations represent US dollar equity securities that do not qualify as net investment hedges for accounting purposes. They provide an offset to structural foreign exchange exposures to the extent that there are net assets in overseas operations available. Economic hedges of other currency net investments in foreign operations represent monetary liabilities that are not booked as net investment hedges.

Key points

- The main driver of the reduction in structural foreign currency exposures was lower net investment in eurozone subsidiaries as a result of the €1.5 billion dividend paid by UBI DAC to NatWest Holdings Limited during Q1 2018. The reduction in US dollar exposures reflected the impact of the agreement with the US Department of Justice in relation to RMBS conduct fines.
- Euro economic hedges reduced as a result of the redemption of equity securities.
- Changes in exchange rates affect equity in proportion to structural foreign currency exposures. At 31 December 2018, a 5% strengthening in all foreign currencies against sterling results in a £0.4 billion increase in equity reserves, while a 5% weakening in all foreign currencies against sterling results in a £0.3 billion reduction in equity reserves.

Equity risk (audited)

Equity positions are carried at fair value on the balance sheet based on available market prices where possible. If market prices are not available, fair value is based on appropriate valuation techniques or management estimates.

The table below shows the balance sheet carrying value of non-traded book equity positions.

	2018 £m	2017 £m
Exchange-traded equity	41	41
Private equity	303	243
Other	87	136
	431	420

The exposures may take the form of (i) equity shares listed on a recognised exchange, (ii) private equity shares defined as unlisted equity shares with no observable market parameters or (iii) other unlisted equity shares.

	2018 £m	2017 £m
Net realised gains arising from disposals	23	82
Unrealised gains included in Tier 1 or Tier 2 capital	153	60

Note:
(1) Includes gains or losses on FVOCI instruments only.

Traded market risk

Definition

Traded market risk is the risk arising from changes in fair value on positions, assets, liabilities or commitments in trading portfolios as a result of fluctuations in market prices.

The following disclosures in this section are audited:
- Traded VaR (1-day 99%)

Sources of risk

Traded market risk mainly arises from RBS's trading activities. These activities provide a range of financing, risk management and investment services to clients − including corporations and financial institutions − around the world. From a market risk perspective, activities are focused on rates; currencies; securitised products; and traded credit. RBS undertakes transactions in financial instruments including debt securities, as well as securities financing and derivatives.

All material traded market risk resides in NatWest Markets. The key categories are interest rate risk, credit spread risk and foreign currency price risk.

Trading activities may also give rise to counterparty credit risk. For further detail refer to the Credit risk section on page 111.

Key developments in 2018

- Geopolitical risk resulted in periods of market volatility during the year. This mainly related to threats of a trade war between China and the US, elections in Italy and negotiations on a Brexit deal. European interest rates remained at low levels, although the Bank of England and US Federal Reserve continued raising rates.
- Traded VaR fluctuated throughout 2018, reflecting political developments and geopolitical risk, but remained broadly unchanged on an average basis compared to 2017.

Risk governance

Responsibility for identifying, measuring, monitoring and controlling market risk arising from trading activities lies with the relevant trading business. Oversight is provided by the Market Risk function. Traded market risk positions are reported monthly to the Executive Risk Committee and quarterly to the Board Risk Committee. Market risk policy statements set out the governance and risk management framework.

Risk appetite

RBS's qualitative appetite for traded market risk is set out in the traded market risk appetite statement. Quantitative appetite is expressed in terms of exposure limits. The limit framework at RBS level comprises value-at-risk (VaR) and stressed value-at-risk (SVaR). More details on these are provided on the following pages.

The limit framework at trading unit level also comprises additional metrics specific to the market risk exposures within its scope. These additional metrics aim to control various risk dimensions such as product type, exposure size, aged inventory, currency and tenor. For each trading business, a document known as a dealing authority compiles details of all applicable limits and trading restrictions.

The limits are reviewed to reflect changes in risk appetite, business plans, portfolio composition and the market and economic environments. To ensure approved limits are not breached and that RBS remains within its risk appetite, triggers at RBS and lower levels have been set such that if exposures exceed a specified level, action plans are developed by the relevant business and the Market Risk function and implemented.

For more detail on risk appetite, refer to page 92.

Risk controls

For information on risk controls, refer to page 92.

Risk monitoring and mitigation

Traded market risk is identified and assessed by gathering, analysing, monitoring and reporting market risk information at desk, business, franchise and RBS-wide levels. Industry expertise, continued system developments and techniques such as stress testing are also used to enhance the effectiveness of the identification and assessment of all material market risks.

Traded market risk exposures are monitored against limits and analysed daily by market risk reporting and control functions. A daily report summarising the position of exposures against limits at RBS, franchise, business and desk levels is provided to senior management and market risk managers across the function. Limit reporting is supplemented with regulatory capital and stress testing information as well as ad hoc reporting.

A risk review of trading businesses is undertaken weekly with senior risk and front office staff. This includes a review of profit and loss drivers, notable position concentrations and other positions of concern.

Business profit and loss performance is monitored automatically through loss triggers which, if breached, require a remedial action plan to be agreed between the Market Risk function and the business. The loss triggers are set using both a fall-from-peak approach and an absolute loss level. In addition, regular updates on traded market risk positions are provided to the Executive Risk Committee and Board Risk Committee.

Risk measurement (audited)

RBS uses VaR, SVaR and the incremental risk charge to measure traded market risk. Risks that are not adequately captured by VaR or SVaR are captured by the Risks Not In VaR (RNIV) framework to ensure that RBS is adequately capitalised for market risk. In addition, stress testing is used to identify any vulnerabilities and potential losses in excess of VaR and SVaR.

The key inputs into these measurement methods are market data and risk factor sensitivities. Sensitivities refer to the changes in trade or portfolio value that result from small changes in market parameters that are subject to the market risk limit framework. Revaluation ladders are used in place of sensitivities to capture the impact of large moves in risk factors or the joint impact of two risk factors.

These methods have been designed to capture correlation effects and allow RBS to form an aggregated view of its traded market risk across risk types, markets and business lines while also taking into account the characteristics of each risk type.

Value-at-risk

For internal risk management purposes, VaR assumes a time horizon of one trading day and a confidence level of 99%.

The internal VaR model – which captures all trading book positions including those products approved by the regulator – is based on a historical simulation, utilising market data from the previous 500 days on an equally-weighted basis.

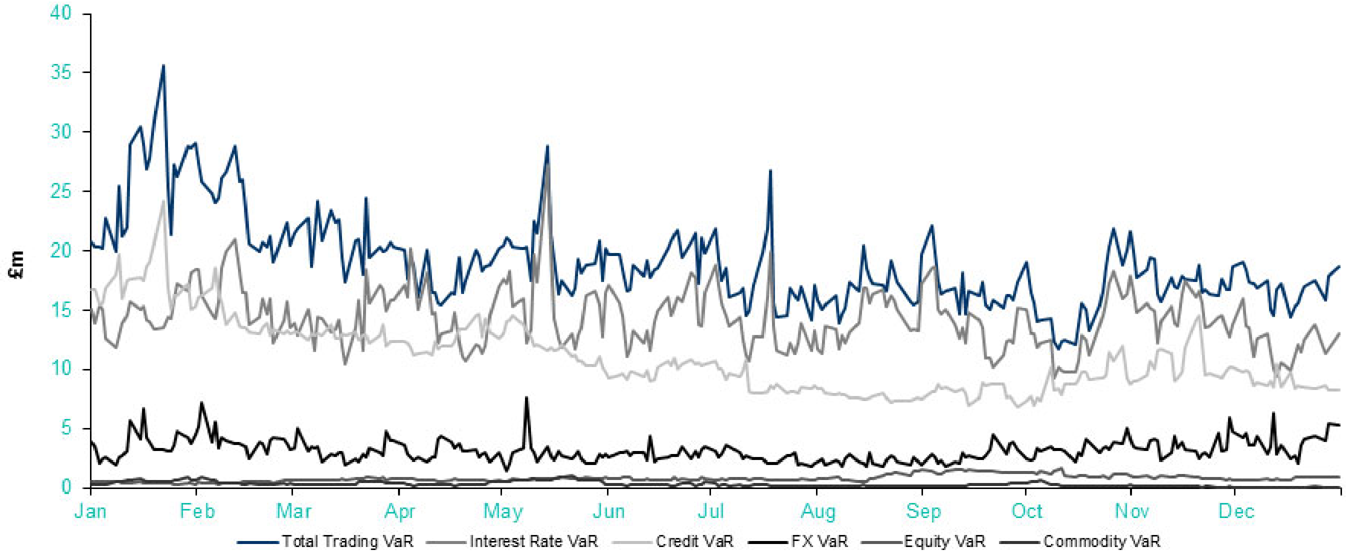
The model also captures the potential impact of interest rate risk; credit spread risk; foreign currency price risk; equity price risk; and commodity price risk.

When simulating potential movements in such risk factors, a combination of absolute, relative and rescaled returns is used.

Testing of the performance and adequacy of the VaR model is done on a regular basis through the following processes:
- Back-testing – Internal and regulatory back-testing is conducted on a daily basis. (For information on internal back-testing, refer to page 159.)
- Ongoing model validation – VaR model performance is assessed both regularly and on an ad-hoc basis if market conditions or portfolio profile change significantly.
- Model Risk Management review – As part of the model lifecycle, all risk models (including the VaR model) are independently reviewed to ensure the model is still fit for purpose given current market conditions and portfolio profile.

Traded market risk continued

One-day 99% traded internal VaR



Traded VaR (1-day 99%)

The table below shows one-day 99% internal VaR for RBS's trading portfolios, split by exposure type.

	2018				2017			
	Average £m	Maximum £m	Minimum £m	Period end £m	Average £m	Maximum £m	Minimum £m	Period end £m
Interest rate	14.3	27.3	9.2	13.0	14.1	24.5	8.8	15.3
Credit spread	11.0	24.2	6.9	8.2	12.1	19.4	8.8	16.7
Currency	3.1	7.6	1.4	5.3	4.9	10.0	2.3	3.5
Equity	0.8	1.6	0.3	0.8	1.2	2.1	0.4	0.4
Commodity	0.3	1.0	0.1	0.1	0.4	1.3	—	0.2
Diversification (1)	(10.5)			(8.8)	(12.8)			(15.3)
Total	19.0	35.6	11.7	18.6	19.9	29.5	13.2	20.8

Note:
(1) RBS benefits from diversification since it reduces risk by allocating positions across various financial instrument types, currencies and markets. The extent of the diversification benefit depends on the correlation between the assets and risk factors in the portfolio at a particular time. The diversification factor is the sum of the VaR on individual risk types less the total portfolio VaR.

Key points

- Although traded VaR fluctuated throughout 2018 as explained earlier, it remained broadly unchanged year-on-year on both an average and period-end basis.
- The peaks in January, May and July were largely related to bond syndication activity and, in the case of January, long euro rates.

Traded market risk continued

VaR back-testing

The main approach employed to assess the VaR model's ongoing performance is back-testing, which counts the number of days when a loss exceeds the corresponding daily VaR estimate, measured at a 99% confidence level.

Two types of profit and loss (P&L) are used in back-testing comparisons: Actual P&L and Hypothetical (Hypo) P&L.

The Actual P&L for a particular business day is the firm's actual P&L in respect of trading activities, including intraday activities, adjusted by stripping out fees and commissions, brokerage, and additions to and releases from reserves not directly related to market risk.

The Hypo P&L reflects the firm's Actual P&L excluding any intra-day activities.

A portfolio is said to produce a back-testing exception when the Actual or Hypo P&L exceeds the VaR level on a given day. Such an event may be caused by a large market movement or may highlight issues such as missing risk factors or inappropriate time series. Any such issues identified are analysed and addressed through appropriate remediation or development action. Both Actual and Hypo back-testing exceptions are monitored.

The table below shows internal back-testing exceptions for the 250-business-day period to 31 December 2018 for one-day 99% traded internal VaR compared with Actual and Hypo P&L for the major NatWest Markets businesses.

	Back-testing exceptions	
	Actual	Hypo
Rates	4	8
Currencies	—	4
Credit	—	—

Key points

- Statistically RBS would expect to see back-testing exceptions 1% of the time over the 250-day period.
- The exceptions in the Rates business were mainly driven by the increased volatility connected with large market movements due to political uncertainty in Italy and Spain.
- The exceptions in the Currencies business were mainly due to market movements.

Stressed VaR (SVaR)

As with VaR, the SVaR methodology produces estimates of the potential change in the market value of a portfolio, over a specified time horizon, at a given confidence level. SVaR is a VaR-based measure using historical data from a one-year period of stressed market conditions.

A simulation of 99% VaR is run on the current portfolio for each 250-day period from 2005 to the current VaR date, moving forward one day at a time. The SVaR is the worst VaR outcome of the simulated results.

This is in contrast with VaR, which is based on a rolling 500-day historical data set. A time horizon of ten trading days is assumed with a confidence level of 99%.

The internal traded SVaR model captures all trading book positions.

	Period-end 2018 £m	Period-end 2017 £m
10-day 99% traded internal SVaR	161	172

Key point

- Traded SVaR remained broadly unchanged.

Risks not in VaR (RNIVs)

The RNIV framework is used to identify and quantify market risks that are not fully captured by the internal VaR and SVaR models.

RNIV calculations form an integral part of ongoing model and data improvement efforts to capture all market risks in scope for model approval in VaR and SVaR.

For quantitative disclosures on RNIVs, refer to the Market Risk section of the Pillar 3 Report.

Stress testing

For information on stress testing, refer to page 93.

Incremental risk charge (IRC)

The IRC model quantifies the impact of rating migration and default events on the market value of instruments with embedded credit risk (in particular, bonds and credit default swaps) held in the trading book. It further captures basis risk between different instruments, maturities and reference entities.

Model validation

RBS uses a variety of models to manage and measure market risk. These include pricing models (used for valuation of positions) and risk models (for risk measurement and capital calculation purposes). They are developed and approved in NatWest Markets, with material models subject to independent review by Model Risk Management. For further detail on the independent model validation carried out by Model Risk Management refer to page 93. Information relating to pricing and market risk models is presented below.

Pricing models

Pricing models are developed by a dedicated first line team, in conjunction with the trading desk. The models are used to value positions for which prices are not directly observable as well as for the risk management of the portfolio. Any pricing models that are used as the basis for valuing portfolios and records are subject to approval and oversight by asset-level modelled product review committees. These committees comprise representatives of the trading, finance, market risk, model development and model review functions. Approval requires review and approval by these stakeholders as well as Model Risk Management.

The review process includes the following steps:

- The committees prioritise models for review by Model Risk Management, considering the materiality of the risk booked against the model and an assessment of the degree of model risk, which is the valuation uncertainty arising from the choice of modelling assumptions.
- Model Risk Management quantifies the model risk, which may include comparing the model outputs with those of alternative models developed by Model Risk Management.
- The sensitivities derived from the pricing models are validated.
- The conclusions of the review are used to inform risk limits and by the Finance function to inform model reserves.

Risk models

All model changes are approved through model governance committees at franchise level. Changes to existing models are subject to Model Risk Management review. RBS follows regulatory guidance for assessing the materiality of extensions and changes to the internal model approach for market risk. In addition to Model Risk Management's independent oversight – which provides additional assurance that RBS holds appropriate capital for the market risk to which it is exposed – the model testing team monitors the model performance for market risk through back-testing and other processes.

Pension risk

Definition

Pension obligation risk is the risk to RBS caused by its contractual or other liabilities to, or with respect to, a pension scheme (whether established for its employees or those of a related company or otherwise). It is also the risk that RBS will make payments or other contributions to, or with respect to, a pension scheme because of a moral obligation or because RBS considers that it needs to do so for some other reason.

Sources of risk

RBS has exposure to pension risk through its defined benefit schemes worldwide. The Main section of The Royal Bank of Scotland Group Pension Fund (the Main section) is the largest source of pension risk with £43.8 billion of assets and £35.5 of liabilities at 31 December 2018 (2017 – £44.7 billion assets and £37.9 billion liabilities). Further detail on RBS's pension obligations, including sensitivities to the main risk factors, can be found in Note 5 on the consolidated accounts.

Pension scheme liabilities vary with changes in long-term interest rates and inflation as well as with pensionable salaries, the longevity of scheme members and legislation. Pension scheme assets vary with changes in interest rates, inflation expectations, credit spreads, exchange rates, and equity and property prices. RBS is exposed to the risk that the schemes' assets, together with future returns and additional future contributions, are insufficient to meet liabilities as they fall due. In such circumstances, RBS could be obliged (or might choose) to make additional contributions to the schemes, or be required to hold additional capital to mitigate this risk.

Key developments in 2018

- A Memorandum of Understanding between RBS and the Trustee of the Main section was reached in April 2018, which enabled RBS to bring the pension scheme into alignment with ring-fencing rules and reduce exposure to pension risk.
- RBS made a £2 billion contribution to the Main section in H2 2018 and it was agreed this could be followed by up to a further £1.5 billion of dividend linked contributions to be paid from 2020, capped at £500 million per year.
- The contribution to the scheme facilitated a reduction in the risk profile of the fund, principally the sale of approximately £6 billion of quoted equity exposure and the purchase of further interest rate and inflation hedging.

Risk governance

The Pension Committee is chaired by the RBS Chief Financial Officer. It receives its authority from the Group Executive Committee and formulates RBS's view of pension risk. The Pension Committee is a key component of RBS's approach to managing pension risk and it reviews and monitors risk management, asset strategy and financing issues on behalf of RBS. It also considers investment strategy proposals from the Trustee.

For further information on Risk governance, refer to page 91.

Risk appetite

RBS maintains an independent view of the risk inherent in its pension funds. RBS has an annually reviewed pension risk appetite statement incorporating defined metrics against which risk is measured. RBS undertakes regular pension risk monitoring and reporting to the Board, the Board Risk Committee and the Pension Committee on the material pension schemes that RBS has an obligation to support.

Risk controls

A pension risk management framework is in place to provide formal controls for pension risk reporting, modelling, governance and stress testing. A pension risk policy, which sits within the RBS policy framework, is also in place and is subject to associated framework controls.

Risk monitoring and measurement

Pension risk reports are submitted to the Executive Risk Committee and the Board Risk Committee four times a year in the Risk Management Quarterly Report.

RBS also undertakes stress tests and scenario analyses on its material defined benefit pension schemes each year. These tests are also used to satisfy the requests of regulatory bodies such as the Bank of England. The stress testing framework includes pension risk capital calculations for the purposes of the Internal Capital Adequacy Assessment Process as well as additional stress tests for a number of internal management purposes.

The results of the stress tests and their consequential impact on RBS's balance sheet, income statement and capital position are incorporated into the overall RBS stress test results.

Risk mitigation

The trustee has taken measures to mitigate inflation and interest rate risks, both by investing in suitable financial assets and by entering into inflation and interest rate swaps. The Main section also uses derivatives to manage the allocation of the portfolio to different asset classes and to manage risk within asset classes. The contribution made to the Main section also facilitated a £6 billion reduction in quoted equity exposure and an increase in interest rates and inflation hedging in 2018.

Compliance & conduct risk

Definition

Compliance risk is the risk that the behaviour of RBS towards customers fails to comply with laws, regulations, rules, standards and codes of conduct. Such a failure may lead to breaches of regulatory requirements, organisational standards or customer expectations and could result in legal or regulatory sanctions, material financial loss or reputational damage.

Conduct risk is the risk that the conduct of RBS and its subsidiaries and its staff towards customers – or in the markets in which it operates – leads to unfair or inappropriate customer outcomes and results in reputational damage, financial loss or both.

Sources of risk

Compliance and conduct risks exist across all stages of RBS's relationships with its customers and arise from a variety of activities including product design, marketing and sales, complaint handling, staff training, and handling of confidential insider information. As set out in Note 27 on the consolidated accounts, RBS and certain members of staff are party to legal proceedings and are subject to investigation and other regulatory action in the UK, the US and other jurisdictions.

Key developments in 2018

- An enhanced compliance and conduct risk framework was developed, setting minimum standards for the management and measurement of compliance and conduct risks across RBS.
- Enhanced product monitoring and reporting was introduced.
- Controls, systems and processes were revised to ensure compliance with the UK's ring-fencing rules.
- PPI remediation continued in advance of the FCA's August 2019 deadline for claims (refer to Note 20 on the consolidated accounts).
- Work to address legacy GRG complaints continued. The process closed to new complaints in the UK on 22 October 2018.
- Product and pricing continued to be simplified for new and existing customers.

Risk governance

RBS defines appropriate standards of compliance and conduct and ensures adherence to those standards through its risk management framework.

Compliance & conduct risk continued

Risk appetite
Risk appetite for compliance and conduct risks is set at Board level. RBS Risk appetite statements articulate the levels of risk that legal entities, franchises and functions work within when pursuing their strategic objectives and business plans.

Risk controls
RBS operates a range of controls to ensure its business is conducted in accordance with legal and regulatory requirements, as well as delivering good customer outcomes. A suite of policies addressing compliance and conduct risks set appropriate standards across RBS. Examples of these include the Complaints Management Policy, Client Assets & Money Policy, and Product Lifecycle Policy as well as policies relating to customers in vulnerable situations, cross-border activities and market abuse. Continuous monitoring and targeted assurance is undertaken, as appropriate.

Risk monitoring and measurement
Compliance and conduct risks are measured and managed through continuous assessment and reporting to RBS's senior risk committees and at Board level.

The compliance and conduct risk framework facilitates the consistent monitoring and measurement of compliance with laws and regulations and the delivery of consistently good customer outcomes.

The first line of defence is responsible for effective risk identification, reporting and monitoring, with oversight, challenge and review by the second line. Compliance and conduct risk management is also integrated into RBS's strategic planning cycle.

Risk mitigation
Activity to mitigate the most-material compliance and conduct risks is carried out across RBS with specific areas of focus in the customer-facing franchises and legal entities. Examples of mitigation include consideration of customer needs in business and product planning, targeted training, complaints management, as well as independent assurance activity. Internal policies help support a strong customer focus across RBS. Independent assessments of compliance with applicable regulations are also carried out at a legal entity level.

Financial crime

Definition
Financial crime risk is the risk presented by criminal activity in the form of money laundering, terrorist financing, bribery and corruption, sanctions and tax evasion. It does not include fraud risk management.

Sources of risk
Financial crime risk may be presented if RBS's employees, customers or third parties undertake or facilitate financial crime, or if RBS's products or services are used to facilitate such crime. Financial crime risk is an inherent risk across all of RBS's lines of business.

Key developments in 2018
- In March 2018, the Federal Reserve Board terminated a Cease & Desist Order originally imposed in July 2011 for financial crime compliance weaknesses identified across RBS's US businesses and concerns about the level of oversight that the RBS Board of Directors had over large and complex US operations. The termination of the Order followed a multi-year programme of work to establish an enhanced governance and oversight framework, risk management programme and compliance programme.
- In October 2018, the Federal Reserve Board terminated a Cease & Desist Order originally imposed in December 2013. The Order, which related to RBS Group and RBS plc's historical compliance with Office of Foreign Assets Control (OFAC) economic sanctions regulations, was terminated following a multi-year programme of work to establish a robust, sustainable OFAC Sanctions compliance framework.
- While the financial crime governance framework was strengthened during 2018 – along with the introduction of enhanced control effectiveness assurance processes, enhancements to existing risk assessment models, the introduction of a new Anti-Tax Evasion risk assessment; and improved monitoring controls and enhanced investigation processes – the journey of improvement continues.

Risk governance
Financial crime risk is principally governed through the Financial Crime Risk Executive Committee, which is chaired by the Chief Financial Crime Officer. The committee reviews and, where appropriate, escalates material risks and issues to the Group Executive Risk Committee and the Group Board Risk Committee.

Risk appetite
RBS has no appetite to operate in an environment where systems and controls do not enable RBS to identify, assess, monitor, manage and mitigate financial crime risk. RBS's systems and controls must be comprehensive and proportionate to the nature, scale and complexity of its businesses. RBS has no tolerance to systematically or repeatedly breach relevant financial crime regulations and laws.

Risk controls
RBS operates a framework of preventative and detective controls designed to ensure RBS mitigates the risk that it could facilitate financial crime. These controls are supported by a suite of policies, procedures and detailed instructions to ensure they operate effectively.

Risk monitoring and measurement
Financial crime risks are identified and reported through continuous risk management and regular monthly reporting to RBS's senior risk committees and the Board. Quantitative and qualitative data is reviewed and assessed to measure whether financial crime risk is within the Group's risk appetite.

Risk mitigation
Through the financial crime framework, RBS employs relevant policies, systems, processes and controls to mitigate financial crime risk. This would include the use of dedicated screening and monitoring controls to identify people, organisations, transactions and behaviours which might require further investigation or other actions. RBS ensures that centralised expertise is available to detect and disrupt threats to the Group and its customers. Intelligence is shared with law enforcement, regulators and government bodies to strengthen national and international defences against those who would misuse the financial system for criminal motives.

Operational risk

Definition
Operational risk is the risk of loss resulting from inadequate or failed internal processes, people and systems, or external events. It arises from day-to-day operations and is relevant to every aspect of the business.

Sources of risk
Operational risk may arise from a failure to manage operations, systems, transactions and assets appropriately. This can take the form of human error, an inability to deliver change adequately or on time, the non-availability of technology services, or the loss of customer data. Fraud and theft – as well as the increasing threat of cyber attacks – are sources of operational risk, as is the impact of natural and man-made disasters. Operational risk can also arise from a failure to account for changes in law or regulations or to take appropriate measures to protect assets.

Operational risk continued

Key developments in 2018

- Risk provided oversight of several bank-wide programmes including the Transformation portfolio, structural reform, European Commission (EC) State Aid obligations and Brexit preparations.
- Key corporate structural reform milestones were delivered, including the implementation of the Financial Services Markets Act Part VII and migration activities to separate the ring-fence bank from the non ring-fenced bank.
- RBS is well positioned to deliver the activities required to support the Business Banking Switch Scheme that is due to commence in 2019, as part of the Group's final EC State Aid obligation.
- RBS has established an Innovation Risk Oversight team to provide bank-wide oversight of its innovation portfolio to help deliver safely and at pace.
- RBS continued to review its well established incident management and coordination procedures to manage the persistent and evolving nature of information and cyber security risks.
- Internal security improvement programmes and controls were developed and strengthened to protect RBS and its customers. RBS uses proactive threat management and intelligence processes to identify, manage and mitigate credible threats.
- RBS continued to reduce and simplify its technology estate through strategic investment and Technology transformation initiatives to limit opportunities for hackers and fraudsters. Improvements in capability were also made to the Security Operations Centre, strengthening controls to prevent data leakage, enhance malware defences and management of user access to key systems.
- The number of critical customer impacting incidents that RBS experiences continues to reduce year-on-year. There were 17 such incidents in 2018 compared to 20 in 2017.
- Internal training programmes ensure all employees are aware of the threats facing RBS and remain vigilant to unauthorised attempts to access systems and data.

Risk governance

A strong operational risk management function is vital to support RBS's ambitions to serve its customers better. Improved management of operational risk against defined appetite directly supports the strategic risk objective of improving stakeholder confidence and is vital for stability and reputational integrity.

The Operational Risk function, which is the second line of defence, delivers a robust operational risk management framework and culture across RBS.

The Operational Risk function is responsible for the execution and continuous improvement of the operational risk management framework.

The Operational Risk Executive Committee (OREC) is responsible for reviewing operational risk exposure; identifying and assessing both current and emerging material operational risks; reviewing and monitoring the operational risk profile; and reviewing and approving material operational risk policy changes.

Risk appetite

Operational risk appetite supports effective management of material operational risks. It expresses the level and types of operational risk RBS is willing to accept to achieve its strategic objectives and business plans.

The Group-wide operational risk appetite statement encompasses the full range of operational risks faced by its legal entities, franchises and functions. A subset of the most material risk appetite measures are defined as board risk measures, which are those that, should the limit be breached, would impact on the ability to achieve business plans and threaten stakeholder confidence.

Risk controls

The Control Environment Certification (CEC) process is a half yearly self-assessment by the CEOs of RBS's franchises and business units, as well as the heads of the support and control functions, providing a view on the adequacy and effectiveness of the internal control environment in a consistent and comparable manner. In line with ring-fencing requirements, from H2 2018 certificates were also produced for the following legal entities: NatWest Holdings Limited; NatWest Markets Plc; The Royal Bank of Scotland International Limited; Ulster Bank Ireland DAC; and Coutts and Co.

CEC covers material risks and the underlying key controls, including financial, operational and compliance controls, as well as supporting risk management frameworks. The CEC outcomes, including forward-looking assessments for the next two half-yearly cycles and progress on control environment improvements, are reported to the Board, Group Audit Committee and Board Risk Committee. They are also shared with external auditors.

The CEC process helps to ensure compliance with the RBS Policy Framework, Sarbanes-Oxley 404 requirements concerning internal control over financial reporting (as referenced in the Compliance report on page 84), and certain requirements of the UK Corporate Governance Code.

Risk monitoring and measurement

Risk and control assessments are used across all business areas and support functions to identify and assess material operational and conduct risks and key controls. All risks and controls are mapped to RBS's Risk Directory. Risk assessments are refreshed at least annually to ensure they remain relevant and capture any emerging risks, with associated trigger processes to ensure risks are reassessed at key periods of change.

The process is designed to confirm that risks are effectively managed and prioritised in line with risk appetite. Controls are tested at the appropriate frequency to verify that they remain fit-for-purpose and operate effectively.

RBS uses the standardised approach to calculate its Pillar 1 operational risk capital requirement. This is based on multiplying three years' average historical gross income by coefficients set by the regulator based on business line. As part of the wider Internal Capital Adequacy Assessment Process an operational risk economic capital model is used to assess Pillar 2A, which is a risk-sensitive add-on to Pillar 1.The model uses historical loss data (internal and external) and forward-looking scenario analysis that is provided by Operational Risk to provide a risk-sensitive view of RBS's P2A capital requirement.

Scenario analysis is used to assess how extreme but plausible operational risks will affect RBS. It provides a forward-looking basis for evaluating and managing operational risk exposures.

Refer to the Capital, liquidity and funding risk section for operational risk capital requirement figures.

Event and loss data management

The operational risk event and loss data management process ensures RBS captures and records operational risk financial and non financial events that meet defined criteria. Loss data is used for regulatory and industry reporting and is included in capital modelling when calculating economic capital for operational risk. The most serious events are escalated in a simple, standardised process to all senior management, by way of a Group Notifiable Event Process.

Operational risk continued

All financial impacts associated with an operational risk event are reported against the date they were recorded in RBS's financial accounts. A single event can result in multiple losses (or recoveries) that may take time to crystallise. Losses and recoveries with a financial accounting date in 2018 may relate to events that occurred, or were identified in, prior years. RBS purchases insurance against specific losses and to comply with statutory or contractual requirements.

Percentage and value of events

At 31 December 2018, events aligned to the clients, products and business practices event category accounted for 98% of RBS's operational risk losses (compared to 93% in 2017). The increase reflected new or additional conduct-related provisions recorded during 2018, most notably the US Department of Justice mortgage-backed securities-related settlement.

	Value of events				Volume of events (1)	
	£m		Proportion		Proportion	
	2018	2017	2018	2017	2018	2017
Fraud	19	28	1%	2%	74%	74%
Clients, products and business practices (2)	1,552	1,264	98%	93%	15%	12%
Execution, delivery and process management	12	58	1%	4%	10%	9%
Employment practices and workplace safety	1	5	—	1%	1%	5%
	1,584	1,355	100%	100%	100%	100%

Notes:
(1) The calculation in the table above is based on the volume and value of events (the proportion and cost of operational risk events to RBS) where the associated loss is more than or equal to £10,000.
(2) 2017 losses have been restated from £732 million following finalisation of material MBS-related settlements.

Operational resilience

RBS manages and monitors operational resilience through its risk and control assessments methodology. As challenges to operational resilience become more demanding, given a hostile cyber environment and a greater focus on serving customers through digital platforms, RBS is working with supervisory authorities in the UK to ensure the provision of its products and services can be maintained regardless of the cause of disruption.

This is underpinned by setting, monitoring and testing tolerances for key business services, which define the amount of disruption that could be tolerated.

Risk mitigation

Risks are mitigated by applying key preventative and detective controls, an integral step in the risk assessment methodology which determines residual risk exposure. Control owners are accountable for the design, execution, performance and maintenance of key controls. Key controls are regularly assessed for adequacy and tested for effectiveness. The results are monitored and, where a material change in performance is identified, the associated risk is re-evaluated.

Business risk

Definition

Business risk is the risk that RBS does not have a strategy that is sufficiently well defined to provide clarity on its long-term ambitions to key internal and external stakeholders, or that it is not able to execute upon its chosen strategy as communicated to the market, regulators and other key stakeholders. The risk is that RBS does not deliver its expected business performance which could give rise to a deterioration in stakeholder trust and confidence and/or a breach of regulatory thresholds. RBS may not be able to execute its chosen strategy if there are material changes to RBS's internal or external operating environment.

Sources of risk

Business risk arises as a result of RBS's exposure to the macro-economy (including economic and political factors), the competitive environment, regulatory and technological changes. In addition, internal factors such as the ability to deliver complex change, volatility in sales volumes, input costs, and other operational risks affect RBS's ability to execute its chosen strategic business plan as intended and thus contribute to business risk.

Key developments in 2018

- As part of its requirement by UK law to separate its everyday banking services from its investment banking by 1 January 2019 – known as ring-fencing – RBS made a number of changes to the way its business was structured. Certain Personal & Business Banking businesses and Commercial Banking businesses of The Royal Bank of Scotland plc transferred to Adam & Company PLC and National Westminster Bank Plc. The role of issuer under the covered bond programme transferred to National Westminster Bank Plc. Adam & Company PLC was renamed "The Royal Bank of Scotland plc", and The Royal Bank of Scotland plc was renamed "NatWest Markets Plc". The Royal Bank of Scotland plc superseded the prior issuer (former RBS plc) in respect of banknotes.
- RBS also restructured the NatWest Markets Plc (former RBS plc) capital structure. The shares in NatWest Holdings Limited, which owns the ring-fenced sub-group, were distributed to RBS. This separated the ring-fenced sub-group from the non-ring-fenced entities, as required by ring-fencing legislation. RBS also transferred the customer interest rate and foreign exchange derivatives business of National Westminster Bank Plc to NatWest Markets Plc.
- RBS reached a civil settlement in principle with the US Department of Justice in relation its investigation into RBS's issuance and underwriting of US Residential Mortgage Backed Securities (RMBS) between 2005 and 2007, resulting in a £1.0 billion additional provision.
- UK Government Investments Limited announced the successful completion of the disposal of part of HM Treasury's shareholding in The Royal Bank of Scotland Group plc, representing approximately 7.7% of the ordinary share capital of the Group. HM Treasury's shareholding in RBS now represents 62.3% of the Group's ordinary share capital.
- On 17 April 2018 RBS agreed a Memorandum of Understanding (MoU) with the Trustees of the RBS Group Pension Fund in connection with the requirements of ring-fencing. NatWest Markets Plc cannot continue to be a participant in the Main section and separate arrangements are required for its employees. Under the MoU NatWest Bank made a contribution of £2 billion on 9 October 2018 to strengthen funding of the Main section in recognition of the changes in covenant.

Capital and risk management

Business risk continued

- RBS declared an interim ordinary dividend of 2 pence per share – the first since September 2008.

Risk governance
The Board has ultimate responsibility for business risk and for approving strategic plans, initiatives and changes to strategic direction.

RBS's strategic planning process is managed by Strategy and Corporate Development. The Risk and Finance functions are key contributors to strategic planning.

Responsibility for the day-to-day management of business risk lies primarily with the franchises, with oversight by the Finance function. The franchises are responsible for delivery of their business plans and the management of such factors as pricing, sales volumes, marketing expenditure and other factors that can introduce volatility into earnings.

Risk appetite
Risk Appetite defines the level and types of risk it is willing to accept in order to achieve its strategic objectives and business plans. RBS articulates its appetite for business risk through the implementation of qualitative risk appetite statements and quantitative risk measures at franchise and function level. These statements and measures help determine the level and types of business risk RBS is willing to accept.

Risk controls
For information on risk controls, refer to page 92.

Risk monitoring and measurement
Business risk is identified and managed at the product and transaction level. Estimated revenue, costs and capital are key considerations in the design of any new product or in any new investment decision. Business risk is reported, assessed and challenged at every governance level within the organisation. Each franchise monitors its financial performance relative to plans and reports this on a regular basis to the finance directors of each franchise.

Risk mitigation
RBS operates a monthly rolling forecasting process to identify projected changes in, or risks to, key financial metrics, and ensures appropriate actions are taken.

Reputational risk
Definition
Reputational risk is the risk to RBS's public image from a failure to meet stakeholders' expectations in relation to performance, conduct or business profile. Stakeholders include customers, investors, employees, suppliers, government, regulators, special interest and consumer groups, media and the general public.

Sources of risk
Reputational risk can arise from the conduct of employees; customer activities and the sectors and countries in which they operate; provision of products and transactions; as well as operations and infrastructure.

Key developments in 2018
- Metrics were reviewed and enhanced to help measure reputational risk across the Group.
- Risk appetite positions for countries and sectors identified as presenting heightened reputational risk continued to be reviewed and strengthened.

Risk governance
A reputational risk policy supports reputational risk management across RBS. Reputational risk committees in PBB, CPB, RBSI, Ulster Bank RoI and NatWest Markets review relevant issues at an individual franchise or entity level, while the Group Reputational Risk Committee – which has delegated authority from the Executive Risk Committee – opines on cases, issues, sectors and themes that represent a material reputational risk to the Group. The Board Risk Committee oversees the identification and reporting of reputational risk. The Sustainable Banking Committee has a specific focus on environmental, social and ethical issues.

Risk appetite
RBS manages and articulates its appetite for reputational risk through a qualitative reputational risk appetite statement and quantitative measures. RBS seeks a continued improvement in the identification, assessment and management of customers, transactions, products and issues that present a material reputational risk.

Risk controls
For information on risk controls, refer to page 92.

Risk monitoring and measurement
Primary reputational risk measures are in place to assess internal activity relating to the management of reputational risk, including training. A number of secondary risk measures – including measures also used in the management of operational, conduct and financial risks – are used to assess relevant external factors. Quarterly reports on performance against these measures are provided to the Executive Risk Committee and Board Risk Committee.

Risk mitigation
Reputational risk is mitigated through the policy and governance framework, with ongoing staff training to ensure early identification, assessment and escalation of material issues.

The most material threats to RBS's reputation continued to originate from historical and more recent conduct issues. As a result, RBS has been the subject of investigations and reviews by a number of regulators and governmental authorities, some of which have resulted in fines, settlements and public censure. Refer to the Litigation, investigations and reviews section of Note 27 on the consolidated accounts.