EUROPEAN CENTRAL BANK

BANKING SUPERVISION

Asset Quality Review

Phase 2 Manual

June 2018

Contents

Introduction

This manual provides the parties involved with the information necessary to execute Phase 2 of the asset quality review (AQR).

This introduction aims to explain the high-level methodology for Phase 2 of the AQR and the approach for communicating the methodology to all involved parties.

Phase 2 of the AQR begins in full following completion of the portfolio selection (Phase 1). This manual provides the detailed methodology for the exercise. Successful execution of the AQR Phase 2 requires consistent application of the centrally defined methodology. As a significant number of third-party providers may provide support in the execution of the AQR, the methodology must be clearly passed down to all practitioners involved. The Central Project Management Office (CPMO) – the author of the methodology – may provide additional technical support and clarification throughout the exercise.

Context around Phase 2 of the AQR

AQR as part of the comprehensive assessment

The European Central Bank (ECB) and the national competent authorities (NCAs) responsible for conducting banking supervision carry out comprehensive assessments (CAs) of banks, in line with the provisions of the Regulation on the single supervisory mechanism (SSM Regulation). A CA consists of an AQR and a stress test. Following completion of Phase 1 of the AQR (portfolio selection), Phase 2 – execution of the AQR – begins. This document is the "manual" to be followed in executing Phase 2 of the AQR: the "Phase 2 manual". The final results of the comprehensive assessment are determined on the basis of a "join-up" of the AQR and the stress test, in which the results of both are combined (while duly avoiding any double-counting impact).

AQR as a prudential exercise

The AQR is conducted with reference to harmonised definitions. This means that the AQR methodology complies fully with the relevant accounting principles (e.g. for IFRS banks IFRS 9, IAS 37, IFRS 13). Nevertheless, the AQR is a prudential exercise, focused on providing the necessary clarity on the situation of banks that are, or will be, subject to the ECB's direct supervision. Therefore, for the purposes of the AQR and to ensure consistency of findings across banks, further guidance is provided on particular topics around how to apply the principles in the accounting rules. The AQR should not be seen as an attempt to introduce greater prescription into the accounting rules outside of the existing mechanisms; as such

methodological choices reflected in this manual should not be interpreted as attempts to prescribe accounting practices.

Link to international vs national accounting standards

The manual has been written with a focus on IFRS principles, although some banks subject to the AQR may apply national generally accepted accounting principles (GAAP). For these banks, bank teams will be required to align as closely with the manual as is appropriate given national GAAP rules. The ECB and the relevant NCA(s) will cooperate closely in preparing the AQR to develop the specific approach.

Link to other ECB publications

The ECB/SSM occasionally publishes guidelines, policy stances, methodologies, and other similar documents on aspects covered by the AQR methodology. As those reflect official ECB/SSM views, they should be seen as complementary guidance to be taken into account in applying the methodology described in this manual. Where necessary, specific instructions on the implementation of such additional guidance will be provided to all parties involved in the AQR in the form of methodological notes/circulars.

Key outputs from Phase 2 of the AQR

There will be two primary outputs from Phase 2 of the AQR:

Key issues to include in a letter (or other form of supervisory communication) to the relevant bank: Following completion of the AQR, the Joint Supervisory Teams (JSTs) (comprising ECB and NCA supervisors) will write a letter to each bank outlining any areas where it is found to be outside of accounting principles or of supervisory requirements and the required remedial actions the bank would be expected to take (including adjustments to the carrying values of assets). In some cases, these issues would be expected to lead to adjustments to available capital and hence be reflected in Pillar 1 capital requirements at the next reporting date.

Inputs into the stress test/overall CA results: The AQR generates a series of parameters that will act as inputs into the stress test process and, ultimately, the overall CA results. The key inputs into the stress test will be: any adjustments to data segmentation highlighted by data integrity validation (DIV); an AQR-adjusted Common Equity Tier 1% (CET1%) parameter (to allow the impact of the AQR to be applied to stress test projections of CET1%); probability of default (PD) and loss given impairment (LGI)/loss given loss (LGL) parameters for use in the stress test.

Summary of Phase 2 methodology workblocks

The high-level process for Phase 2 of the AQR contains ten different workblocks, as illustrated in the figure below:

Figure 1

Illustration of Phase 2 workblocks
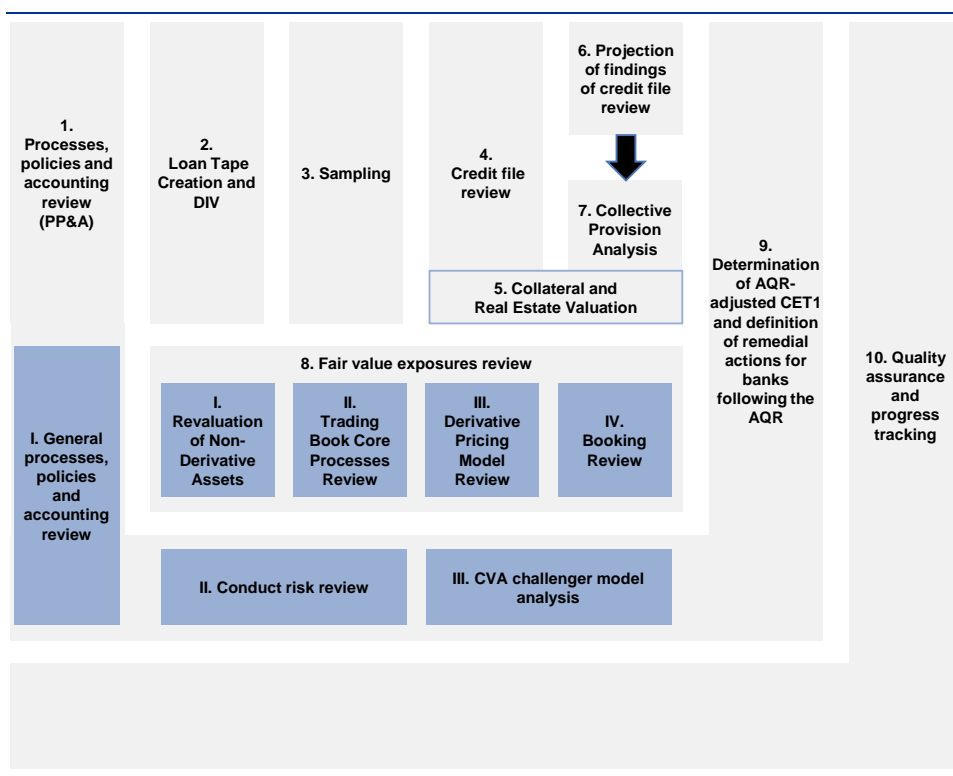
The review is led centrally by the CPMO, supported by the NCAs of the banks concerned. It is carried out at bank level by a team consisting of third-party audit firms and/or other asset appraisal specialists (depending on the capabilities of the auditor) – termed the "bank team". In cases where a JST, comprising ECB and NCA staff, has already been established for a bank subject to the AQR by the time the exercise is carried out, the JST may take on what is referred to throughout this manual as the role of the NCA. Each element of the review is summarised below and described in detail in the subsequent chapters of the manual:

1. **Processes, policies and accounting review:** Bank processes, policies and accounting practices have a key impact on the carrying values of assets in banks' balance sheets and so must be reviewed. The review represents a "bare minimum" review of the key topics that influence accounting balance sheet valuations. Key topics to be covered include: application of fair value hierarchy; accounting classifications (amortised cost, fair value through profit & loss, fair value through other comprehensive income); high-level credit valuation adjustment (CVA) approach; provisioning approach; impairment staging criteria; treatment of non-performing exposures (NPEs) and forbearance; etc. *This will*

take place between week 2 and week 9 of the AQR process. In addition to the general processes, policies and accounting review, a conduct risk review focusing on conduct-related issues as a key source of risk to capital will be carried out for banks with material business related to investment services and activities. *This will be carried out between week 2 and week 21 of the AQR process.*

2. **Loan tape creation and DIV:** The credit analysis (sample selection and collective provisioning challenger model creation) is based on a "loan tape" provided by the bank. This "loan tape" includes basic account information such as segment classification, status and identifiers of the loan/entity. It must be ensured that the data are of sufficient quality to perform the required analysis. This involves automated checks on the dataset and may also include subsequent inputs from the credit file review process. *This will take place from week 2 to week 10 of the AQR process, with additional findings from the credit file review being fed back up to the end of Phase 2.*

3. **Sampling:** A credit file review is carried out, under which specific details (such as loan classification and provisioning) of a particular credit (i.e. loan, advance, commitment or other off-balance-sheet exposure) are studied in detail. Given the volume of analysis involved, it is not possible to review all exposures in a portfolio. Therefore, sampling is conducted in a manner ensuring that the sample chosen is both large and representative enough to allow for robust analysis. The size of the sample will depend on the homogeneity of the portfolio, the risk of the portfolio, the total number of debtors and the level of debtor concentration. Samples can be expected to be in the range of 1-20% of a portfolio's total exposure. The sampling approach is consistent with best-practice adherence to ISA 530. *Sampling will take place immediately following DIV.*

4. **Credit file review:** The credit file review involves bank teams verifying that a credit exposure has been correctly classified in the bank's systems (e.g. correct regulatory segment, NPE status, impairment staging classification) and that, if a specific provision is required, it has been set at an appropriate level. The credit file review covers all loans, advances, financial leases and other off-balance-sheet items including specialised asset finance such as shipping and project finance. *The credit file review will begin with priority credits (i.e. top ten exposures by risk classification) in week 8 and continue for the remainder of the sample through to week 20.*

5. **Collateral and real estate valuation:** The valuation of collateral and/or on-balance-sheet real estate is a key input into determining appropriate carrying amounts. Generally, the majority of collateral is revalued for all debtors selected in the sampling that do not have a third-party valuation less than one year old. This is carried out by bank teams and feeds into steps 4 and 7. Some use of valuations by independent internal units may be allowed under specific circumstances described later in the document. *This analysis will start as soon as possible after the credit file review starts and will run in parallel with the credit file review between week 6 and week 18.*

6. **Projection of findings of credit file review:** The findings of the credit file review are then projected to the wider portfolio. Projection of findings is applied to homogeneous exposure pools (in line with audit guidelines). A pragmatic approach is applied, with a series of safeguards to avoid overestimation of misstatement due to sample size. *Projection of findings will take place between week 20 and week 23.*

7. **Collective provision analysis:** Smaller, homogeneous exposures are typically provisioned using a collective provisioning approach, i.e. a statistical model of expected credit losses. To verify that provisioning levels are appropriate, it is therefore critical to ensure that collective provisioning models are fully aligned with the letter and spirit of accounting rules (IFRS 9 or nGAAP). The proposals in this document are entirely consistent with these rules, to ensure alignment with accounting processes and standards. *This analysis will run from week 6 to week 28.*

8. **Fair value exposures review:** For banks with material level 2/3 exposures, a thorough revaluation of the most important exposures is carried out on a selective basis, i.e. not all exposures are analysed. For banks with material level 2/3 non-derivative exposure, a revaluation of the most important securities is carried out. For the banks with the largest trading books (as defined in the Phase 1 methodology), a qualitative review of core trading book processes (e.g. independent price verification (IPV), product approval, etc.) is carried out. This is combined with a quantitative review of the most important derivative pricing models (measured based on metrics such as level 2/3 gross mark-to-market). The expectation is that fewer than ten derivative pricing models will be reviewed for each bank included in the trading book review, depending on the size of the bank's exposure to level 2/3 derivatives. Some banks included in the trading book review will have no relevant level 2/3 derivative pricing models to review. *The fair value exposures review will be carried out between week 4 and week 22*.

9. **Determination of AQR-adjusted CET1% for use in the stress test and definition of remedial actions for banks following the AQR:** No change in the certified accounts of banks as at the AQR reference date is required (except in the unlikely event that the AQR highlights issues that would lead to restatement under local law, e.g. identification of accounting irregularities).[1]

   The expectation is that certain findings from the AQR will be reflected in the bank's accounts in the accounting period following the AQR reference date.[2] The following are examples.

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[1]   For IFRS banks, IAS 8 applies.

[2]   There is a possibility that some P&L adjustments that will be recognised as a result of the AQR may be booked to interim financial statements before the comprehensive assessment is completed – this will have to be factored into the final communication of the results with the banks and to the market.

- Corrections to specific provisions for individually impaired credit facilities that were sampled in the file review.

- Corrections to specific provisions for collectively impaired credit facilities, where the bank's collective provisioning model is viewed by the bank team as missing crucial aspects required under accounting rules (e.g. discounting based on the effective interest rate (EIR)). The expectation is that the bank will deal with this by correcting its internal models and policies (rather than mechanistically requiring the bank to apply the challenger model instead).

- Creation of a CVA for derivatives.

Other findings from the AQR will not be included in the accounts, as they are not explicitly required by accounting rules. For instance:

- the extrapolation of findings from sampled files to the wider portfolio;

- adjustments to collective provisions driven by factors other than bank misalignment with accounting rules;

- adjustments based on third-party or NCA valuations of level 2/3 securities driven by factors other than bank misalignment with accounting rules.

To correctly account for all AQR findings, an "AQR-adjusted CET1%" is calculated for each bank. This AQR-adjusted CET1% will be used to compute the final stress test outcomes. *Banks' breakdowns of the CET1% will be delivered and checked during between week 10 and week 22. The AQR adjustment calculation will be carried out after that.*

10. **Quality assurance:** A four-eyes principle should be applied by bank teams to ensure the quality of the exercise. The ECB will focus on ensuring overall consistency and a level playing field between all participating banks. Some flexibility is allowed in terms of the specific operating model that is applied by JSTs/NCAs for bank-specific or national quality assurance (QA) – this will be discussed and agreed by the CPMO with the JST/NCA on a case-by-case basis. *QA will be carried out throughout the process.*

Tools supporting the AQR

Executing the AQR will require several types of tools to supplement this manual. These can be divided into three categories and may be specific to a particular workblock.

- **Illustrative models and parameter sheets:** these will be issued to provide guidance on specific calculations required during the AQR

- **Templates:** these are used to collect information for QA purposes and will be provided to the bank team to populate during the review

- **Output reports:** these will be produced by the bank team and used to deliver the final results to the CPMO and/or banks

Illustrative models and parameter sheets

A series of illustrative models and parameter worksheets are either provided with this manual or will be provided separately. The models and parameters are aligned with the workblocks set out above and are described in more detail below.

Table 1

Illustrative models and parameter sheets

Subject	Relevant manual section	Illustrative model/parameter sheet
Sampling error simulation example	3. Sampling	Step-by-step example of sample size calculation process and simulation of the projection of findings, including sampling rates
Collateral and other macro indices	4. Credit file review and 7. Collective provision analysis	Parameter sheet for collateral indices and other macro indices
Projection of findings	6. Projection of findings of credit file review	Step-by-step example of projection process on AQR results
Migration matrix conditioning	7. Collective provision analysis	Step-by-step example calculation of Vasicek/Merton-style conditioning of migration matrices and Z&R value derivation
Loan tape data aggregation	7. Collective provision analysis	Step-by-step example for the aggregation of loan tape data for collective provisioning
LGL – retail mortgage	7. Collective provision analysis	Step-by-step example calculation of LGL for retail mortgages, with parameters and definitions
LGL – credit cards	7. Collective provision analysis	Step-by-step example calculation of LGL for credit cards, with parameters and definitions
LGI – corporate	7. Collective provision analysis	Step-by-step example calculation of LGI for corporates, with parameters and definitions
Scenario weights	7. Collective provision analysis	Example calculation for deriving probability weights for macroeconomic scenarios
Natural language processing (NLP) tool	8. Fair value exposures review – booking review	Proof of concept illustrating the NLP sampling process

Templates

The CPMO will provide a series of templates to support bank teams in carrying out the AQR. In some cases, the templates will be submitted to the CPMO at regular intervals to provide an update on progress.

Note: Templates related to the project management office (PMO) are not covered in this document. For information on this topic please refer to the CPMO.

Table 2

Templates

Workblock	Template	Summary of contents	Frequency of submission to CPMO
1. Processes, policies and accounting (PP&A) review	T1a. Processes, policies and accounting review assessment template	Questionnaire covering the questions defined for the processes and policies review Either codified answers are provided for each question and/or space is provided for free text answers	At end of PP&A process
	T1b. Conduct framework assessment template	Questionnaire for the conduct framework assessment, including proposed remedial actions	Intermediate submissions upon discussion with CPMO
	T1c. Top risks assessment template	Questionnaire covering the top risks assessment, including proposed remedial actions	Intermediate submissions upon discussion with CPMO
	T1d. Assessment of provision-setting approach	Questionnaire covering the assessment of the provision-setting approach Template for quantitative information on provisions and losses on current and historical cases	Intermediate submissions upon discussion with CPMO
	T1r. Staging backstops template	Complementary template for the assessment of staging backstops	Once, as per indicative timeline
	CVA challenger model	Tool calculating an estimate of CVA based on benchmark parameters	At end of CVA challenger model analysis
2. Loan tape creation and DIV	T2A. Loan tape and other data dictionary	Provides dictionary for all fields required in the loan tape Acts as a checklist for bank teams to ensure banks have provided all data required	Not required to be submitted
	T2B. DIV monitoring template	Red/Amber/Green assessment template for each check prescribed for DIV for each field/combination of fields	Weekly update of work in progress (WIP) template provided
3. Sampling	T3. Sampling rates template	Tool to determine sampling rates for each portfolio for each stratum	Interim update two weeks into DIV Final update two days after completion of DIV
4. Credit file review	T4A. Credit file review data preparation template	Template for banks to complete with key information on individual debtors[3] that have been sampled (to streamline file analysis process for bank teams)	Not required to be submitted
	T4B. Credit file review findings template	Template capturing findings from credit file review for each debtor	Weekly submission of WIP template
5. Collateral and real estate valuation	T5. Collateral and real estate valuation template	Template to capture information around collateral revaluations	Weekly submission of WIP template
6. Projection of findings of credit file review	T6. Projection of findings tool	Tool that takes results of credit file review findings and projects findings for the unsampled exposure for the relevant portfolio Results from template are used in the AQR-adjusted CET1% ratio template	At end of task
7. Collective provision analysis	T7L	Loan tape data from WB2, augmented with segmentation criteria and staging data	One version to be submitted
	T7A	Multiple inputs required for the challenger model calculation (e.g. exposure at default (EAD) run-down profiles, historic provisions & recoveries, Z&R factors for PD conditioning)	One version to be submitted
	T7B Collective provision results template	Template to compare results of challenger model with bank's calibration record results of the model review Results from template are used in the AQR-adjusted CET1% ratio template	Two versions to be submitted: results based on analysis of loan tape with no adjustment for credit file review results with adjustment for

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[3]   Debtor defined as per EBA ITS guidelines

Workblock	Template	Summary of contents	Frequency of submission to CPMO
		credit file review	
8. Fair value exposures review	T8A. Revaluation of non-derivative assets findings template	Template to present results of revaluation of non-derivative assets Results from template are used in the AQR-adjusted CET1% ratio template	Once complete
	T8B. Core trading book processes review findings template	Template containing questionnaire for core process review Includes codified definitions for Red/Amber/Green assessment of each element of the review	Once complete
	T8C. Derivative pricing model review findings template	Template containing questionnaire for core process review Includes codified definitions for Red/Amber/Green assessment of each element of the review Also captures quantitative adjustments for all in-scope pricing models	Interim update provided once questionnaire is complete, then fortnightly
	T8D. Booking review findings template	Template to record the sample of bookings selected for review and the findings of the review	Interim update provided once sample has been determined, then once review is complete
9. AQR-adjusted CET1% ratio	T9. AQR-adjusted CET1% adjustment tool	Tool to adjust bank CET1% ratios based on results of AQR	At end of task

Output reports

The bank team must produce a series of final outputs upon completion of each workblock. In some cases, this involves providing a final version of the template described above. In other cases, it involves producing a PowerPoint presentation of key issues. In the latter case, example PowerPoint structures will be provided.

Table 3

Outputs required from bank teams for the AQR

Workblock	Output
1. Processes, policies and accounting (PP&A) review	• Complete T1. Processes, policies and accounting review assessment template • O1B. PowerPoint presentation on all remedial actions that the bank is required to undertake following the CA as a consequence of the PP&A review • Complete T1b-T1d conduct risk assessment templates
2. Loan tape creation and DIV	• Complete T2B. DIV monitoring template • O2B PowerPoint presentation describing any remedial action that the bank should take as a result of DIV
3. Sampling	• Complete T3. Sampling rates template
4. Credit file review	• Complete T4B. Credit file review findings template • O4B PowerPoint presentation describing any remedial action that the bank should take as a result of the credit file review
5. Collateral and real estate valuation	• Complete T5. Collateral and real estate valuation template
6. Projection of findings of credit file review	• Complete T6. Projection of findings tool
7. Collective provision analysis	• Complete T7L and T&A Collective provisioning input templates • Complete T7B. Collective provisioning results template • O7B PowerPoint presentation describing any remedial action that the bank should take as a result of collective provision analysis
8. Fair value exposures review	• Complete T8A. Revaluation of non-derivative assets findings template • Complete T8B. Core trading book processes review findings template • Complete T8C. Derivative pricing model review findings template • Complete T8D. Booking review template • O8D PowerPoint presentation describing any remedial action that the bank should take as a result of the fair value exposures review
9. AQR-adjusted CET1% ratio	• Complete T9. AQR-adjusted CET1% calculation tool • O9B Draft letter to bank outlining actions that should be taken as a consequence of the AQR (referencing outputs O1B, O2B, O3B, O4B, O7B, O8D)

Technical assistance and discussion on Phase 2 methodology

The ECB will provide a central QA and technical assistance team to support the bank teams and NCAs, which will provide technical assistance in part via a "help desk" structure similar to that provided during Phase 1.

• NCAs and bank teams will be able to submit their questions, in a consolidated manner (max. one email per day), to a dedicated mailbox communicated at the start of the exercise

• The ECB will review questions and draft a response for inclusion in the next issue of frequently asked questions (FAQs)

• FAQs will be circulated to on a regular basis (typically twice per week)

• Weekly calls will be held to address common questions for the group in an interactive forum

Timelines

Indicative timelines are provided in each section of the manual as a general guide to assist bank teams and NCAs in the planning process. It should be emphasised that these are indicative, and specifically that bank teams may start/complete each process before these timelines; indeed, they are encouraged to do so to best assure on-time delivery of the overall project. A series of specific milestones will be provided to each bank team at the outset of the AQR, and may be further refined throughout the process. The CPMO may also adjust timelines on a bank-by-bank basis at the outset of the AQR to reflect case-specific circumstances.

1   Processes, policies and accounting review

This section provides detailed instructions for the bank team to follow in carrying out the PP&A review component of Phase 2, which comprises the following elements:

The general PP&A review, applicable to all banks subject to the AQR, is centred on ensuring that the bank has a robust set of clearly defined policies and processes for correctly interpreting accounting rules or other applicable industry standards in areas where any issues identified would be very likely to result in misstatement of the balance sheet value or to have a material impact on the AQR results. Broadly, this review includes the classification of exposures for measurement under amortised cost (cost), fair value (including the application of the IFRS fair value hierarchy) or the equity method, and the bank's internal policies and definitions relating to NPEs, forbearance, collateral valuation, provisioning and application of CVA to derivative holdings. Any issues identified will require remediation, either as part of Phase 2 or as soon as possible after the conclusion of the AQR.

The conduct risk review, applicable only to banks with material business from investment services and activities, focuses on conduct-related issues as a key source of risk to capital. It assesses the bank's overall framework for identifying and managing conduct risk, the adequacy of identification of and controls for a specific set of top risks, and the bank's practices on provisioning for conduct-related losses as evidenced by current and historical cases.

Finally, the CVA challenger model analysis, applicable to all banks subject to the AQR, provides a quantitative benchmark for banks' CVA on derivative holdings.

There may be quantitative outcomes from the PP&A review that directly impact on the determination of AQR-adjusted CET1%: amendments to carrying amounts due to reclassification of exposures from amortised cost to fair value through P&L or other comprehensive income, or the results of the CVA challenger model analysis.

1.1   General processes, policies and accounting review

1.1.1   Summary of approach

The general PP&A review focuses on the bank's processes and polices, in particular those related to key accounting decisions. Each section of the review is designed to assess bank practices against either relevant accounting standards[4] or objective

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[4]   IFRS or nGAAP as applicable.

criteria provided by the CPMO. There are 11 specific thematic areas to be addressed within the questionnaire template.

1. **Classification of financial instruments:** the classification and measurement of financial assets at amortised cost, fair value through profit and loss, and fair value through other comprehensive income within the meaning of IFRS 9, as well as treatment of equity positions, hedge accounting & derecognition

2. **Application of fair value hierarchy:** the classification of valuation inputs and corresponding exposures into the levels of the IFRS 13 fair value hierarchy, where level 3 exposures are those for which valuation is based on unobservable model input parameters

3. **Provisioning processes and policies:** governance arrangements and processes related to provisioning, policies and processes regarding the calculation of provisions, policies related to the treatment of collateral and the approach to write-offs

4. **Impairment staging criteria:** policies and practices concerning the classification of exposures according to the three stages of the IFRS 9 impairment model

5. **NPE definitions:** the definition of "non-performing" relative to the European Banking Authority (EBA) definition, including the treatment of forborne assets

6. **Forbearance and restructuring:** the restructuring policy, definition, identification and tracking of forborne assets, including the implications for provisioning

7. **Collateral valuation and disposal processes:** the processes relating to collateral valuation across collateral types and conservativeness of written policies

8. **Credit valuation adjustment calculation:** the existence and coverage of the bank's calculation of a CVA for derivatives

9. **Groups of connected clients and country of the ultimate borrower:** the processes in place to identify connected clients and determine the ultimate borrower's country of risk

10. **Deconsolidation processes:** the processes in place to decide when assets should be deconsolidated from the balance sheet

11. **Reserves for legal costs:** the approach the bank takes to defining reserves for litigation, etc.

The PP&A review is coordinated and conducted by bank teams; however, the review also incorporates a preliminary self-assessment element to allow the bank team to understand how the bank sees its own issues. In some (clearly indicated) cases, bank teams must not amend bank responses.

The assessment of thematic area 4 above (impairment staging criteria) includes an additional work step aside from the questionnaire-based review, concerning the application of staging backstops in the AQR, which the bank can opt to conduct (see Section 1.1.8 for details).

As a means for aggregate assessment of thematic areas, at the end of each section of the general PP&A review both the bank and bank team score the relevant practices of the bank (e.g. application of the IFRS 13 fair value hierarchy), making use of the following five-point scale:

Table 4

Five-point scale

Assessment	Guide
1: Poor practice in many areas or with some outside accounting principles	• Bank has more than one deviation from accounting principles in this area • Bank has more than five aspects of policies, processes or accounting relating to this area of the PP&A review that are considered below typical market standards
2: Poor practice in many areas or with any outside accounting principles	• Bank has one deviation from accounting principles in this area • Bank has more than three aspects of policies, processes or accounting relating to this area of the PP&A review that are considered below typical market standards
3: Within accounting principles and poor practice in some areas	Bank has more than one aspect of policies, processes or accounting relating to this area of the PP&A review that are considered below typical market standards
4: Within accounting principles and good practice in most areas	Bank has one aspect of policies, processes or accounting relating to this area of the PP&A review that is considered below typical market standards
5: Within accounting principles and good practice in all areas	Otherwise

Both banks and bank teams will also be asked to identify any issues or areas of interest within each section of the PP&A review that required further investigation.

The output of the review is a set of completed questionnaire responses that have been reviewed in full by the bank team together with an accompanying rationale and supporting evidence wherever appropriate, as well as a set of resulting remedial actions.

The processes, policies and accounting review is filled out for the bank at consolidated level, or at the level of the entity that is subject to the AQR (if below consolidated level). Additionally, further templates may be submitted focusing on subsidiaries, if the nature of the bank and its divergent performance across entities is felt to justify this. Where the bank is a group resulting from a recent merger or acquisition and responses relate to capabilities/policies/practices of the parent entity, the bank team should ensure that there is a credible plan to develop the capability, or should establish the policy/practice at the level of all subsidiaries and ascertain that responses for which this does not apply do not constitute a majority of responses. Where the latter is the case, the assessment for the given thematic area cannot exceed a "3" on the 5-point scale outlined above. However, it is expected that such circumstances will be discussed with the CPMO prior to submission of the review, and these are expected to be rare.

Subsidiaries for which no portfolios have been selected in Phase 1 of the AQR should not be considered in the answers to the general PP&A review.

The bank should provide supporting documentation to aid the bank team's completion of the review, although no supporting documentation is required alongside submission of the PP&A template to the CPMO.

Accordingly, a space has been provided in each template in which the bank should detail relevant supporting documentation for that section.

1.1.2 Indicative timeline

Table 5

Indicative timeline for general PP&A review

Task	Indicative date
Bank team commences review	Week 2
Bank submits completed staging backstops template	Week 2
Bank completes self-assessment	Week 4
CPMO receives final results	Week 9

1.1.3 Illustrative models, parameter sheets and templates

The following illustrative models, parameter sheets and templates are relevant to this workblock:

Table 6

Models, parameters and templates for PP&A review

Template	Summary of contents	Frequency of submission to CPMO
T1a – General processes, policies and accounting review assessment template	Questionnaire covering the questions defined for the processes and policies review Codified answers are provided for most questions with space for free text answers and accompanying rationale where required	At end of PP&A process
T1r – Staging backstops template	Complementary template for the assessment of staging backstops	Once as per indicative timeline above

Note that some areas of the review will not be relevant for nGAAP banks (e.g. for some aspects of the classification of financial assets and the fair value hierarchy). For these banks, the relevant questions should be interpreted in terms of equivalent nGAAP standards where possible, or ignored in the absence of a suitable comparison. If a question is ignored the bank team should state clearly why it is not relevant.

Note that allowances have also been made for the bank to indicate and elaborate upon instances where the results of particular sections of the PP&A differ markedly by subsidiary (below the SSM-consolidated level) and as such have affected the results of the review.

The remainder of this section is structured as:

- areas in scope for review;

- objective scoring for each question;

- outputs.

1.1.4　Areas in scope for review

Below is a list of the areas that will be covered as part of the review.

1. Classification of financial instruments

2. Application of fair value hierarchy

3. Provisioning

4. Impairment staging criteria

5. NPE definitions

6. Forbearance and restructuring

7. Collateral valuation and disposal processes

8. CVA calculation

9. Groups of connected clients and country of ultimate borrower

10. Deconsolidation processes

11. Creation of reserves for legal costs

These are discussed in turn below.

1.1.5　Classification of financial instruments

The classification of financial instruments is included in this review because any misclassifications may have a material impact on the balance sheet or P&L. For example, if any assets are incorrectly held at amortised cost but identified as needing to be accounted for at fair value through profit & loss or fair value through other comprehensive income, then this may result in misstatement of the CET1%. In the main, this section of the PP&A review references IFRS 9 accounting criteria for recognition and measurement of financial instruments and IAS 28 guidelines for investments in associates. The areas for investigation are detailed below.

- Policy for classifying financial assets as per IFRS 9 financial instrument classifications and resulting measurement (e.g. fair value vs amortised cost)

- Policy for the business model assessment and solely payment of principal and interest (SPPI) test required for the classification and resulting measurement of assets at amortised cost, fair value through profit and loss and fair value through other comprehensive income

- Treatment of derivatives (including embedded derivatives) at fair value in the banking book

- Bank designation of assets for hedging purposes and associated hedge accounting policies and procedures

- Treatment of material equity positions entered into as a result of debt restructuring

- Use of the equity method for valuing any material equity positions, and any policies in place for identifying whether the bank has "significant influence"[5]

- Bank practices for valuation of central bank equity positions

- Examples and accompanying rationale for recent instances of derecognition of financial assets

The bank's approach to accounting for credit default swaps (CDSs) is also examined in this section of the PP&A review. Under IFRS, CDSs meet the definition of a financial derivative and, unless designated as in an effective hedging relationship (which under IFRS 9 is extremely difficult for an instrument like CDSs), must be accounted for at fair value through profit and loss. Normally, under IFRS a CDS does not meet the definition of a financial guarantee contract as defined in IFRS 9 Appendix A, as in a standardised CDS contract the credit events triggering the payout may not relate directly to failure to pay on that particular debt instrument (e.g. an entity can hold a naked position, and the definition of credit events in a standardised CDS is broader than a failure to pay).

The output of the review will include remedial actions wherever issues are identified, so as to bring the bank into line with accounting standards during the AQR[6]. Any quantitative impact on available capital (e.g. as a result of reclassification of a group of assets to fair value accounting) will be calculated and disclosed as a part of the remediation process that follows the review.

1.1.6   Application of fair value hierarchy

The application of the IFRS 13 fair value hierarchy is included in this review, as any issues identified may have a material impact on the output of the fair value exposures review (see Section 8.2). For example, if a material portfolio of

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[5]   See IAS 28(2011).6

[6]   Any reclassifications required should be prioritised based on expected impact on available capital.

securitisations has been incorrectly classified as level 2 instead of level 3, these should be included as in scope for the non-derivative asset revaluation (see Section 8.2), which may result in an impact on the AQR-adjusted CET1% calculation (see Section 9.5). The areas for investigation are as follows:

- appropriateness of policies for the classification of assets into the IFRS 13 fair value hierarchy levels for each asset type;

- spot checks on positions classified as level 1 and level 2;

- investigation of any assets currently classified as level 1 or level 2 that are included in a specific list of product types *often* expected to be level 3 (e.g. illiquid or complex derivatives[7], private placements, bespoke securitisations, etc.) – a list of these cash and derivative products is provided, for each of which the bank must indicate if any such assets are classified at level 1 or level 2 and the bank team must indicate if it agrees with the classification choice.

The output of this section of the review may include additional remedial actions to bring the bank into line with accounting standards.

In addition, where the review may identify additional level 2/3 assets measured at fair value not originally included in the Phase 1 template, the bank team will be required to recheck materiality thresholds for inclusion of each asset type in the revaluation for non-derivative assets (see Section 8.2) as part of the AQR. This should be done based on the new total combined level 2/3 exposure values (both original and newly identified during the PP&A review).

1.1.7   Provisioning

Provisioning approaches are reviewed so that particular areas of misalignment or aggressive interpretation of accounting rules are identified ex ante. This will clearly have a bearing on expectations of misstatement relative to the AQR's minimum standards.

The areas for investigation are as follows:

- bank policies and practices for monitoring of client performance (e.g. types of covenant, behavioural analysis, etc.) by internal client segment;

- range of haircuts and assumptions applied by the bank to market value of collateral when setting provision levels for collateralised loans;

- provisioning practices under special circumstances (e.g. where the bank holds multiple tranches of the debtor's capital structure, etc.);

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[7]   For example, power reverse dual currency notes and equity basket quantos with single-name underlyings.

- suitability of bank write-off approaches;

- bank treatment and definition of cured assets for provisioning purposes, including forbearance considerations;

- appropriateness of use of collective provisioning methodology.

The output of the review may also include remedial actions, including requiring banks to adjust policies to bring provisioning practices into line with accounting rules following the CA.

1.1.8 Impairment staging criteria

The bank's approach to classifying exposures according to the three stages of the IFRS 9 impairment model is reviewed, as it is of key relevance for the credit file review and collective provisioning. Triggers applied by the bank to identify a significant increase in credit risk (SICR) in accordance with the IFRS 9 rules are a particular area of focus in understanding its approach to classifying assets as stage 1, 2 or 3.

In addition to completing the self-assessment part of the general PP&A questionnaire concerning staging criteria, the bank can opt to conduct an additional work step concerning the application of staging backstops in the AQR. This refers to a specific set of triggers treated as indicative of an SICR since initial recognition, meaning that any exposures for which those triggers are hit, but which are classified by the bank as stage 1, are reclassified as stage 2 for the purposes of the AQR. Staging backstops are applied at the outset of the sampling workblock, meaning that the sampling outcome will be based on the staging distribution of exposure after application of the backstops. The staging backstops are listed in **Table 7**.

Table 7

Backstops for SICR since initial recognition

Change in probability of default (PD)[1]	Lifetime PD of the exposure on the reporting date exceeds its lifetime PD at initial recognition by more than 200%
Absolute PD level	12-month PD of the exposure on the reporting date exceeds 20%
Delinquency (days past due)	Payments on the exposure are more than 30 days past due
Watch list, forbearance or restructuring status	Exposure is included on the bank's watch list, is flagged as forborne (as per EBA definition) or has been subject to restructuring
Low credit risk exemption	Only exposures with a 12-month PD exceeding 0.3% are to be considered for SICR assessment

1) It may be acceptable to assess this backstop by considering changes in 12-month PD rather than lifetime PD in cases where the bank uses this practical expedient for accounting purposes. In such cases, the bank is required to submit evidence to the CPMO demonstrating that changes in the 12-month PD of the portfolio concerned are a reasonable approximation for changes in its lifetime PD (i.e. showing that default patterns of the financial instruments in the portfolio are not concentrated at a specific point during their expected life).

The following two backstops are treated as a rebuttable presumption:

- absolute level of 12-month PD exceeding 20% at the reporting date;

- delinquency (contractual payments more than 30 days past due).

This means that if a bank is able to produce detailed evidence showing that, for a specific portfolio reviewed in the AQR, the level of one (or both) of these backstops is not indicative of SICR due to idiosyncratic features of the portfolio, the CPMO may agree to adjust the backstop to a different level after reviewing the evidence provided. Acceptable evidence must be both highly specific and comprehensive in accordance with the guidelines described in the template for each backstop. Where a bank proposes rebutting the level of a given backstop, it must propose an alternative level which it considers to better capture the portfolio's circumstances (e.g. use of 50, rather than 30, days past due).

The template also asks banks to identify any additional and/or more conservative backstops they have in use. Where these exist, they will be taken into consideration in the AQR, meaning that the identification of SICR in the AQR is at least as conservative as the bank's current approach.

1.1.9 Non-performing exposure definitions

The bank's internal definition of NPEs is included in this review, as any issues identified may have a material impact on the sampling process (see Section 3) used for the credit file review (see Section 4.4). For example, if the NPE definition includes all forborne loans, then the stratified sampling approach may require adjustment to reflect this. The areas for investigation are as follows:

- definition of non-performing as compared with the EBA definition;

- identification of any additional, more conservative elements in the bank's internal NPE definition;

- confirmation that the bank measures "days past due" in accordance with the requirements under the Capital Requirements Regulation (CRR).

1.1.10 Forbearance and restructuring

The treatment of forbearance and restructuring is included in this review, as any issues identified may have a material impact on the sampling process (see Section 3) used for the credit file review (see Section 4.4) and the identification of misstatement in the credit file review itself. For example, if the forbearance and restructuring review highlights aggressive use of interest-only concessions as a means of limiting past due, the bank team should be particularly mindful of this fact when assessing individual files for loss events relating to concessions. Furthermore, the PP&A review of bank forbearance policies provides an additional layer of scrutiny to the DIV assessment (see Section 2.6) of forbearance flagging in the loan tape, which constitutes a direct input into the sampling model (see Section 3.5).

The areas for investigation are as follows:

- bank policies for the identification and definition of forborne loans as per the EBA Implementing Technical Standards (ITS) guidelines;

- management information regarding forborne assets, including details of forbearance approaches offered, associated rationale and acceptance;

- policies for restructuring of distressed exposures for each segment, including range of treatments, prioritisation of treatments and impact on provisioning (e.g. when would the bank not classify a loan as credit-impaired at the point of forbearance?);

- difference in approach for performing vs non-performing credits for each segment;

- ensuring the policies that the bank applies to deconsolidating exposures following loan restructuring are appropriate and do not lead to inappropriate "re-ageing" of past due.

The output of the review may also include remedial actions to bank processes around forbearance and restructuring – in particular in relation to identification and reporting of forborne loans – to be completed following the CA.

1.1.11   Collateral valuation and disposal

In much the same way as for provisioning, the bank's collateral valuation approach should be assessed and understood in order to anticipate findings from the credit file review and collective provisioning processes. This will provide bank teams with the context to understand the potential for overestimation of recoveries for provisioning purposes.

The areas for investigation are as follows:

- use of consensual vs non-consensual foreclosure (historical and forward looking);

- collateral valuation processes by collateral type (CRE, RRE, shipping, etc.) including:

- frequency of collateral revaluation (including indicator of number of loans overdue for appraisal);

- type of valuation (e.g. market value, long-term economic value, replacement value, discounted cash flow (DCF), etc.);

- bank adjustments to collateral valuations through use of index price movements;

- priority of channel for disposal (e.g. auction, direct sale, sale through third party, etc.);

- expected and historical time to sale (from default to point of disposal);

- prudence of collateral valuation yield assumptions by region, primary/secondary, urban/rural and use.

The output of the review may include remedial actions concerning changes to collateral valuation policies (e.g. use of external appraiser valuation, approach to considering hope value) following the CA.

1.1.12 Credit valuation adjustment calculation

The existence of a calculation of CVA for the derivatives portfolio is included in this review, as any issues identified will have a direct impact on AQR-adjusted CET1%. For example, if the bank does not currently calculate CVA then a simplified approach to calculating CVA is used, where the result is directly deducted from available capital as part of the AQR-adjusted CET1% calculation[8] (see Section 9.5). The areas for investigation are as follows:

- existence of CVA (and debt value adjustment – DVA) calculation methodology for accounting purposes;

- appropriate use of PD, loss given default (LGD) and exposure parameters for CVA calculation purposes;

- portfolio coverage of the calculation (i.e. any material exclusions) by counterparty type (internal, monoline, etc.) and collateralised/non-collateralised split (including considerations for any materiality thresholds in place);

- determination of appropriateness of application and scope of bank CVA practices, indicating whether the bank is required to use the CVA challenger model as part of the remediation process.

The output of the review may include remedial actions (see Section 9.6), as well as a direct quantitative impact on the AQR-adjusted CET1% calculation. If it is indicated as a requirement in the PP&A template, the bank also completes the CVA challenger model to determine a quantitative impact (see Section 1.3).

The challenger model, distributed separately from the general PP&A template, determines the quantitative impact using an approximation of CVA based on the following:

- the bank's internal exposure projections where these exist and Basel EAD for derivatives where they do not (where no CVA is currently calculated[9]);

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[8] Note that debt valuation adjustment (DVA) gains are not included in AQR-adjusted CET1% (see Article 33 paragraph 1 (c) of the CRR).

[9] If this cannot be broken down adequately, a CVA approximation will be calculated for the full derivatives portfolio and any existing CVA as calculated by the bank will be deducted.

- market-implied PDs[10] by rating and maturity;

- LGD benchmarks (consistent with market-implied PDs).

This calculation is performed outside of the general PP&A template during the remediation period that follows the review, with the results taken as an input into the AQR-adjusted CET1% calculation template (see Section 9.5).

1.1.13   Groups of connected clients and country of ultimate borrower

The bank's understanding of its groups of connected clients and the classification of country of ultimate borrower are included in this review, as any issues identified will have a direct impact of the credit file review. For example, any misclassifications of country of risk for any debtor would result in a restatement of the Phase 1 template, and the incorrect treatment of two connected clients may lead to double-counting of collateral (e.g. in the case of second-lien mortgages). Furthermore, the sampling process for the credit file review relies on identification of debtors connected to those selected in the initial sample. The areas for investigation are as follows:

- methodology and system capabilities for producing a debtor-level view of the portfolio for non-retail clients, including links outside of consolidated legal entities;

- approach to considering links created by cross-collateralisation;

- bank policy for identifying a connection between clients in accordance with CRR requirements, including consideration of:

    - direct or indirect control by one client over another;

    - material economic dependency between clients;

- methodology for identifying the country of the ultimate borrower (including consideration of enforceability across the connected group).

The output of the review may include remedial actions in connection with the loan tape (see Section 2.6).

1.1.14   Deconsolidation processes

It is important to ensure that the processes that the bank applies to deconsolidation are in line with IFRS 10 (or nGAAP equivalent) accounting standards, as these processes determine the size and composition of the SSM-consolidated entity at

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[10]   Consistent with IFRS 13 guidance around the need for market-consistent parameters and other guidelines from the International Accounting Standards Board (IASB).

which banks report for the purposes of the AQR. Areas of investigation are as follows:

- bank determination of whether it controls another entity (within the meaning of IFRS 10);

- previous examples of material deconsolidations of assets by the bank, with accompanying circumstances, size and rationale for deconsolidation;

- specific assessment of whether bank policies around deconsolidation of complex structured transactions, such as the treatment of securitisation special-purpose entities (SPEs), meet accounting rules.

1.1.15 Creation of reserves for legal costs

Future costs relating to litigation are extremely material for many banks and can have a significant bearing on available capital. A high-level check on the processes that the bank has in place to size litigation reserves is carried out to ensure the suitability of bank treatment of such costs, including:

- bank policy for sizing litigation provisions (including example cases and associated drivers used for sizing provisions);

- frequency of review of reported provisions relating to litigation costs.

1.1.16 Objective assessment for each question

For each question in the general PP&A template, guidance is provided to enable the bank team to make an objective assessment of the bank. In most cases, questions are worded to ensure consistency with accounting principles, although questions may include further prescription in the form of ECB thresholds for prudential purposes, as described in the introduction. An example of this objective scoring for impairment staging policies and processes is shown below:

Worked example
Staging triggers

Question: What triggers for staging classification as per the IFRS 9 impairment model does the bank use?

Expected response: The bank uses the following triggers (yes or no).

Table 8

Example of objective assessment for PP&A review

Client segment	Triggers
Retail mortgage	• A loan/asset is more than 90 days past due (above materiality threshold) • A loan/asset is more than 120 days past due (above materiality threshold) • A loan/asset is more than 180 days past due (above materiality threshold) • A request for a forbearance measure from the debtor (as defined in EBA ITS guidelines) • A request for a forbearance measure from the debtor (where forbearance is defined as financial distress coupled with an improvement in terms for the client) • Client has another product which is classed as credit-impaired • Client has another product which has a credit-impairment trigger • A material decrease in rents received on a buy-to-let property • No rents being received on a buy-to-let property
Retail other	• A loan/asset is more than 90 days past due (above materiality threshold) • A loan/asset is more than 120 days past due (above materiality threshold) • A loan/asset is more than 180 days past due (above materiality threshold) • Client has another product which is classed as credit-impaired • Client has another product which has a credit-impairment trigger • A request for a forbearance measure from the debtor (as defined in EBA ITS guidelines) • A request for a forbearance measure from the debtor (where forbearance is defined as financial distress coupled with an improvement in terms for the client)
CRE or other asset finance (e.g. shipping)	• A loan/asset is more than 90 days past due (above materiality threshold) • A loan/asset is more than 120 days past due (above materiality threshold) • A loan/asset is more than 180 days past due (above materiality threshold) • A request for a forbearance measure from the debtor (as defined in EBA ITS guidelines) • A request for a forbearance measure from the debtor (where forbearance is defined as financial distress coupled with an improvement in terms for the client) • A material decrease in the property value • A material decrease in estimated future cash flows • The absence of an active market for the assets concerned • The absence of a market for refinancing options • A significant decline in the institution's credit rating of the debtor
SME portfolio triggers	• A loan/asset is more than 90 days past due (above materiality threshold) • A loan/asset is more than 120 days past due (above materiality threshold) • A loan/asset is more than 180 days past due (above materiality threshold) • A request for a forbearance measure from the debtor (as defined in EBA ITS guidelines) • A request for a forbearance measure from the debtor (where forbearance is defined as financial distress coupled with an improvement in terms for the client) • Trading losses • Diversion of cash flows from earning assets to support non-earning assets • A material decrease in turnover or the loss of a major client • A default or breach of contract • A significant decline in the bank's credit rating of the debtor

The following are examples of steps taken by the bank and bank team.

1. The bank reviews its own staging trigger documentation and provides preliminary answers for review by the bank team.

2. The bank team requests staging trigger documentation from the bank.

3. For each trigger listed, the bank team determines if the trigger (implicitly or explicitly) is included within bank policy.

4. The bank team amends the bank response in the PP&A template if necessary. It adds the rationale for the response, highlighting sources used and

consideration of proportionality given the specifics of the market (e.g. staging trigger may not be considered because it would imply that an inappropriate number of exposures would be triggered).

1.1.17 Outputs

The findings from the analysis will be used in three ways.

- To provide information to the bank teams to help guide the analysis throughout the remaining workblocks

- To identify quantitative adjustments that should be included in the stress test in relation to portfolios that should not be held at amortised cost and in relation to the outcome of the CVA challenger model analysis

- To specify remedial actions that the bank should make to its policies and processes for issues that are out of line with accounting principles

The following specific outputs will need to be produced for this workblock:

Table 9
Outputs for general PP&A review

Workblock	Output
1. General processes, policies and accounting (PP&A) review	• Complete T1a.General processes, policies and accounting review assessment template • O1B PowerPoint presentation on all remedial actions required to be undertaken by the bank following the CA as a consequence of the general PP&A review

1.2 Conduct risk review

1.2.1 General approach

The conduct risk review focuses on conduct-related issues as a key source of risk to capital. It comprises the following elements.

1. A **review of the bank's overall framework for identifying and managing conduct risk**, with the aim of assessing the bank's capacity to mitigate past, current and future conduct events

2. A **review of the bank's identification of and controls for a specific set of top risks**, with the aim of assessing the bank's capacity to identify risks in a structured manner, map risks to controls, assess the effectiveness of controls and identify residual risks

3. A **review of the bank's practices on provisioning for conduct-related losses**, with the aim of assessing the bank's capacity to adequately calibrate

and time the creation of provisions based on evidence from current and historical cases

The conduct risk review is carried out for banks to which both points 1 and 2 below apply.

1. The bank carries out any investment services and activities, as defined by MiFID II:

    - reception and transmission of orders in financial instruments;

    - execution of orders on behalf of clients;

    - dealing on own account;

    - portfolio management;

    - investment advice;

    - underwriting of and/or placing of financial instruments on a bank commitment basis;

    - placing of financial instruments without a bank commitment basis;

    - operation of a multilateral trading facility (MTF);

    - operation of an organised trading facility (OTF).

2. The bank meets one of the following criteria:

    - more than one-third of its income (before operating costs and impairments) is attributable to investment services and activities;

    - its annual income (before operating costs and impairments) from investment services and activities exceeds €500 million.

The conduct risk review is coordinated and conducted by the bank team; however, components 1 and 2 of the review also incorporate preliminary self-assessment elements to allow the bank team to understand how the bank sees its own issues.

1.2.2 Indicative timeline

Table 10

Indicative timeline for the conduct risk review

Task	Indicative date
Bank team commences review	Week 2
Bank completes self-assessments and submits relevant data/evidence for conduct framework assessment and top risks assessment	Week 9
Bank completes self-assessment and submits relevant data/evidence for assessment of provision-setting approach	Week 12
Bank team completes review of findings	Week 18
CPMO receives final results (findings and proposed remedial actions)	Week 21

1.2.3 Illustrative models, parameter sheets and templates

Table 11

Models, parameters and templates for the conduct risk review

Template	Summary of contents	Frequency of submission to CPMO
T1b – Conduct framework assessment	Questionnaire for the conduct framework assessment, including proposed remedial actions	Intermediate submissions upon discussion with CPMO
T1c – Top risks assessment	Questionnaire covering the top risks assessment, including proposed remedial actions	Intermediate submissions upon discussion with CPMO
T1d – Assessment of provision-setting approach	Questionnaire covering the assessment of the provision-setting approach Template for quantitative information on provisions and losses on current and historical cases	Intermediate submissions upon discussion with CPMO

1.2.4 Review of conduct risk framework

This review focuses on the bank's overall framework for managing conduct risk, assessing its capacity to mitigate past, current and future conduct events. It is carried out in the following steps.

1. The bank completes a self-assessment questionnaire covering 144 aspects across seven key themes:

    - governance;

    - risk management;

    - culture and people;

    - pre-sales and sales practices;

    - execution practices;

- advisory and origination;

- post-sales practices.

The bank should provide evidence in support of each individual response it gives. The bank team will place emphasis on the quality of the evidence provided in making its assessment. The template contains a description of expected evidence – this should be considered a minimum requirement and, where possible, the bank should provide additional information to substantiate its response.

2. The bank team challenges the bank's self-assessment based on the evidence provided by the bank. For each aspect reviewed, the bank team must indicate which of the following applies:

    - there is sufficient evidence to find the aspect fully addressed;

    - the bank has some capability, though there is insufficient supporting evidence to find the aspect to be fully addressed;

    - there is insufficient evidence to assess the capability or the bank team considers there is a deficiency (e.g. based on a "no" response from the bank or very weak/no evidence).

    The bank team should provide a rationale for its assessment of each aspect. In addition, the bank team should provide an overall assessment, drawing from the "results summary" sheet in the template and taking into account the following.

    - Some individual aspects have been categorised as "minimum expected capabilities" – deficiencies in these areas will be considered particularly material.

    - Where the bank is a subsidiary of a banking group and responses relate to capabilities/policies/practices of the group, the bank team should ensure that there is a credible plan to develop the capability, or establish the policy/practice at the bank (i.e. subsidiary) level and ascertain that responses referring to the group level do not constitute a majority of responses. Where the latter is the case, the overall framework will be considered deficient.

    - Where the bank's approach on a given aspect is not consistent across business lines, the bank team should ensure that the bank has provided an explanation indicating that the response relates to the weakest business line.

3. The bank team summarises its findings and proposes remedial actions for any deficiencies identified. Remediation suggestions should be prepared by detailing the evidence that would have been required for the bank team to conclude that "there is sufficient evidence to find the aspect fully addressed." This should be interpreted as a "long list" of all remedial actions. The Joint

Supervisory Team will use this long list as a basis for specifying a remediation plan for the bank including prioritisation of different remedial actions, deadlines, etc., i.e. the bank team is not required to make judgements on the latter aspects.

1.2.5 Review of top risk identification and controls

This review focuses on the following five elements:

- the structure of the bank's risk assessment;

- the nature of the "top risks" as identified by the bank;

- the bank's mapping of controls to risks;

- the effectiveness and scoring of preventative and detective controls for each risk;

- the bank's inherent residual risk assessment.

The high-level assessment steps are as follows:

1. the bank completes a self-assessment questionnaire;

2. the bank team challenges the bank's self-assessment based on the evidence provided by the bank;

3. the bank team summarises findings and proposes remedial actions for any deficiencies identified.

The specific responsibilities of the bank and bank team for each element of the assessment are described in **Table 12**.

Table 12

Overview of responsibilities in the review of top risk identification and controls

	Bank responsibilities	**Bank team responsibilities**
Structure of risk assessment	Bank provides its conduct risk assessment process and governance documentation	Bank team assesses the scope and structure of the approach
Nature of top risks identified	Bank provides a list of the top ten conduct risks and scores the inherent risk for each	Bank team reviews the "top risks" to assess whether the bank has identified the key risks inherent in its business model
Structure of controls mapping	Bank provides its control assessment process and governance documentation	Bank team assesses the structure of the approach and verifies whether the bank maps controls against individual risks
Control effectiveness assessment	Bank provides a list of preventative and detective controls (based on drop-down categories) in place for each of the top ten risks in the table Bank assesses the strength of those controls using an approach provided by the ECB (scored on a "Very Low"–"Very High" scale) Bank also provides an "overall control effectiveness" score using an approach provided by the ECB (scored on a "Very Low"–"Very High" scale) Where an inherent risk score for a specific business has been provided, the bank should include only controls which apply to that business Where the bank does not separate preventative and detective controls within its own assessment, the bank should do so for the purposes of the AQR exercise	The individual control effectiveness assessment is challenged based on an ECB-defined set of "maximum expected strengths" for each control type (e.g. effectiveness of "general policies" as a control can only be "Low") implemented in the relevant template Where the bank carries out an inherent risk assessment as part of its own methodology, the bank team should confirm that the bank's response in the template aligns with the bank's methodology There may be some differences in nomenclature (e.g. banks using a 0-10 or Low-High scale) – the bank team should use its judgement to assess whether the scores are consistent
Residual risk assessment	Bank provides its assessment of the residual risk for the top ten risks that it identified, using an approach provided by the ECB (scored on a "Very Low"–"Very High" scale) Where an inherent risk score for a specific business has been provided, the residual risk should also be provided for that business Where the bank does not separate inherent and residual risk in its own assessment, the bank should do so for the purposes of the AQR exercise Bank also provides an extract of its own assessment(s) showing how it has scored the risk as part of its methodology	Bank team challenges the residual risk assessment based on a defined logic as part of the assessment template, flagging areas of discrepancy Bank team should confirm that the bank's response in the template aligns with the bank's methodology There may be some differences in nomenclature (e.g. banks using a 0-10 or Low-High scale) – bank teams should use their judgement to assess whether the scores are consistent

For the purposes of the review, "conduct risk" is defined in accordance with EBA/GL/2014/13: "'Conduct risk' means the current or prospective risk of losses to an institution arising from inappropriate supply of financial services including cases of wilful or negligent misconduct."

Where a bank applies a different definition of conduct risk in its risk management, it specifies this in the relevant space in the template and uses it as a basis for the identification of its top ten conduct risks. The bank team assesses whether divergences between the EBA definition and the bank's own definition may have a bearing on the identification of top risks.

1.2.6 Review of provisioning for conduct losses

This review consists of two elements:

- a qualitative assessment of the bank's approach to setting provisions for conduct losses based on a questionnaire;

- a quantitative assessment of the evolution of provisions and losses on the bank's most material conduct cases over time.

The specific responsibilities of the bank and bank team with regard to both elements of the assessment are described in **Table 13**.

Table 13

Overview of responsibilities in the review of top risk identification and controls

	Bank responsibilities	**Bank team responsibilities**
Qualitative assessment	Bank completes the self-assessment template	• Bank team challenges the bank's submissions in the assessment template (T1d) based on evidence provided by the bank and guidance in the template • Bank team prepares a summary of findings and proposes remedial actions for any deficiencies identified
Quantitative assessment	Bank submits data on historical losses and provisions over the five years preceding the AQR reference date for the 25 most material conduct cases	Bank team analyses the evolution of provisions and losses over time in accordance with the instructions in the template

The data request forming the basis for the quantitative elements is aligned with the conduct risk component of the stress test. As such, only limited additional information is required, thus minimising the burden on the bank in gathering the relevant data. Accordingly, the following conventions apply.

- Conduct risk for the purposes of the template is defined as "the current or prospective risk of losses to an institution arising from inappropriate supply of financial services including cases of wilful or negligent misconduct." (EBA/GL/2014/13).

- For the purposes of reporting in the template, the assumption is that conduct risk losses will correspond to losses related to event type 4 ("clients, products and business practices") and event type 1 ("internal fraud" within the meaning of COREP template C 17.00. Deviations from this rule (i.e. non-conduct events that are classified as event type 1 or 4 or conduct events that are not classified as event type 1 or 4) are allowed in exceptional cases, subject to the approval of the competent authorities.

- The data provided by the bank in the AQR and stress test submissions must of course be consistent.

1.2.7   Outputs

Elements 1 and 2 of the conduct risk assessment (review of conduct risk framework and review of top risk identification and controls) and the qualitative component of element 3 (review of provisioning for conduct losses) will result in a list of specific actions required to remediate any deficiencies identified by the bank team. This list will be used by the Joint Supervisory Team as a basis for defining an action plan for

the bank to implement post-AQR. The list of findings concerning deficiencies will also be used as an input into the Supervisory Review and Evaluation Process (SREP) and thus inform the setting of Pillar 2 requirements. The findings of the quantitative component of element 3 (review of provisioning for conduct losses) will serve as a basis for QA of the bank's stress test projections on conduct losses, with potential adjustments to be implemented via the join-up of the AQR and the stress test.

Table 14

Outputs for conduct risk review

Workblock	Output
1. Conduct risk review	• Complete T1b – Conduct framework assessment template • Complete T1c – Top risks assessment template • Complete T1d – Assessment of provision-setting approach template

1.3   CVA challenger model

1.3.1   General approach

All banks within the scope of the AQR are required to complete the CVA challenger model. This involves providing accounting CVA exposure profiles, where these exist, and counterparty credit risk Basel EADs where a CVA is not currently calculated. The CVA challenger model then calculates an estimated CVA based on benchmark PD parameters estimated using current index CDS curves and a market-standard LGD parameter. The source of any significant deviations should then be understood.

Clearly, if the bank does not calculate CVA for a part of the derivatives portfolio, we would expect an obvious deviation when Basel EADs are applied. Using Basel EADs is by definition conservative; in these circumstances, banks are therefore allowed time following the PP&A to provide CVA exposure profiles for trades not initially included in the exposure profile. For the avoidance of doubt, it is not acceptable to assume that the CVA for a collateralised exposure is 0.

1.3.2   Indicative timeline

Table 15

Indicative timeline for CVA challenger model analysis

Task	Indicative date
Bank provides CVA input data	Week 12 – week 15
Bank team completes CVA challenger model analysis	Week 20
CPMO receives final results	Week 20

1.3.3 Illustrative models, parameter sheets and templates

Table 16

Models, parameters and templates for PP&A review

Template	Summary of contents	Frequency of submission to CPMO
CVA challenger model	Tool calculating an estimate of CVA based on benchmark parameters	At end of CVA challenger model analysis

1.3.4 Outputs

Table 17

Outputs for CVA challenger model analysis

Workblock	Output
1. CVA challenger model analysis	Complete CVA challenger model

2   Loan tape creation and data integrity validation

This section explains the analysis required to perform DIV and to decide on the remedial actions required as a result of findings. Following the executive summary and indicative timeline, it describes the contents of the core dataset for the DIV – the "loan tape" – and discusses the key definitions used for the AQR – most particularly the EBA NPE definition (EBA/ITS/2013/03/rev). It then goes on to describe the different types of DIV analysis that should be performed and the remedial actions that could be taken, depending on the findings from the DIV. Finally, the shape of the final report on DIV is discussed (including the incorporation of findings from the credit file review discussed in later sections).

2.1   Summary of the approach

- A critical part of the AQR exercise is improving the transparency of bank balance sheets. To achieve this, it must be ensured that the data provided by banks for use in the CA is of sufficient quality on key aspects such as exposure segmentation and missing information. Furthermore, any analysis to be performed concerning potential capital shortfalls and stress testing is predicated on a thorough understanding of the data issues. As a result, a thorough DIV approach is required.

- Loan tapes will be created by banks, covering data fields specified by the ECB. Automated checks are performed on the loan tape, first by banks (for basic transposition errors) and then by bank teams (for internal consistency checks). Automated checks include:

    - reconciliation checks (i.e. validating the bank's automated checks, confirming that the loan tape is consistent with source systems);

    - field-specific checks (identifying errors e.g. missing values; inappropriate values; incorrect formats; duplicate values, etc.);

    - cross-field checks (checks for inconsistency between fields e.g. credit > 90 days past due but no NPE flag; industry code consistent with segment definition, etc.);

    - sense-check on distribution of observations (e.g. retail mortgage exposure evenly distributed across LTV buckets with no exposure above 200% LTV; no "retail other" exposures > €1,000,000, etc.);

    - cross-time checks (e.g. loan that is > 90 days past due one year before the AQR reference date should not be flagged as "never been NPE" on the AQR reference date).

- During loan tape creation, bank teams are advised to prepare the necessary scripts for DIV.

- The DIV process should be a "straight-line" process that is executed within the time allowed. It should not result in continual reiteration of loan tape data. Instead, appropriately conservative remediation strategies should be applied to avoid the need for delays in the process while data are corrected.

- Some semi-automated checks should also be performed; these require some level of interaction with staff in the bank.

- Check with the bank validity of top 20/bottom 20 values of exposure fields.

- Check with the bank validity of any repeat entries of collateral value fields.

- A Red/Amber/Green assessment or equivalent is applied by the bank team (according to specification by the ECB) for each check, and a report is provided to the NCA, with a copy to the CPMO.

- Findings from the credit file review that have a bearing on DIV will also be an important element in the overall DIV assessment. Most specifically, the classification of credit exposures by AQR asset segment (e.g. aviation versus large corporates (non-real-estate)) and impairment status (i.e. stage of impairment) can only be fully checked by comparing the specifics of the case (described in credit files) with the loan tape. The associated analysis of this element of the DIV is described in the credit file review (Section 4).

- Loan tape DIV must be performed on all segments that are in scope for Phase 2. To ensure that the bank has not classified exposures as out of scope that should be in scope, the bank team should perform random spot checks on out-of-scope exposures that exhibit potential signs of misclassification. **If, and only if,** the random spot checks indicate that exposures have been misclassified, they should be included in the rest of Phase 2.

- Any adverse findings from DIV that may have a bearing on the analysis to be performed later in the AQR need to be addressed. For each adverse finding, the bank team must decide whether the finding is material. If it is material it must decide whether a workaround to address the issue without correcting the loan tape is possible (e.g. ignore EBITDA field for the purposes of analysis) or whether the bank will be required to correct the loan tape (without impacting the timelines for the AQR). The specific choice will depend on the materiality of the issue, the availability of a workaround and when the issue is identified (the later an issue is identified, the more likely it is that a workaround will be required).

2.2 Indicative timeline

Table 18

Indicative timeline for DIV

Task	Indicative date
Completion of spot checks on relevant exposures out of scope of Phase 2	Week 7
Delivery of loan tape data request	Week 6
Verification of bank transposition and check on totals by segment	Week 6
Preparation of DIV scripts completed by bank teams	Week 6
Field-specific checks	Week 7
Cross-field checks	Week 7
Cross-time checks	Week 9
Distribution checks	Week 9
Decision on remediation strategy for AQR	Week 10
Dataset available for sample selection	Week 10

2.3 Illustrative models, parameter sheets and templates

The following illustrative models, parameter sheets and templates are relevant to this workblock:

Table 19

Illustrative models, parameter sheets and templates for DIV

Template	Summary of contents	Frequency of submission to CPMO
T2A. Loan tape and other data dictionary	• Provides dictionary for all fields required in the loan tape • Acts as a checklist for bank teams to ensure banks have provided all data required	Not required to be submitted
T2B. DIV monitoring template	Red/Amber/Green assessment template for each check prescribed for DIV for each field/combination of fields	Weekly update of WIP template provided

2.4 Creation of the "loan tape"

The loan tape collection is the first step required in Phase 2 analysis, to enable subsequent completion of DIV, sampling and the collective provisioning challenger model. The loan tape is split into four requests, mirroring the AQR asset segments. For non-retail segments (corporates, institutions, sovereigns and supranational non-governmental organisations) the tape is split into three; the facility, collateral and debtor tapes. For these portfolios, facility and collateral information are aggregated to debtor level. Three further tapes for retail SME, RRE and other retail are requested at facility level.

The loan tape should contain all the credit exposures from the portfolios selected during Phase 1, which will be communicated to banks in preliminary form at the start of Phase 2, plus the credit exposures from portfolios connected to those. Within these portfolios, the loan tape should contain information about all loans and advances and debt securities (excluding securitisations) that are held at amortised cost. In addition, off-balance-sheet exposures (loan commitments, financial guarantees and other commitments) should be included (excluding derivative notionals). All securities financing transactions with variation margin agreements (e.g. reverse repos) should be excluded. **Only facilities with a sum of on-balance-sheet and off-balance-sheet exposure above €100 for retail and €1,000 for non-retail should be included in the loan tape.**

Monetary values must be provided in integer euro amounts. If conversion from other currencies is necessary, the exchange rate at the snapshot date should be applied. This exchange rate should be from the source that the bank uses for financial reporting.

Some fields are to be completed on **a best-efforts basis** and are specified as such in their description. Banks should be strongly encouraged to provide these fields, as they are used to reduce the scope of the sampling process – ultimately it is in the bank's interests to provide the field. However, if this is not feasible in the timeframe, they may be disregarded.

Banks will be required to collate these tapes following the specifications about perimeter, required snapshots, field definitions and other technical aspects as outlined below. The loan tape must be created in a standardised way, exportable as, for example, a .txt or .csv file or in plain text format without delimiters, in which case it may be required that each field must be of a fixed length. A single tape should be exported for each in-scope portfolio. For instance, if CRE Germany is in scope this would involve exporting three files: for the facility, collateral and debtor views respectively. If retail SME is in scope, a single file can be exported. The loan tapes should be submitted to the NCA and the CPMO together with the DIV template as soon as the bank team deems the quality of the loan tape to be sufficient.

Table 20

Additional segments for which data must be submitted for each in-scope portfolio

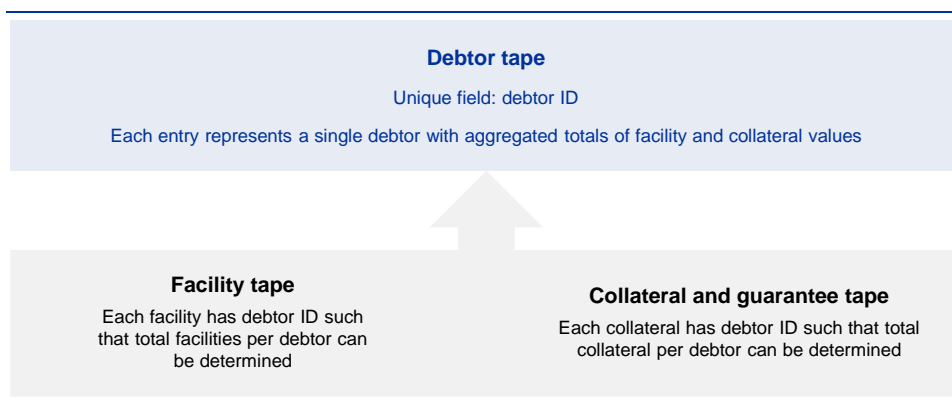| In-scope segment	Additional segments for which data must be submitted
CRE	Selected parts of SME corporate and large corporate in same country
Shipping	Selected parts of SME corporate and large corporate in same country
Aviation	Selected parts of SME corporate and large corporate in same country
Large corporate	SME corporate in same country with turnover > €50 million (exposure > €50 million if turnover information not available)
SME corporate	Large corporate in same country Retail SME in same country with exposure greater than €1 million

Two snapshots of data are required:

- AQR reference date (for the DIV and loan tape data, referred to as T_0);

- one year before the AQR reference date (for DIV and loan tape date, referred as T$_{-1}$).

2.4.1   Data structure – non-retail exposures

Exposures that are not classified as retail under the AQR asset segmentation should be reported under the non-retail data structure. The request consists of three tapes: the facility, collateral and guarantees and debtor tapes. Aggregation of facilities and collateral is performed at debtor level, and as such debtor IDs are required for all facilities and collateral so that successful aggregation can be completed.

Figure 2
Data structure

> **Debtor tape**
> Unique field: debtor ID
> Each entry represents a single debtor with aggregated totals of facility and collateral values

> **Facility tape**
> Each facility has debtor ID such that total facilities per debtor can be determined

> **Collateral and guarantee tape**
> Each collateral has debtor ID such that total collateral per debtor can be determined

Facility tape

The "facility tape" dataset contains the information about individual exposures, i.e. individual commitments with unique terms under a credit agreement, such as product type, maturity date, interest rate, etc. Each facility in the dataset must contain a debtor ID enabling it to be mapped to the correct debtor. If a facility belongs to multiple debtors then it must be entered multiple times to account for this. There may therefore be repetition of the facility ID and other facility information in two separate entries with two different debtor IDs. However, the exposure information provided for each entry should be specific to the debtor and not aggregated across debtors. The unique field in the facility tape is a concatenation of the facility and debtor IDs.

Collateral and guarantees tape

The "collateral and guarantees tape" dataset contains the information about **all the funded risk-mitigating techniques and unfunded risk-mitigating techniques as eligible under the CRR**, i.e. assets or rights of value that are committed for the fulfilment of the terms of a loan. The tape should reflect the level of granularity of collateral information that exists in the bank's system. All collateral in the dataset

must contain a debtor ID enabling it to be mapped to the correct debtor. If an item of collateral is associated with multiple debtors then it must be entered multiple times to account for this. This would involve repeating the collateral identification information across the entries for each debtor ID; however, the allocated amount must be specific to the debtor. The unique field in this tape is a concatenation of the debtor and collateral IDs.

Debtor tape

The "debtor tape" dataset contains information about the debtors included in the dataset. "Debtor" means an obligor within the meaning of the CRR. The unique debtor ID allows aggregation of facilities and collateral at debtor level. **It is expected that for corporate exposures there may be multiple facilities and items of collateral for a given debtor.**

2.4.2 Data structure – retail exposures

For retail exposures there is a simplified request for customised single tapes for each retail SME, RRE and other retail exposure. These requests are defined at facility level, with each entry representing a single facility and the associated collateral (RRE only). These will create single entries in the database, meaning that if there are multiple collateral items connected to a facility, the collateral value/allocated amount information for this entry must include all these collateral items grouped together (i.e. the sum). Other collateral fields (collateral ID, collateral type, collateral location (country and region) and date of last appraisal) should be populated with information of the primary collateral, which is the item with the highest value allocated to the facility. Unique fields are a concatenation of facility and debtor IDs.

2.4.3 Fields to be included

The fields to be included in the loan tape are listed below:

Non-retail exposures – facility fields

- Snapshot date (R_SNAP_F)

- Booking entity ID (R_ENTITY)

- System reference ID (R_SYSTEM)

- Booking country (R_COUNTR)

- Branch ID (R_BRANCH)

- Internal facility ID (R_IDFF)

- Internal debtor ID (R_IDFD)

- AQR asset segment facility (S_AQRASF)

- Regulatory exposure segmentation according to CRR (S_CRR)

- Current contractual maturity (B_RESMAT)

- Product type (B_PROD)

- Currency (B_CURR)

- EIR (B_EFFRAT)

- Current interest rate (B_CURRAT)

- Name of asset protection scheme (B_PROT)

- Lifetime PD at origination (PD_OL)

- Lifetime PD at reporting date (PD_CL)

- 12-month PD at origination (PD_O12)

- 12-month PD at reporting date (PD_C12)

- On-balance-sheet exposure (E_ONBAL)

- Off-balance-sheet exposure (E_OFFBAL)

- Credit conversion factor (E_CCF)

- Watch list (S_WATCH)

- Stage under IFRS 9 (S_STAGE)

- Current number of days past due (D_DPD)

- Forborne – according to internal definition (FO_INT)

- Date of last restructure (R_LR)

- Individual or collective provisioning (P_PROVF)

- Stage 3 (credit-impaired) provisions (P_CI)

- Stage 1 and 2 (SICR) provisions (P_NCI)

- Credit quality step of the debtor at origination (R_CREDQO)

- External rating at origination (R_EXTRATO)

- External rating agency used at origination (R_RATAGO)

Non-retail exposures – collateral and guarantees fields

- Snapshot date (R_SNAPC)

- Internal collateral ID (R_IDCC)

- Internal debtor ID (R_IDFD)

- Collateral type (C_TYPE)

- Country (C_COUNTR)

- Region (C_REGION)

- Credit protection value (C_VAL)

- Internal/external appraisal flag (C_FLAG)

- Date of last appraisal (C_DATE)

- Allocated amount (C_COVER)

Non-retail exposures – debtor fields

- Snapshot date (R_SNAPD)

- Debtor name (R_NAME)

- Internal debtor ID – unique field (R_IDFD)

- Internal ID for group of connected clients (R_IDCC)

- Identification of whether the debtor is a related party (R_RELATD)

- Geography (R_GEOGD)

- AQR asset segment (S_AQRSD)

- NACE code of the debtor (S_NACED)

- NPE according to internal definition (S_NPEINT)

- NPE according to EBA definition (S_NPEEBA)

- NPE in last 12 months (S_NPE12M)

- Total debt of the debtor (B_DEBT)

- Total equity of the debtor (B_EQ)

- Total EBITDA of the debtor (B_EBITDA)

- Total assets of the debtor (B_ASSET)

- Credit quality step of the debtor (R_CREDQ)

- External rating (R_EXTRAT)

- External rating agency (R_RATAG)

Retail SME exposure fields

- Snapshot date (R_SNAPF)

- Booking entity ID (R_ENTITY)

- System reference ID (R_SYSTEM)

- Internal facility ID (R_IDFF)

- Internal debtor ID (R_IDFD)

- Geography (R_GEOGF)

- AQR asset segment – facility (S_AQRASF)

- Current contractual maturity (B_RESMAT)

- Product type (PROD)

- Currency (B_CURR)

- EIR (B_EFFRAT)

- Current interest rate (B_CURRAT)

- Name of asset protection scheme (B_PROT)

- On-balance-sheet exposure (E_ONBAL)

- Off-balance-sheet exposure (E_OFFBAL)

- Credit conversion factor (E_CCF)

- NPE according to internal definition (S_NPEINT)

- NPE according to EBA (S_NPEEBA)

- Watch list (S_WATCH)

- Has the facility been credit-impaired in the last 12 months (S_CI12M)

- Stage under IFRS 9 (S_STAGE)

- Days past due (D_DPD)

- Forborne according to internal definition (FO_INT)

- Date of last restructure (R_LR)

- Lifetime PD at origination (PD_OL)

- Lifetime PD at reporting date (PD_CL)

- 12-month PD at origination (PD_O12)

- 12-month PD at reporting date (PD_C12)

- Individual or collective provisioning (P_PROVF)

- Stage 3 (credit-impaired) provisions (P_CI)

- Stage 1 and 2 (SICR) provisions (P_NCI)

RRE exposures fields

- Snapshot date (R_SNAP_F)

- Booking entity ID (R_ENTITY)

- System reference ID (R_SYSTEM)

- Booking country (R_COUNTR)

- Branch ID (R_BRANCH)

- Internal facility ID (R_IDFF)

- Internal debtor ID (R_IDFD)

- Geography (R_GEOGF)

- AQR asset segment (S_AQRASF)

- Regulatory exposure segmentation according to CRR (S_CRR)

- Current contractual maturity (B_RESMAT)

- Channel (B_CHAN)

- Product type (B_PROD)

- Currency (B_CURR)

- EIR (B_EFFRAT)

- Current interest rate (B_CURRAT)

- Name of asset protection scheme (B_PROT)

- On-balance-sheet exposure (E_ONBAL)

- Off-balance-sheet exposure (E_OFFBAL)

- Credit conversion factor (E_CCF)

- Loan to income ratio (E_LIR)

- NPE according to internal definition (S_NPEINT)

- NPE according to EBA (S_NPEEBA)

- NPE in last 12 months (S_NPE12M)

- Stage under IFRS 9 (S_STAGE)

- Current number of days past due (D_DPD)

- Forborne according to internal definition (FO_INT)

- Date of last restructure (R_LR)

- Lifetime PD at origination (PD_OL)

- Lifetime PD at reporting date (PD_CL)

- 12-month PD at origination (PD_O12)

- 12-month PD at reporting date (PD_C12)

- Individual or collective provisioning (P_PROVF)

- Stage 3 (credit-impaired) provisions (P_CI)

- Stage 1 and 2 (SICR) provisions (P_NCI)

- Internal ID collateral (R_IDCC)

- Collateral type (C_TYPE)

- Country (C_COUNTR)

- Region (C_REGION)

- Credit protection value (C_VAL)

- Internal/external appraisal flag (C_FLAG)

- Date of last appraisal (C_DATE)

- Allocated amount (C_COVER)

- Value of loss insurance (C_VALINS)

Other retail exposures fields

- Snapshot date (R_SNAPF)

- Booking entity ID (R_ENTITY)

- System reference ID (R_SYSTEM)

- Internal facility ID (R_IDFF)

- Internal debtor ID (R_IDFD)

- Geography (R_GEOGF)

- AQR asset segment (S_AQRASF)

- Current contractual maturity (B_RESMAT)

- Channel (B_CHAN)

- Product type (PROD)

- Currency (B_CURR)

- EIR (B_EFFRAT)

- Current interest rate (B_CURRAT)

- Name of asset protection scheme (B_PROT)

- On-balance-sheet exposure (E_ONBAL)

- Off-balance-sheet exposure (E_OFFBAL)

- Credit conversion factor (E_CCF)

- NPE according to internal definition (S_NPEINT)

- NPE according to EBA (S_NPEEBA)

- NPE in the last 12 months (S_NPE12M)

- Stage under IFRS 9 (S_STAGE)

- Days past due (D_DPD)

- Forborne according to internal definition (FO_INT)

- Date of last restructure (R_LR)

- Lifetime PD at origination (PD_OL)

- Lifetime PD at reporting date (PD_CL)

- 12-month PD at origination (PD_O12)

- 12-month PD at reporting date (PD_C12)

- Individual or collective provisioning (P_PROVF)

- Stage 3 (credit-impaired) provisions (P_CI)

- Stage 1 and 2 (SICR) provisions (P_NCI)

2.4.4   NPE definition – according to EBA definition

On 21 October 2013, the EBA issued final draft ITS on forbearance and NPEs. The ITS were to be implemented by 31 December 2014. As such, a full NPE definition in line with the EBA definition set forth in the EBA final draft ITS on supervisory reporting on forbearance and non-performing exposures under Article 99(4) of Regulation (EU) No 575/2013 should be in place for both loan tape snapshots.

According to paragraph 145 of Annex V of the EBA ITS on supervisory reporting, NPEs are those that satisfy either or both of the following criteria:

- material exposures which are more than 90 days past due;

- the debtor is assessed as unlikely to pay its credit obligations in full without realisation of collateral, regardless of the existence of any past-due amount or of the number of days past due.

The definition of NPEs is therefore based on the "past due" criterion and the "unlikely to pay" criterion.

Definition of exposure

- Any facility that is an NPE must be classed as NPE.

- For retail: NPE is defined at facility level.

- For non-retail: NPE is defined at debtor level. If one material exposure is classified as NPE, all exposures to this debtor level will be treated as NPE.

- Materiality is defined in line with the EBA ITS guidelines (i.e. in accordance with Article 178 of the CRR), and hence in line with national discretion.

- Off-balance-sheet exposures are included. Derivative and trading book exposures are not included, in accordance with the EBA ITS.

Forbearance should if possible be aligned with the EBA ITS definition of forbearance; otherwise an internal definition should be used instead. Consideration of forbearance is not excluded from the AQR – it is addressed both in specific credit file reviews of concession-related impairment staging triggers for IFRS banks (as defined in IFRS 9) and in reviews of restructuring/forbearance policies and processes. For nGAAP banks, inclusion of forbearance is on a best-efforts basis. Findings from file reviews

may lead to adjustments to NPE ratios as a consequence of forborne loans being reclassified as credit-impaired and therefore being classified as NPE.

2.4.5   Inclusion of data for segments not in scope for Phase 2

Loan tape DIV is to be performed on segments that are in scope for Phase 2 only. However, it is possible that a bank may not correctly classify exposures according to the portfolio segments defined for the AQR. To ensure that this is not the case, the bank team will perform random spot checks on exposures exhibiting characteristics that could indicate potential misclassification.

To do this, sub-portfolios exhibiting characteristics that suggest they could be misclassified should be included in the loan tape. This is to avoid potential process risks that would result if misclassifications are identified and extra exposures need to be added to the loan tape later in the exercise.

Only sub-portfolios that are in the same country as the relevant in-scope portfolio should be included in the loan tape. Only exposures that are on the same source system as the in-scope portfolios should be included in the loan tape (to make the process straightforward for banks). Only exposures which show signs of misclassification, as described below, need be included in the loan tape. These exposures should be included in the tape of the in-scope segment only if they are not in scope themselves. For example, if shipping Germany is in scope, exposures that are large corporate or SME corporate in Germany, have an NACE code related to shipping or collateral that is a ship and are on the same source system as any of the shipping Germany exposures should be included in the loan tape **only if SME corporate/large corporate Germany are not themselves in scope.** These exposures will be included in both snapshots T_0 and T_{-1} (as there must be continuity between the two snapshots).

Table 21

Signs of potential misclassification for segmentation checks

In-scope segment	Additional segments to be checked for inclusion in scope	Potential sign of misclassification in segments not defined as in scope
CRE	SME corporate and large corporate in same country	1a. NACE code is related to the relevant industry (F41, F43, L68) 1b. Product type is term loan or mortgage with committed and/or uncommitted limit > 50% of drawn balance (indicative of asset finance in development phase). Maturity is medium-term i.e. > 1 year. Exposure > €5 million 1c. Long-term secured facility with relatively low average interest rate compared with other corporate exposures 1d. Product code indicates some form of development finance
Shipping	SME corporate and large corporate in same country	2a. NACE code is related to the relevant industry (C30, C33, G46, H50) 2b. For shipping, collateral type is a ship
Aviation	SME corporate and large corporate in same country	3a. NACE code is related to the relevant industry (C30, C33, G46, H51) 3b. For aviation, collateral type is an aircraft
Large corporate	SME corporate in same country with turnover > €50 million (exposure > €50 million if turnover not available)	4a. SME corporate in same country with turnover > €50 million (exposure > €50 million if turnover not available)
SME corporate	Large corporate in same country Retail SME in same country with exposure greater than €1 million	5a. Aggregate exposure greater than €1 million 5b. Turnover < €50 million

Random spot checks should be performed on the exposures that show signs of misclassification. The bank team therefore needs to randomly select debtors that exhibit characteristics of misclassification and perform the necessary checks.

For each of the potential signs above (1a to 5b), ten debtor IDs should be selected at random and basic checks performed on the nature of the counterparty, including:

- performing a web search on the company;

- reviewing the electronic credit mark-up for the counterparty;

- speaking to the relationship manager (RM) responsible for the counterparty.

Bank teams should ensure, and be able to demonstrate, that debtors are selected at random.

If more than one of the ten debtors has been misclassified then either all exposures with the potential signs of misclassification above should be included in the scope for Phase 2 or all exposures with that particular sign of misclassification should be checked (this must not impact the timeframe for the exercise). For example, if two out of ten debtors with the NACE real estate code should be considered CRE and there is no other way to verify the remaining exposures, then all exposures with a NACE code of real estate should be included in Phase 2.

If any misclassification issues are identified, the perimeter for inclusion within Phase 2 should be extended and the relevant segmentation reclassified. Any misclassification issues should be highlighted in the reporting template and reported to the NCA and the CPMO. The NCA should satisfy itself that any misclassification issues have been suitably dealt with.

2.4.6   Other technical aspects

Each bank can use data manipulation software of its choice if this offers the standard features and, in particular, can easily export and import data in plain text formats (e.g. csv, txt, or plain ASCII without delimiters, etc.).

2.4.7   Required snapshots

Two snapshots of data are required:

- AQR reference date (for the DIV and loan tape data, referred to as T_0);

- one year before the AQR reference date (for DIV and loan tape data, referred to as T_{-1}).

All fields are required for the T_0 snapshot. However, only a reduced data request is required for T_{-1} (further specified in the loan tape template). These two snapshots should be exported as separate files. Banks may use pro-forma consolidation statements provided that the highest quality standards are preserved (no material divergences should appear between pro-forma information and the official statements finished two/three months later). Two snapshots are required for the calculation of cure rates and probability of impairment in the collective provisioning analysis, and as such are vital to the exercise.

2.4.8   Definitions

It may be that specific information is not available for loan tape completion or that specific fields are not required for a given entry. Conventions apply in these cases: "not applicable" will be designated "N/A" for text and "11111111111" for numeric fields, while "missing information" will be designated "MISS" for text and "99999999999" for numeric fields. For the avoidance of doubt, "missing" means that the bank does not have access to the information; "not applicable" means that the field is not required for a given facility/collateral/debtor or does not apply to that bank, e.g. "Name of asset protection scheme" if there is no scheme protecting a given exposure. As a further example, if a facility has no off-balance-sheet exposure this would be entered as "0", rather than being classed as "not applicable".

2.4.9   Provisions

If a bank cannot allocate provisions at the level required (for example the provisions calculated for stage 2 exposures) then additional qualitative information is requested to enable the bank team to understand how these provisions are allocated. This can be in the form of a Word, PowerPoint or Excel document and should cover, as a minimum, the rules for the bank's allocation of provisions.

2.5 Data manipulation

Before performing checks, the bank team needs to carry out a number of steps to prepare the data for analysis. These include the following.

- Aggregating exposures and collateral values to debtor level.

- Merging different time snapshots of the loan tape to allow analysis through time. This is discussed in more detail below.

2.5.1 Aggregating exposures and security to debtor level

The following fields will need to be created at debtor level (unless specified otherwise) from either facility or collateral tapes for non-retail exposures.

Table 22

List of fields to be aggregated to debtor level for non-retail exposures

New field/new field code	Nature of calculation (field required from facility/collateral view)
Forbearance flag (D_FOR)	Yes/no (Y/N). If any of the facilities of a debtor are considered forborne, all exposures are considered forborne in the case of corporates (FO_INT)
Total value of credit protection (D_VAL)	Group by collateral ID (R_IDCC), averaging the collateral value for each ID (C_VAL). i.e. the collateral value should be the same each time it appears for a given collateral item. Once all unique collateral items have been identified, their values should be summed.
Allocated amount (of credit protection) (D_ALCOLL)	Sum of all collateral entries for a given debtor across the allocated amount field (C_COVER)
On-balance-sheet exposure (D_ONBAL)	Sum of all facilities for a given debtor for the on-balance-sheet exposure (E_ONBAL)
On-balance-sheet exposure (D_OFFBAL)	Sum of all facilities for a given debtor for the off-balance-sheet exposure (E_OFFBAL)
Total exposure per facility (F_EXP) – created at the facility level	On-balance-sheet exposure + (CCR*Off-balance-sheet exposure) (E_ONBAL, E_OFFBAL, E_CCF)
Exposure (D_EXP)	Sum of total exposure per facility (F_EXP) across all facilities of a given debtor
LTV (D_LTV)	Sum of exposure (D_EXP)/Sum of allocated collateral value (D_ALCOLL)
Days past due (D_DAYPD)	Number of days past due calculated for the debtor with the worst past-due status of all exposures in the loan tape At debtor level, the worst case for any facility is taken (D_DPD)
Watch list (D_WATCH)	Yes/no (Y/N). If any of the facilities associated with a debtor have watch list (S_WATCH) = Y, then yes; otherwise no.
Pre-AQR stage 2 share (S_PAS2S)	Sum of total exposures (D_EXP) which have stage (S_Stage) = 2 divided by the sum of total exposures (D_EXP)
Pre-AQR stage 3 share (S_PAS3S)	Sum of total exposures (D_EXP) which have stage (S_Stage) = 3 divided by the sum of total exposures (D_EXP)
Number of stage 3 occurrences (B_N3OC)	Count of facilities associated with debtor which have stage (S_Stage) = 3
Date of last restructure (R_LR)	Maximum (i.e. most recent) number encountered across facilities for date of last restructure (R_LR)
Maximum 12-month PD (PD_MC12)	Maximum number encountered across facilities (PD_C12)
Maximum Lifetime PD (PD_MCL)	Maximum number encountered across facilities (PD_CL)
AQR risk category (AQR_RCAT)	AQR risk category derived from PD_C12M, R_EXTRAT and R_RATAG in line with the instructions provided for sampling, Section 3.5.2.1
Pre-AQR stage 1 provisions (S_PAS1P)	Sum of stage 1 provisions (P_NCI) over all facilities which have stage (S_STAGE) = 1
Pre-AQR stage 2 provisions (S_PAS2P)	Sum of stage 2 provisions (P_NCI) over all facilities which have stage (S_STAGE) = 2
Pre-AQR stage 3 provisions (S_PAS3P)	Sum of stage 3 provisions (P_CI) over all facilities which have stage (S_STAGE) = 3

For retail exposures, the following fields will be created at the facility level.

Table 23

Fields required to be created for retail exposures

New field/new field code	Nature of calculation
Exposure (F_EXP)	On-balance-sheet exposure + (CCR*Off-balance-sheet exposure) (E_ONBAL, E_OFFBAL, E_CCF)
LTV (F_LTV)	Exposure (F_EXP)/allocated amount (C_COVER)
AQR risk category (AQR_RCAT)	AQR risk category derived from PD_C12 in line with the instructions provided for sampling, Section 3.53

2.5.2　Merging different time snapshots

To complete the collective provisioning (described in Section 7) at both facility (retail) and debtor (non-retail) levels, the tapes from each time point must be merged. This should produce a list of unique (combination of facility and debtor) IDs with a flag indicating which exist at each date point. It will also include values of fields as outlined in the tables below at both snapshots, T_{-1} and T_0. The bank team creates a merged tape for each in-scope portfolio. The merged tape follows the same structure as the non-merged tape, i.e. for non-retail it is split into debtor, facility and collateral views, while for retail a single facility view is created. For non-retail exposures, the following information is required at debtor level.

Table 24

Fields required in the merged loan tape for non-retail exposures (debtor tape)

Field name	Description
Portfolio	Portfolio of each debtor as at T_0 (combination of geography (R_GEOGD) and AQR asset segment (S_AQRSD))
Debtor ID	Unique debtor ID (R_IDFD)
Exposure	Exposure of the debtor (D_EXP)
NPE EBA status	NPE status according to EBA definition (S_NPEEBA)
NPE internal	NPE according to the bank's internal definition (S_NPEINT)
NPE in last 12 months	Has debtor been considered NPE in last 12 months according to EBA definition (S_NPE12M)?
Days past due	Days past due of the debtor (D_DAYPD)
Forbearance flag	Flag for the forbearance status of the debtor (D_FOR)
LTV	LTV of the debtor (D_LTV)
AQR risk category (AQR_RCAT)	AQR risk category derived from PD_C12M, R_EXTRAT and R_RATAG in line with the instructions provided for sampling, Section 3.5.3
Debt	Debt for the debtor (B_DEBT)
EBITDA	EBITDA for the debtor (B_EBITDA)
Watch list	Is the debtor considered to be on a watch list (D_WATCH)
Related party	Is the debtor a related party (R_RELATD)

The following fields are required from the facility and collateral views for non-retail exposures in the merged loan tape.

Table 25

Fields required in the merged loan tape for non-retail exposures (facility and collateral view)

Field name	Description
Facility ID	Facility ID of the facility (R_IDFF)
Debtor ID	Debtor ID associated with the facility (R_IDFD)
On-balance-sheet exposure	On-balance-sheet exposure of the facility (E_ONBAL)
Off-balance-sheet exposure	Off-balance-sheet exposure of the facility (E_OFFBAL)
CCF	Credit conversion factor of the facility (E_CCF)
Current interest rate	Current interest rate of the facility (B_CURRAT)
Current contractual maturity	Current maturity of the facility (B_RESMAT)
Collateral ID	Collateral ID of the collateral from the collateral tape (R_IDCC)
Debtor ID	Debtor ID associated with the collateral from the collateral tape (R_IDFD)
Allocated amount of collateral	Allocated amount of the collateral from the collateral tape (C_COVER)
Exposure	Exposure of the facility (F_EXP)

The following fields are required for retail exposures in the merged loan tape.

Table 26

Fields required in the merged loan tape for retail exposures

Field name	Description
Facility ID	Facility ID of the facility (R_IDFF)
Debtor ID	Debtor ID associated with the facility (R_IDFD)
On-balance-sheet exposure	On-balance-sheet exposure of the facility (E_ONBAL)
Off-balance-sheet exposure	Off-balance-sheet exposure of the facility (E_OFFBAL)
CCF	Credit conversion factor of the facility (E_CCF)
LTV	LTV of the facility (F_LTV)
Exposure	Exposure of the facility (F_EXP)
Product type	Product type of the facility (B_PROD)
Channel	Channel through which the facility was sold (B_CHAN) (RRE and retail other only)
Internal rating (where appropriate)	PD according to internal rating (R_INTRAT)
NPE EBA status	NPE status according to EBA definition (S_NPEEBA)
NPE internal	NPE according to the internal definition of the bank (S_NPEINT)
NPE in last 12 months	Has facility been considered NPE in last 12 months according to EBA definition (S_NPE12M)?
Days past due	Days past due of the facility (D_DPD)
Current interest rate	Current interest rate of the facility (B_CURRAT)
Current contractual maturity	Current maturity of the facility (B_RESMAT)
Watch list	Is the facility under observation on a watch list (S_WATCH)
Impairment flag	Is the facility credit-impaired (P_PROVF)
Forbearance flag	Flag for the forbearance status of the debtor (FO_INT)
Loan/income ratio	Loan to income ratio (for RRE only) (E_LIR)
Collateral ID	Collateral ID of the collateral from the collateral tape (R_IDCC)
Allocated amount of collateral	Allocated amount of the collateral from the collateral tape (C_COVER)

Table 27

Merging time snapshots

ID	T$_{-1}$	T$_0$	On-bal expos. (T$_{-1}$)	On-bal expos. (T$_0$)	Off-bal expos. (T$_{-1}$)	Off-bal expos. (T$_0$)	Etc.	
	YES	YES						
	YES	YES						
	YES	YES						
	YES	NO		N/A		N/A		
	NO	YES	N/A		N/A			
	NO	YES	N/A		N/A			
	YES	YES						
	YES	YES						

2.6 DIV analysis

The following subsections set out the approach to analysing the different types of checks, including the required remedial actions before sampling can be finalised. For the avoidance of doubt, DIV checks on data directly sourced from the bank should be performed on the raw data prior to any manipulation as described above. This clearly does not apply where checks require some level of manipulation prior to performing the DIV check.

A template will be provided to ensure responses are delivered in a standardised manner.

The following checks are described below:

- reconciliation checks;

- field-specific checks;

- cross-field checks;

- cross-time checks;

- sense-check on distribution of observations.

2.6.1 Reconciliation checks

Tests to be performed

Once the loan tape has been created, the bank should provide evidence that the loan tape is consistent with the internal system from which it was created. To

facilitate this, a number of reconciliation checks are performed across aggregated totals. As a minimum these must include:

- check on the number of lines in the loan tape;

- total on/off-balance-sheet exposure;

- total performing/non-performing exposure;

- total number of NPEs;

- total forborne exposure;

- total number of forborne exposures;

- total specific and general provisions.

The bank must provide reconciled totals between the source system (i.e. the source system of the loan tape data, not the accounting system) and the loan tape. The subsequent reconciliation check by the bank team must ensure that these reconciliations are fair and accurate. This may involve interviews with the analyst who performed the checks and a "walkthrough" of how the result was achieved, and at least a basic check on the methodology employed to ensure confidence in the result. However, the bank team need not replicate the reconciliation. The bank team must also understand and review the quality checks that the bank has undertaken as part of the loan tape collation.

For loan tapes aggregated from multiple sources, checks should be performed on each source. The field used to calculate the check total for each source should be the booking entity ID (R_ENTITY) (Note: clarification has been provided that if multiple sources are used for the same legal entity a differentiation should be made in this field).

These checks are designed to provide confidence that the loan tape consists of all the exposures of the in-scope portfolio and that there have been no issues with format conversions in the transfer between systems.

In addition, the bank team performs a manual check on ten random records in the loan tape to ensure that they match the source system. Should there be any errors which the bank team considers critical to the continuation of the exercise, the loan tape should be reproduced, to the extent that this does not invalidate the "straight-line" approach to DIV.

Remedial actions

If any transposition errors are observed or suspected, the loan tape should be reproduced, addressing the issues. If this is not possible, appropriate remediation strategies should be applied (as described later in this section).

2.6.2　Field-specific checks

Tests to be performed

The following primarily automated checks are performed across all fields in the loan tape and are a basic validation that the data received are correct and accurate. Field-specific checks should be performed on the raw data provided by the bank, prior to any data manipulation by the bank team.

The minimum field-specific checks to be performed on **continuous fields** are as follows.

- Check that all fields requested in the loan tape are present

- Check for duplications of unique fields:

  - e.g. debtor ID (in debtor tape).

- Check the number of missing (blank) values within a given field, including the check on PD_OL, PD_CL, PD_O12, PD_C12

- Check the number of values in incorrect format, i.e.:

  - text in numeric fields (or vice versa);

  - incorrect units (m vs bn);

  - incorrect N/As;

  - values outside prescribed options.

- Check that values fall within valid ranges:

  - percentages between 0 and 1, in particular for PD data.

- Check there are no negative values for the following fields:

  - EIR (B_INTRAT);

  - current interest rate (B_CURRAT);

  - on-balance-sheet exposure (E_ONBAL);

  - off-balance-sheet exposure (E_OFFBAL);

  - current number of days past due (D_DPD);

  - stage 3 provisioning (P_CI);

  - stage 1 or stage 2 provisioning (P_NCI);

  - credit protection value (C_VAL);

- allocated amount (C_COVER);

- total debt/equity/EBITDA/assets (B_DEBT/B_EQ/B_ASSET/B_EBITDA).

- Check with the bank the validity of top 20/bottom 20 exposure values (E_ONBAL/E_OFFBAL)

- Check that no "default" values have been used; for example, entries with dummy values such as "999999999", "000000000"

- For collateral values (C_VAL, C_COVER), if the highest value in a field is repeated, check the validity of these repetitions with the bank

The minimum field-specific checks to be performed on **discrete fields** are as follows.

- Check that all fields requested in the loan tape are present

- Check the number of missing (blank) values within a given field

- Check the number of values in incorrect format, i.e.:

    - text in numeric fields (or vice versa);

    - incorrect N/As;

    - where optional values are provided, check that one of these has been selected.

The minimum field-specific checks to be performed on **date fields** are as follows.

- Check that all fields requested in the loan tape are present

- Check the number of missing (blank) values within a given field

- Check the number of values in incorrect format i.e. not dd/mm/yyyy

- Check that no dates in date fields are in the future

The minimum field-specific checks to be performed on **identification fields** are as follows.

- Check that all fields requested in the loan tape are present

- Check the number of missing (blank) values within a given field

- Check the number of values in incorrect format

- Identify any duplicates of unique IDs

- Check that no "default" values have been used; for example, entries with dummy values such as "999999999", "000000000"

An assessment of the quality of the data will be made using a Red, Amber, Green (RAG) status for each field and test. The triggers for each RAG classification for field-specific checks are presented in the following table; the triggers and status are also embedded into the DIV template (T2b).

Table 28

RAG triggers for field-specific checks

Status	Trigger
Red	• > 1% of data points erroneous or • Absence of a field required for credit file review in the dataset or • > 1 (top 20/bottom 20) values incorrect
Amber	> 0.1% and ≤ 1% of data points erroneous
Green	≤ 0.1% of data points erroneous

The field-specific checks should be performed quickly (within one week of DIV beginning).

Remedial actions

Given that the field-specific issues can be checked quickly, any issues should be identified sufficiently swiftly to be addressed by the bank. All Amber and Red issues will require a remediation strategy to be put in place. If issues cannot be addressed by the bank, conservative workarounds should be found, e.g. cases of missing or N/A collateral type treated as unsecured, etc. The specific remediation approach will depend on the circumstances and will therefore rely on the bank and the bank team working together to resolve the situation.

NCAs should ensure they are comfortable with the proposed remediation strategy. Remediation strategies for Red and Amber issues will be reported in the DIV template (to be provided before the beginning of Phase 2) and reviewed by the CPMO.

Any issues should be identified and addressed before the sample is selected (although the development of code for sample selection should not wait until the loan tape is finalised).

2.6.3   Cross-field checks

Tests to be performed

There are mutually dependent files within the loan files, i.e. if a field has a specific value (e.g. if the facility's number of days past due is greater than 90), then the related field must also take a specific value (e.g. it must be flagged as NPE according to EBA definition). Checks must be made across such fields to identify

inconsistencies in the loan tape. These checks can be automated and are outlined in detail in the DIV template (T2b). Cross-field checks should be performed on the raw data provided by the bank, prior to any data manipulation by the bank team.

Table 29

Cross-field checks

Cross-field check	Description
AQR status vs NPE definition	The NPE EBA status of the facility/debtor (S_NPEEBA) (performing/non-performing) should match the maximum number of days past due of any facilities (D_DPD) and the individual/collective provisioning of the bank (P_PROVF).
Rating at origination vs staging assessment	If neither external rating **at origination** (either of R_EXTRATO & R_RATAGO missing and R_CREDQO missing) for the debtor nor internal PD at origination (both PD_OL & PD_O12 missing) for a facility are available (empty or N/A), the staging assessment (S_STAGE) for the facility should not be stage 1.
Current rating vs staging assessment	If neither internal/external rating (either of R_EXTRAT or R_RATAGO missing or R_CREDQ missing) nor PD (PD_O12 & PD_C12 missing) for a facility are available (empty or N/A), the staging assessment (S_STAGE) should not be stage 1.
Debtor vs facilities	Does each debtor on the debtor tape have at least one facility on the facilities tape (non-retail only) (using R_IDFD)?
Stage 3 flag vs stage 3 provisions	If the exposure is flagged as stage 3 (S_STAGE = 3) then stage 3 provisions (P_CI) must be greater than 0 for that debtor.
Stage 3 flag vs stage 3 provisions	If a debtor has stage 3 provisions (P_CI) > 0 then it must have exposures flagged as stage 3 (S_STAGE = 3).
NPE definition vs PD_flag	The NPE EBA status (S_NPEEBA) should match the PD definition (PD_C12 or PD_CL).
Collateral type vs location	If a collateral item is flagged as a funded credit protection (C_TYPE = funded type) then the collateral location (C_COUNTR and C_REGION) must be completed. If the collateral is flagged as unfunded (C_TYPE = unfunded type) then the collateral location must not be completed (C_COUNTR and C_REGION).
NPE definition vs staging assessment	The staging assessment should match the NPE EBA status of the exposure, i.e. exposure classified as stage 3: credit-impaired should not be PE,
Staging assessment vs delinquency	The delinquency information should match the staging assessment, i.e. a facility with >= 90 days past due should be stage 3 (S_STAGE=3): credit-impaired.
Impaired flag vs provisions	Staging assessment per facility (S_STAGE) should match the type of provisions allocated (P_CI not 0 and P_NCI = 0 if S_STAGE = 3, and analogously for stage 1/2).
Credit protection value vs allocated amount	The allocated credit protection to a debtor (C_COVER) should be less than or equal to the total value of the credit protection (C_VAL).
Credit protection value vs allocated amount	The total allocated collateral value (C_COVER) (aggregated across debtors using collateral IDs (R_IDCC)) for any collateral linked to more than one debtor should be less than or equal to the collateral value provided for that collateral (C_VAL), i.e. the total amount allocated to debtors from a single collateral item must not be greater than the value of that collateral.
Credit protection value	The credit protection value (C_VAL) should be equal each time it appears for a given collateral item, i.e. for each collateral ID (R_IDCC) the collateral value is the same for each entry in the tape; only the allocated amount is different.

The triggers for RAG statuses for cross-field checks are outlined in **Table 30**.

Table 30

RAG triggers for cross-field checks

Status	Trigger
Red	> 1% of data points erroneous
Amber	> 0.1% and ≤ 1% of data points erroneous
Green	≤ 0.1% of data points erroneous

The cross-field checks should be performed quickly (within one week of DIV beginning).

Remedial actions

Given that the cross-field checks can be performed quickly, any issues should be identified sufficiently swiftly to be addressed by the bank. All Amber and Red issues will require a remediation strategy to be put in place. If issues cannot be addressed by the bank, conservative workarounds should be found, e.g. cases of collateral value < allocated amount imply using the allocated amount as a conservative approach. The specific remediation approach will depend on the circumstances and will therefore rely on the bank and the bank team working together to resolve the situation. Any conservative workarounds/proxies applied should be communicated to the NCA and the CPMO as soon as they occur.

NCAs should ensure they are comfortable with the proposed remediation strategy. Remediation strategies for Red and Amber issues will be reported in the DIV template (to be provided before the beginning of Phase 2) and reviewed by the CPMO.

Any issues should be identified and addressed before the sample is selected (although the development of code for sample select should not wait until the loan tape is finalised).

2.6.4   Cross-time checks

Cross-time checks are performed to ensure the consistency of the dataset that aggregates the two snapshots, T_0 and T_{-1} (described in Section 2.4.7 above). Assessing the evolution of some fields provides information that could not otherwise be checked.

Cross-time checks must be performed after the data tapes have been aggregated and are therefore performed on fields processed by bank teams.

Tests to be performed

Two types of tests are carried out: first, ensuring the combination has worked correctly and there is consistency between the two snapshots; and second, checking that the forborne cases are adequately captured in the loan tape.

Ensuring consistency between the two snapshots:

- If the exposure of the facility (F_EXP) in the previous year is positive and the maturity date (B_RESMAT) is before the T_0 snapshot, then the exposure is not in the T_0 snapshot of the loan tape or the maturity date has been updated as at T_0 (the facility has been refinanced).

- If the facility is > 90 days past due (D_DPD) in the T_{-1} snapshot, then it is flagged as being NPE in the last 12 months (S_NPE12M) in the T_0 snapshot.

- If a debtor has a positive exposure (D_EXP) in previous year but no exposure in current year, all the facilities linked to that debtor in T_{-1} snapshot should not show up in the T_0 snapshot either (and vice versa) – only applicable to non-retail.

Each check should be flagged as follows:

Table 31

RAG triggers for cross-time checks

Status	Trigger
Red	> 0.1% of data points erroneous
Amber	> 0% and ≤ 0.1% of data points erroneous
Green	0% of data points erroneous

The following step should also be carried out to check whether the bank's forbearance flag adequately captures cases of forbearance.

- Identify exposures in financial difficulties. All of the following are considered signs of this:

  - watch list, as at either T_{-1} snapshot or T_0 snapshot (S_WATCH);

  - credit-impaired, as at either T_{-1} snapshot or T_0 snapshot (P_PROVF);

  - past due, as at either T_{-1} snapshot or T_0 snapshot (D_DPD);

  - LTV > 100% (for retail mortgage, CRE, shipping and aviation) as at either T_{-1} snapshot or T_0 snapshot (D_LTV, F_LTV).

- Identify exposures that may have been granted a concession. All the following are considered potential signs of this (for the avoidance of doubt, these would only be considered signs of concession in combination with financial distress):

  - allocated collateral amount T_0 snapshot > allocated collateral amount T_{-1} snapshot (C_COVER);

  - interest rate T_0 snapshot < interest rate T_{-1} snapshot (B_CURRAT);

  - extension of maturity dates between T_{-1} snapshot and T_0 snapshot (B_RESMAT).

- An exposure should be flagged if ALL of the following apply:

  - it is in financial difficulties;

  - it has evidence of being a concession;

  - it is not marked as forborne/restructured as at T_0 snapshot.

The flags for the entire loan tape are then aggregated and assessed by portfolio as follows:

For non-retail exposures, these tests should be carried out at debtor level. For checks that must be completed at facility level – e.g. interest rate T_0 snapshot < interest rate T_{-1} snapshot; allocated collateral amount T_0 snapshot > allocated collateral amount T_{-1} snapshot; and extension of maturity dates – a debtor will be flagged as having failed this test if any of its facilities fail this check.

Table 32

RAG triggers for forbearance validation

Status	Trigger
Red	> 5% flagged
Amber	> 1% flagged
Green	≤ 1% of data points erroneous

Remedial actions

Given that the cross-time checks can be performed quickly, any issues should be identified sufficiently swiftly to be addressed by the bank. All Amber and Red issues will require a remediation strategy to be put in place. Given that the issues could also indicate wider problems, further investigation in conjunction with the bank may be required to ensure data integrity. The specific remediation approach will depend on the circumstances and will therefore rely on the bank and the bank team working together to resolve the situation.

NCAs should ensure that they are comfortable with the remediation strategy proposed. Remediation strategies for Red and Amber issues will be reported in the DIV template (to be provided before the beginning of Phase 2) for review by the CPMO.

Any issues should be identified and addressed before the sample is selected (although the development of code for sample selection should not wait until the loan tape is finalised). If issues with the check of forbearance are found or the internal PD information is considered unreliable, the sample size for stage 1 risk categories should be increased by a factor of 2 (see Section 3.5.7).

2.6.5   Sense-check on distribution of observations

Tests to be performed

A sense-check on distributions is performed on the raw data provided by banks before any manipulation by the bank team. The bank team is required to undertake a qualitative validation of the accuracy of frequency distributions of the following fields:

- collateral type – no excess of "other" collateral types;

- collateral value by collateral type – no excess of collateral value allocated to "other" collateral types;

- segmentation fields – no excess of "other" segmentation;

- retail other – no retail other with exposure > €1,000,000;

- date fields – skews towards particular time periods should be verified with the bank;

- remaining maturity – if there is an excess of a particular value then this must be verified with the bank;

- debtor LTV distribution for retail mortgages and CRE, shipping and aviation – limited exposure in very high and very low LTV buckets;

- average coverage ratio by months past due and product – average coverage ratio increases with months past due for a given product;

- exposure by credit quality step (CQS) and PD bucket – limited exposure in low CQS buckets (unless otherwise expected);

- average CCF for off-balance-sheet exposure by product – in line with expectations given regulatory CCF benchmarks;

- % forborne and NPE – significant proportion of forborne exposure should be NPE;

- debtor/facility level exposure – ensuring there are not unexpectedly large exposures.

Bank teams must assign a good/bad/fair assessment based on their best understanding according to the following descriptions:

- good: expected distribution across possible values;

- fair: some deviation from expected distribution across possible values;

- bad: unexpected excess of a given value, or highly skewed distribution.

This will be a semi-automated check in that, based on the output, the bank team may be required to follow up with the bank to validate unusual results. The field distribution checks are likely to take longer to complete than other checks given the need to review distributions. This may take two to three weeks to complete.

Remedial actions

If distributions are classed as "bad" they should be reviewed with the bank to understand what is driving the unexpected distribution. If a reasonable explanation is provided that does not imply the potential for distortion of the findings then no further

action should be taken. If not, then a remediation strategy should be provided. Examples of the sorts of steps that may be required include:

- obtaining additional information to "break out" other segments and include in reissued loan tape;

- reclassifying exposures that have been included in the wrong segment leading to distortion of results (e.g. second-lien mortgages included with retail mortgages, rather than with retail secured loans);

- bank correcting field-related issues (e.g. correcting NPE definition to include forborne exposures past due as impaired);

- etc.

NCAs should ensure that they are comfortable with the remediation strategy proposed. Remediation strategies for "bad" classifications will be reported in the DIV template (to be provided before the beginning of Phase 2) and reviewed by the CPMO.

Any issues would ideally be identified and addressed before the sample is finalised. If issues are found and addressed after the sample has been selected then the bank team and NCA should assess whether the change would materially impact the validity of the sample. If the issue is found to affect the validity of the sample, the sample should be reselected or additional files sampled from the relevant stratum to ensure an appropriate sample has been selected (depending on the issue).

2.7   Further guidelines on the execution of DIV

The following sections set out further guidelines around the execution of the DIV process. The following are the key objectives behind these guidelines.

- Ensure the DIV process is not open-ended: it should be completed within the time allowed in the work plan, and re-creation of datasets should be minimised as far as possible.

- Put the onus on banks to ensure data are of good quality and easy to manipulate.

- Clarify remediation strategies that might be used by bank teams to address data issues, differentiating by type of field. For this purpose, it is indicated whether the fields are "critical" for the performance of the assessment; where not flagged as critical they must be provided where possible.

The following are covered in the sections below.

- Steps that banks should take in providing the loan tape to ensure as smooth a process as possible

- The approach to dealing with unavailability of data for a particular legal entity

- Options for dealing with a lack of completeness/inaccuracy of specific fields

2.8 Steps that banks should take in providing the loan tape to ensure as smooth a process as possible

For each snapshot date, banks should provide a single loan tape per portfolio (irrespective of the different booking entities contributing to the portfolio). For retail portfolios, the loan tape should consist of a single file, whereas for corporate portfolios, three files will be provided (a debtor view, a facility view and a collateral and guarantees view). The loan tape format must be agreed between the bank and the bank team (typically .csv, plain text, without delimiter). This format must be the same for each of the bank's different loan tapes.

The bank should ensure that the analysts who worked on sourcing and developing the tape are available during the DIV process to answer any questions and to help address any issues that emerge, particularly around transposition checks.

Some fields in the loan tape have been flagged as "where possible" (specifically financial information, e.g. EBITDA or total assets, and external rating). Banks should be strongly encouraged to provide these fields as they are used to reduce the scope of the sampling process – ultimately it is in the bank's interests to provide the field. However, if this is not feasible in the timeline, they may be disregarded.

2.9 Approach to dealing with unavailability of data for a particular legal entity

It may be the case that a bank is not able to deliver the required data for a particular legal entity in a portfolio (a "sub-portfolio") in the time available, or that the entire dataset is of insufficient quality to be usable. In these circumstances, delivery or remediation of data should not be allowed to delay the overall timelines. Three scenarios are possible, each with a different approach to resolution:

Table 33

Solutions for dealing with unavailability of data

Scenario	Solution
The bank can provide no information on the sub-portfolio	Assume misstatement equal to the total reported carrying amount of the sub-portfolio
The bank cannot provide the critical fields but is able to provide a breakdown of the NPE rate and coverage ratio for the portfolio	If critical data are available for some sub-portfolios (covering at least 50% of the exposures in the portfolio), calculate an estimate of the misstatement for the sub-portfolios with missing critical data as the higher of: 50% of the current provisions for the sub-portfolio 2 times the equivalent misstatement for the part of the portfolio with data (adjusted pro rata for exposure, NPE and coverage ratio of the sub-portfolio without critical data) If less than 50% of the portfolio has critical data, then treat the uncovered part of the portfolio as per scenario 1
The bank can only provide the critical fields in the loan tape request	For credit file review: perform sampling on the sub-portfolio, using the available information and following the remediation strategies prescribed For collective provision analysis: perform analysis on reduced segmentation. Consider critically the validity of the bank's collective provisioning methodology given the inability to produce basic data.

2.10 Options for dealing with lack of completeness/accuracy of specific fields

Once the data have been delivered, it is possible that some fields might be incomplete or that DIV might highlight issues with data that make the field partially or entirely unusable. Resolving any issues should begin with the bank, in order to understand:

- has a transposition error occurred that can be fixed by re-transposing or otherwise correcting the loan tape?

- are there alternative sources of data that could be used to meet the required purpose (e.g. provide an alternative product segmentation, provide a proxy for a field – e.g. determining channel from product codes)?

If the bank cannot provide a satisfactory solution in the time available, delays to the schedule must not be permitted. There are a number of critical fields that must be provided (e.g. exposure, debtor ID); if these cannot be provided then the steps described in the previous section should be followed. However, if issues are found with other fields that the bank cannot address, suitably appropriate remediation strategies should be applied. The remediation strategies fall into four main categories:

Table 34

Remediation strategies

Category	Example	Remediation strategy
"Where possible" field is not provided	Debt/EBITDA cannot be calculated	Field cannot be used to reduce scope of sampling
Field used to segment collective provision analysis is not available	"Product segment" not available	Perform collective provision analysis at higher level of segmentation Consider the collective provisioning model of the bank in the light of the fact that it cannot produce some alternative segmentations
Forbearance flag is unavailable or cannot be checked	Remaining contractual maturity unavailable	A conservative proxy for forbearance will be designated by each NCA and submitted to the CPMO for approval along with supporting evidence before sampling is started If such a proxy cannot be found, a conservative adjustment will be applied to the collective provision migration matrix (retail only)
Field is missing or of low quality, where a conservative proxy can be applied	CCF is unavailable	Apply the conservative proxy (e.g. assume 100% CCF)

2.11   Outputs

The key objectives of the DIV process are:

- to ensure that the key data used for sampling and collective provisioning analysis are fit for purpose;

- to highlight any issues with data segmentation at the bank for use in stress testing.

The following output will need to be produced for this workblock:

Table 35

Outputs from DIV

Workblock	Output
2. Loan tape creation and DIV	Complete T2B. DIV monitoring template O2B PowerPoint presentation describing any remedial action the bank should take as a result of DIV

3 Sampling

Files from the in-scope portfolios for Phase 2 are sampled in order to carry out the credit file review. The sampling approach is based on statistical techniques and is compliant with international audit standards. It aims to optimise the feasibility and credibility of the exercise by minimising the sample size, subject to a low sampling error; the error is expected to be less than 5% of total post-adjusted provisions, with a level of assurance of at least 90%. In reality, the potential for overestimating the error will be much lower than this, because of the safeguards introduced in the projection of findings process (anomalies and overrides).

The resulting sample sizes will vary from bank to bank, but will generally fall within the range of around 250 to 450 files per portfolio in scope, although significantly smaller samples may occur in some portfolios. The use of stratification will help to keep the sample size small: as larger and riskier exposures will be oversampled, up to 100% examination, the adjustments will be derived from direct observation in many cases. Otherwise, the projection of findings will be applied to strata of more homogeneous medium-sized and small exposures, in which sample rates are not 100%. The level of scrutiny will be higher for larger, less homogeneous exposures.

Preparation for sampling should begin before the loan tape is finalised. The sample selection should be finalised by the end of week 11. It should be carried out by the bank team, under close supervision by the corresponding NCA and the CPMO through the QA process. The outcomes of the sampling will feed into the credit file review, although the review of "priority debtors" (the largest debtor-level exposures by risk class) should begin even before the sample is finalised.

3.1 Summary of the approach

- Sampling techniques are applied to increase the effectiveness of the credit file review, as is well established in auditing practice[11].

- Sampling is applied to portfolios in scope for the credit file review:

    - only portfolios selected for Phase 2 are sampled;

    - there is no sampling of retail exposures (with the exception of retail mortgages).

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[11] ISA 500, A52: *"(…) The means available to the auditor for selecting items for testing are: (a) selecting all items (100% examination); (b) selecting specific items; and (c) audit sampling. The application of any one or combination of these may be appropriate depending on the particular circumstances, for example, the risks of material misstatement related to the assertion being tested, and the practicality and efficiency of the different means."*

- One sample is selected for each portfolio (e.g. a bank with five portfolios in scope for credit file review will have five samples).

- Based on the internal PD and external PD data, the stage 1 exposures are segmented into consistent AQR risk categories (1-5), which are then used in the subsequent workblocks.

- The sampling process is designed to focus resources on the areas of the portfolio with the greatest uncertainty; insignificant parts of the portfolio are therefore excluded from any sampling (and hence from the projection of findings):

  - sub-segments with strong evidence that any issues are highly unlikely are excluded from the analysis (e.g. AQR risk category 1; debt/EBITDA < 1 and equity/assets > 50%);

  - no sampling of the smallest exposures.

- Once the above exclusions have been made, the remaining portfolio is divided into 56 strata (eight risk buckets and seven exposure buckets), differentiated by size of debtor-level exposure and risk, and a sample is selected from each stratum:

  - exposure buckets are set based on the composition of the bank's portfolios (e.g. the exposure bucketing will be different for an SME and a large corporates portfolio);

  - risk buckets are set using basic risk indicators available to all banks (e.g. internal/external rating, days past due).

- The number of files selected from each stratum is set to target a maximum error of 5% in post-adjustment provisions at a 90% confidence level, assuming a relatively significant (but not extreme) level of adjustment to provisions of around 25% of the original levels and no safeguards to limit potential for overestimation in the projection of findings:

  - the error will be much smaller if the level of adjustment is much smaller than 25%;

  - a number of steps will be taken in the projection of findings process to mitigate the risk of overestimating adjusted provisions, which will reduce the level of error;

  - if the adjustment to provisions is much higher than 25% (e.g. 100%) then the potential for error is greater, although this is deemed appropriate.

- Had a stratified sample not been taken, the required sample size would have been approximately 50% bigger.

- The number of files sampled from each stratum varies depending on a number of criteria:

- portfolio concentration: highly concentrated portfolios such as project finance and shipping have higher sampling rates;

- number of observations in the stratum: the greater the number of observations in a stratum, the greater the size of the sample taken from that stratum;

- riskiness of the stratum: greater scrutiny is placed on non-performing than performing corporate exposures (given the greater uncertainty around provisioning levels); there is greater scrutiny of performing high-risk retail mortgages (given that provision levels for defaulted exposures will be estimated using the collective models);

- adequacy of the forbearance flag: greater scrutiny is placed on banks without an adequate forbearance/restructuring flag;

- adequacy and availability of internal/external PD data: greater scrutiny is placed on banks without adequate PD data.

- A "reserve sample" will also be selected to allow for file replacement in the credit file review and to allow anomalies to be analysed before projection of findings. It is not intended that the reserve sample will be analysed in the credit file review except in extreme circumstances.

- The bank team will select the sample from the bank's loan tape data following DIV (except for the priority group, which can be selected with some confidence prior to the completion of DIV), although preparations to select the sample should run in parallel to the execution of DIV:

  - the CPMO provides a set of templates and example tools;

  - bank teams apply the prescribed rules to set the sample rates per stratum for each portfolio;

  - bank teams submit the populated templates and results to the corresponding NCA and the CPMO;

  - the corresponding NCA and the CPMO verify the appropriateness of the numbers and ensure consistency across banks through cross-comparisons (see Section 10 on QA).

- The NCA should be satisfied that the sample selected is representative of the bank's portfolio, enabling extrapolation to be performed with confidence. If, for instance, a particular legal entity appears materially under-represented in the sample, then the NCA may remedy this while ensuring the selection remains random.

- This approach is consistent with standards on auditing.

The remainder of this section provides:

- the basis for this methodology on the standards of audit;

- the indicative timeline;

- illustrative models, parameter sheets and templates;

- an explanation of how the sample is selected;

- an explanation of how the parameters have been calibrated to minimise the audit error;

- a description of how the results of the sampling selection will be reported.

3.2   Basis in standards on auditing

Standards on auditing from the *International Federation of Accountants* (IFAC), namely *International Standards on Auditing* (ISA), have been taken into account. In particular, the following are relevant considerations, summarised below:

ISA 530, A4

Audit sampling enables the auditor to obtain and evaluate audit evidence about some characteristic of the items selected in order to form or assist in forming a conclusion concerning the population from which the sample is drawn. Audit sampling can be applied using either non-statistical or statistical sampling approaches.

- Auditing a sample is an acceptable technique to draw conclusions about a population

- Both statistical and non-statistical sampling approaches can be applied

ISA 530, A10

The level of sampling risk that the auditor is willing to accept affects the sample size required. The lower the risk the auditor is willing to accept, the greater the sample size will need to be.

- Acceptable level of sampling risk must be defined

- Sample size must be defined in the light of the acceptable sampling risk

ISA 530, A12

With statistical sampling, sample items are selected in a way that each sampling unit has a known probability of being selected. With non-statistical sampling, judgment is used to select sample items. Because the purpose of sampling is to provide a reasonable basis for the auditor to draw conclusions about the population from which the sample is selected, it is important that the auditor selects a representative sample, so that bias is avoided, by choosing sample items which have characteristics typical of the population.

- The sample must be representative and unbiased

- If statistical sampling is applied, this is ensured through the use of random sampling

ISA 530, Appendix 1, Para. 1

Audit efficiency may be improved if the auditor stratifies a population by dividing it into discrete sub-populations which have an identifying characteristic. The objective of stratification is to reduce the variability of items within each stratum and therefore allow sample size to be reduced without increasing sampling risk.

- Stratification may be used to increase the feasibility and credibility ("*improve efficiency*") of the exercise

ISA 530, Appendix 1, Para. 2

When performing tests of details, the population is often stratified by monetary value. This allows greater audit effort to be directed to the larger value items, as these items may contain the greatest potential misstatement in terms of overstatement. Similarly, a population may be stratified according to a particular characteristic that indicates a higher risk of misstatement, for example, when testing the allowance for doubtful accounts in the valuation of accounts receivable, balances may be stratified by age.

- Exposure size and riskiness are often the stratification criteria

Additional standards have been taken into account, in particular:

- ISA 200 – Overall objectives of the independent auditor and the conduct of an audit in accordance with International Standards on Auditing;

- ISA 315 – Identifying and assessing the risks of material misstatement through understanding the entity and its environment;

- ISA 320 – Materiality in planning and performing an audit;

- ISA 330 – The auditor's responses to assessed risks;

- ISA 450 – Evaluation of misstatements identified during the audit;

- ISA 500 – Audit evidence.

3.3 Indicative timeline – bank teams may begin the process before these timelines.

Table 23 below summarises the activities comprising the sampling process, with tentative timeframes. Bank teams may begin the process before these timelines.

Table 36
Indicative timeline for sampling

Task	Indicative date
Preparation of the required scripts and tools based on the rules and examples provided by the CPMO	Week 8
Completion of priority debtor selection	Week 8
Preparation of the in-scope portfolios by: • Excluding from the loan tape the portfolios that have not been selected • Excluding also those assets that will not be reviewed from the in-scope portfolios • Applying the stratification criteria	Week 8
Calculation of sample sizes	Week 8
Completion and submission of interim versions of the templates: • Portfolio sampling profile • Sampling results report • Troubleshooting of issues e.g. unexpectedly large samples	Week 8
Designation of samples randomly selecting debtors	Week 9
QA of the samples selected by bank teams and recommendation of actions	Week 9
Implementation of recommendations from QA&TAT (if any)	Week 11
Review of the adequacy of the selection based on the conclusions from the DIV	Week 11
Completion and submission of final versions of the template	Week 11

3.4 Illustrative models, parameter sheets and templates

The following illustrative models, parameter sheets and templates are relevant to this workblock:

**Table 37**
Illustrative models for sampling

Subject	Illustrative model/parameter sheet
Sampling example tool	Step-by-step example of sample size calculation process and simulation of the findings projection
Sampling rates	Parameter sheet for determining sampling rates, included in the sampling example tool

Table 38

Templates for sampling

Template	Summary of contents	Frequency of submission to CPMO
T3. Sampling rates template	Tool to determine sampling rates for each portfolio stratum	• Interim update two weeks into sampling • Final update two days after completion of DIV

3.5 Approach to selecting the sample

The approach to selecting the sample consists of five steps, as illustrated in the figure below. These steps are not necessarily consecutive, as the bank team may decide, for instance, to prepare all the scripts and tools in advance. The remainder of this subsection describes the approach for each of the steps.

Figure 3

Steps in selecting the sample
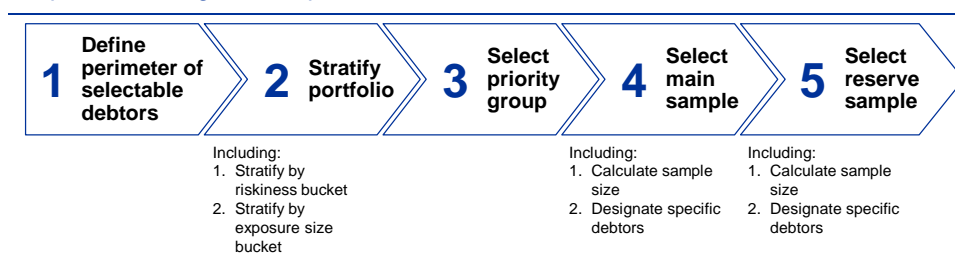
Note: Where a portfolio spans multiple booking entities, a single sample would typically be selected and the results projected across all in-scope booking entities. This requires a representative sample to be chosen that proportionately represents the range of legal entities. NCAs should take this into account when selecting the sample. It is unlikely that the sample will be proportionally representative in each stratum; however, in aggregate the sample should contain a satisfactory mix of exposures across the relevant legal entities. It is important to note, however, that the sample will not reflect the average mix of the respective legal entities given the skewed nature of the sample by size and risk. If the sample is judged not to be representative, the bank team may reselect the sample until it is representative, while maintaining the random nature of the selection.

3.5.1 Step 1 – Define perimeter of selectable debtors

Some parts of each portfolio are excluded from sampling (and therefore projection of findings). The exclusions are:

1. retail exposures other than retail mortgages (i.e. retail SMEs and retail others) – these exposures are reviewed through the collective provisioning review (see Section 7 on the collective provisioning review)[12];

2. portfolios that have not been selected for Phase 2;

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[12] Retail mortgages are also assessed through the collective provisioning review; however critical inputs for the calibration of the collective provisioning parameters are sourced through the review of files and collateral.

3. individual debtors from selected portfolios that are rated externally or internally, where this rating is better than AQR risk category 1, as defined in Section 3.5.3 – the risk of material misstatements is negligible;

4. corporates with both debt/EBITDA < 1 and equity/assets > 50% based on audited accounts that are less than 12 months old;

5. debtors that have been 95% provisioned or more.

Calculation approach

Loan tape data are provided in three different views: the debtor view, facility view and collateral view, as described in Section 2. This subsection outlines how these three views must be combined to prepare the sampling dataset, which is defined at the debtor level and aggregates up past due and LTV. For the avoidance of doubt, each debtor represents one line in the sampling database, except for retail exposures, in which each facility represents one line in the sampling database.

The first task is to prepare the sampling dataset, which contains the fields described in the following table for each debtor (or facility for RRE). As the loan tape for RRE is collected at facility level, "debtor" should be read as "facility" for RRE throughout the description of the sampling process in this section.

Table 39

List of fields of the sampling dataset

Field name	Description
Portfolio	Field S_AQRSD/S_AQRASF (AQR asset segment) and R_GEOGD/R_GEOGF (Geography).
Debtor ID	Field R_IDFD (Debtor internal ID) from the debtor view for non-retail. This field is the unique ID of the dataset, i.e. no duplicate debtor IDs should be contained. For RRE, this should be the concatenation of the facility and debtor IDs (R_IDFF, R_IDFD).
Client connection ID	Field R_INTIDC (Internal ID for the group of connected clients) from the debtor view (non-retail only).
Exposure	Aggregated exposure of the debtor as defined in Section 2.5.1 for non-retail (D_EXP), considering the fields E_ONBAL (On-balance-sheet facility exposure), E_OFFBAL (Off-balance-sheet facility exposure) and E_CCF (Credit conversion factor) from the facility view. For RRE, this is F_EXP.
External rating	Field R_CREDQ (Credit quality step) from the debtor view (non-retail only).
Related party	1 if the field R_RELATD (Identification of whether the debtor is a related party) from the debtor view is YES; 0 if it is NO (non-retail only).
Debt/EBITDA	Ratio between the fields B_DEBT (Total debt) and B_EBITDA (Total EBITDA) from the debtor view (non-retail only).
Equity/assets	Ratio between the fields B_EQ (Total equity) and B_ASSET (Total assets) from the debtor view (non-retail only).
NPE	Field S_NPEEBA (NPE – according to EBA technical guideline EBA/ITS/2013/03/rev1).
Internal NPE	NPE according to internal definition S_NPEINT.
Credit-impaired in the last 12 months	Field S_CI12M (Debtor/facility credit-impaired in the last 12 months).
Days past due	For RRE, field D_DPD (Days past due). For non-retail, calculated for the debtor as the highest instance of filed D_DPD (Days past due) of all exposures (subject to local materiality thresholds).
Watch list provisions	For RRE, field S_WATCH (Watch list). For non-retail, Y if any of the facilities associated with a debtor have field S_WATCH (Watch list) = Y at consolidated level and N if (D_WATCH as defined in Section 2.5.1). Aggregated provisions for the debtor/facility, considering fields Stage 3 (credit-impaired) provisions (P CI) and Stage 1 and 2 (significant increase in credit risk) provisions (P_NCI) as outlined in Section 2.5.1.
Forborne LTV	For RRE, field FO_INT (Forborne – internal definition). For non-retail, Y if any of the facilities associated with a debtor have field S_WATCH (Forborne – internal definition) = Y at a consolidated level and N if it is N (D_FOR as defined in Section 2.5.1) D_LTV or F_LTV as defined in Section 2.5.1).
12-month PD at reporting date	For RRE, field PD_C12 (12-month PD at reporting date). For non-retail, calculated for the debtor as the highest instance of filed PD_C12 (12-month PD at reporting date) of all exposures (subject to local materiality thresholds).
12-month PD at origination	For RRE, field PD_O12 (12-month PD at origination). For non-retail, calculated for the debtor as the highest instance of filed PD_O12 (12-month PD at origination) of all exposures (subject to local materiality thresholds).
Lifetime PD at reporting date	For RRE, field PD_CL (Lifetime PD at reporting date). For non-retail, calculated for the debtor as the highest instance of filed PD_CL (Lifetime PD at reporting date) of all exposures (subject to local materiality thresholds).
Lifetime PD at origination	For RRE, field PD_OL (Lifetime PD at origination). For non-retail, calculated for the debtor as the highest instance of filed PD_CL (Lifetime PD at origination) of all exposures (subject to local materiality thresholds).
Stage	For RRE, S_STAGE (Stage). For non-retail, calculated as following: if B_N3OC (Number of stage 3 occurrences) > 0, stage should be 3. If S_PAS2S ≥ 50% stage should be 2; otherwise stage should be 1.

The third step is to exclude from the collated dataset the portfolios and debtors that are not subject to the credit file review:

- portfolio is not among those selected during Phase 1;

- portfolio = retail SME;

- portfolio = other retail;

- AQR risk category 1;

- both debt/EBITDA < 1 and equity/assets > 50%;

- provisions > 95% of debtor exposure.

The general conventions about how to treat missing values apply to this dataset: "not applicable" is designated as "N/A" for text and "11111111111" for numeric fields; "missing information" is designated as "MISS" for text and "99999999999" for numeric fields.

3.5.2   Step 2 – Stratify portfolio

Each portfolio is split into strata. This stratification ensures a manageable sample size, while maintaining high standards of accuracy and representativeness of the sample. Stratification is based on the criteria of exposure size and riskiness. **Table 40** below illustrates how each portfolio is divided into strata and how the stratified sample is selected. Matrix numbers represent the percentage of observations selected from each bucket, from an example large corporate portfolio.

Table 40
Illustrative example of how the stratified sample is arrived at for each portfolio

Riskiness bucket	5th pctl.	Bucket 1	Bucket 2	Bucket 3	Bucket 4	Bucket 5	Top10/top8
Default > 12m	0%	7.55%	50%	83%	100%	100%	100%
Default > 6m	0%	20.59%	71%	100%	100%	100%	100%
Default < 6m	0%	16.28%	50%	71%	100%	100%	100%
Significant risk	0%	10.00%	25%	57%	100%	0%	100%
Stage 1 "High risk"	0%	11.63%	42%	100%	100%	100%	100%
Stage 1 "Medium risk"	0%	11.63%	42%	100%	100%	100%	100%
Stage 1 "Low risk"	0%	61.54%	89%	100%	100%	100%	100%
Stage 1 "Very low risk"	0%	1.15%	13%	20%	37%	100%	100%

3.5.3　Step 2.1 – Stratify by riskiness bucket

Riskiness buckets (vertical axis of **Table 40** above) are defined using basic definitions that all banks should be able to provide in their loan tape (see Section 2). In addition, stage 1 exposures are stratified along consistent AQR risk categories, based on internal and external ratings provided in the loan tape. These AQR risk categories will subsequently be used in the credit file review, projection of findings and collective provisions workblocks. A greater focus is given to risk levels with greater likelihood of misclassification. The AQR risk categories are derived from existing rating information, as described below. Where both internal and external ratings are available, the more conservative risk category must be assigned.

Table 41

Determination of AQR risk categories

External rating as of loan tape			AQR risk category		12m PD as per internal rating
S&P/Fitch	**Moody's**				
BBB- or better	Baa3 or better		1		<0.5%
BB+	Ba1		2		0.5%-1.0%
BB	Ba2		3		1.0%-2.5%
BB-	Ba3		4		2.5%-7.5%
B+ or worse	B1 or worse		5		≥7.5%

Sampling distinguishes between stage 1, 2 and 3 exposures for further stratification, in order to allow more homogeneous risk strata in terms of expected misstatement. AQR risk category 1, which is the least risky, is excluded from further sampling, while the other AQR risk categories are subject to sampling. The calibration of AQR risk category 1 (PD threshold) may be adjusted in cases where very material parts of the portfolio would be excluded from further sampling based on the above calibration.

Table 42

Stratification according to the impairment stage

AQR risk category	Common risk stratum for sampling
1	*Excluded from sampling*
2	Stage 1: Very low risk
3	Stage 1: Low risk
4	Stage 1: Medium risk
5	Stage 1: High risk

Stage 3 exposures are further distinguished based on the time in default data (D_DPD) included in the loan tape. The specific risk stratification definitions are:

- *Stage 3 – Default more than 12 months*: is and has been non-performing with days past due for more than 12 months (internal or EBA definition);

- *Stage 3 – Default more than six months but less than 12 months*: is and has been non-performing with days past due of more than six months but less than 12 months (internal or EBA definition);

- *Stage 3 – Default less than six months:* is and has been non-performing with days past due of less than six months (internal or EBA definition);

- *Significant risk: debtors with S_Stage=2;*

- *Stage 1 "High risk":* has not been non-performing for the last 12 months, but currently exhibits one of the signs of potential deterioration defined in **Table 44**;

- *Stage 1 "Medium risk":* currently has none of the high-risk signs, but has been non-performing less than 12 months ago (internal or EBA definition);

- *Stage 1 "Low risk":* currently has none of the high-risk signs, and has not been non-performing for at least the last 12 months;

- *Stage 1 "Very low risk".*

Data required

The basis for the stratification is the sampling dataset, as detailed in the section above. The fields required are listed in the table below.

Table 43

List of fields from the sampling dataset required for stratifying by riskiness

Field name	Description	Variable name
Portfolio	Portfolio of each debtor/facility (combination of geography (R_GEOGD) and AQR asset segment (S_AQRSD))	R_GEOGD and S_AQRSD
Debtor ID	Unique debtor ID (non-retail), concatenation of facility and debtor IDs for RRE	R_IDFD
NPE in the last 12 months	Flag indicating whether the debtor (facility for RRE) has been non-performing in the last 12 months	S_NPE12M
Internal NPE	Status according to the bank's internal definition (to derive cure status)	S_NPEINT
Days past due	Maximum number of days past due for the debtor (facility for RRE)	D_DPD
Watch list	Flag indicating whether the debtor (facility for RRE) is on the bank's watch list	S_WATCH
Forborne	Flag indicating whether the debtor (facility for RRE) is forborne	FO_INT
PD at reporting date	Risk of a default occurring on the financial instrument as at the reporting date	PD_C12
PD at origination[2]	Risk of a default occurring on the financial instrument as at the date of initial recognition	PD_O12
External credit rating	External rating of the debtor according to the long-term credit rating assessment	R_EXTRAT and R_RATAG
AQR risk category	AQR risk category derived from PD_C12, R_EXTRAT and R_RATAG in line with the instructions provided in the loan tape section	AQR_RCAT
Stage	IFRS 9 staging allocation for facility, for debtor	S_Stage (retail) or S_PAS2S and S_PAS3S and B_N3OC (non-retail)

Parameters required

Riskiness buckets are defined through the combination of three flags – stage, AQR risk category and PD – together with external rating information and time in default.

Table 44

Definition of stratification variables

Bucket type	Risk classification	Conditions	
Default buckets	Default	• NPE = NP • OR Internal NPE = NP • OR S_STAGE=3	
	For these also to be specified:		
	Default >12m	• Months past due > 12	
	Default >6m	• Months past due ≤ 12 • AND Months past due > 6	
	Default <6m	• Months past due ≤ 6	
Non-default buckets	Significant risk (Stage 2 and significant risk within Stage 1)	• NPE = PE • AND Internal NPE = PE • AND S_STAGE=2	OR • NPE = PE • AND Internal NPE = PE • AND S_STAGE=1 • AND PD_C12 > 0.2%* • AND any of the following: - Days past due > 30* - Forborne=yes - RestructuredT0=yes - Watchlist=yes - PD_C12 > 20%* - (PD_C12 / PD_O12) − 1 > 200%*
	Stage 1	• NPE = PE • AND Internal NPE = PE • AND StageT0=1	
	For these also to be specified:		
	Stage 1 "High risk"	• AQR Risk category=5	
	Stage 1 "Medium Risk"	• AQR Risk category=4	
	Stage 1 „Low risk"	• AQR Risk category=3	
	Stage 1 „Very low risk"	• AQR Risk category=2	

3.5.4   Step 2.2 – Stratify by exposure size buckets

Exposure size buckets (horizontal axis of **Table 40** above) are defined in three steps:

- the top eight/ten[13] debtors by exposure size of each portfolio and risk bucket are sampled;

- the smallest exposures (i.e. below the 5th percentile[14]) are excluded from the analysis on the basis of the immateriality of the potential adjustment;

- the range between the eighth/tenth debtor by exposure size and the 5th percentile (based on total number of debtors, ranked by exposure size) is split into five buckets of the same absolute difference in exposure.

Data required

The basis for the stratification is the sampling dataset, as detailed in the sections above. The fields required are listed in the table below.

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[13]   For non-retail portfolios, the number of debtors that are sampled as the largest by debtor exposure is reduced to eight from the previous ten. The top ten debtors by exposure size continue to be used for residential real estate exposures.

[14]   5% smallest exposures (based on total number of debtors in the portfolio) ordered by exposure size.

Table 45

List of fields from the sampling dataset required to stratify by exposure size

Field name	Description
Portfolio	Portfolio of each debtor (facility for RRE)
Debtor ID	Unique debtor ID (concatenation of facility and debtor ID for RRE)
Exposure	Aggregated exposure of all loans of the same debtor (exposure per facility for RRE)
Riskiness bucket	Riskiness bucket as defined in the section above: • Default more than 12 months • Default less than 12 months • Default less than 6 months • Significant risk • Stage 1 "High risk" • Stage 1 "Medium risk" • Stage 1 "Low risk" • Stage 1 "Very low risk"

Parameters required

It is helpful to clarify some definitions.

- A stratum is a sub-segment of the portfolio with similar exposure size and risk classification – i.e. "normal risk, exposure size bucket 1" would be an example of a stratum

- Strata is the plural of stratum

- A common risk stratum is a group of strata with different levels of exposures but the same risk characteristics – e.g. "normal risk, exposure size bucket 1" and "normal risk, exposure size bucket 2" would be in a common risk stratum

- A common exposure stratum is a group of sub-segments with different levels of risk but the same exposure characteristics – i.e. "normal risk, exposure size bucket 1" and "normal cure risk, exposure size bucket 1" would be in a common exposure stratum

Exposure size buckets are defined by comparing the *exposure* for each debtor with a number of exposure cut-off points:

- 5th percentile;

- Cut-off$_1$;

- Cut-off$_2$;

- Cut-off$_3$;

- Cut-off$_4$;

- Top eighth/tenth exposure.

These cut-offs are specific to each portfolio and riskiness bucket, meaning that, for instance, the cut-off points for "retail mortgages normal" will be different from those for "retail mortgages defaulted > 12 months" and "large corporates defaulted > 12 months". The steps to calculate them are explained below and illustrated in Figure 6:

1. calculate the 5th percentile of exposure (by debtor) for each portfolio and riskiness bucket, i.e. determine the exposure of the debtor which has an exposure smaller than 95% of the other debtors in the same common risk stratum;

2. identify the exposure size of the top eight/tenth debtor by exposure size in each common risk stratum;

3. calculate the auxiliary variable "step" as:

4. $\text{Step} = \dfrac{\text{Top 10th exposure - 5th percentile}}{5}$

5. for i = 1 to 4, calculate Cut-off$_i$ as: *Cut-off$_i$ = 5th percentile + (Step xi)*

Table 46

Cut-off points used for stratification of an example large corporate portfolio (by bucket)

(Aggregated exposure per stratum)

Riskiness bucket	5th pctl.	Bucket 1	Bucket 2	Bucket 3	Bucket 4	Bucket 5	Top10/top8
Default > 12m	19,000	11,470,000	4,959,000	4,764,000	1,108,000	1,989,000	19,660,000
Default > 6m	8,000	2,038,000	1,562,000	1,534,000	550,000	728,000	18,258,000
Default < 6m	4,000	2,390,000	2,360,000	2,904,000	560,000	820,000	15,404,000
Significant risk	6,000	2,862,000	3,710,000	2,872,000	2,350,000	-	26,126,000
Stage 1 "High risk"	3,000	2,711,000	3,357,000	1,557,000	2,062,000	1,701,000	10,545,000
Stage 1 "Medium risk"	3,000	2,711,000	3,357,000	1,557,000	2,062,000	1,701,000	10,545,000
Stage 1 "Low risk"	100,000	1,200,000	1,900,000	700,000	400,000	1,100,000	24,300,000
Stage 1 "Very low risk"	8,000	865,600,000	48,640,000	54,800,000	43,920,000	12,800,000	163,520,000

Calculation approach

Once the parameters are calculated, each debtor is allocated to the corresponding exposure size bucket:

*   Exposure size bucket = Top 8/10 when Top 8th/10th exposure ≤ exposure;

*   Exposure size bucket = 5 when Cut-off$_4$ ≤ exposure < Top 10th exposure;

*   Exposure size bucket = 4 when Cut-off$_3$ ≤ exposure < Cut-off$_4$;

*   …

- Exposure size bucket = 1 when 5th percentile < exposure < Cut-off$_1$;

- Exposure size bucket = 5th percentile when exposure ≤ 5th percentile;

Table 47

Number of debtors allocated to each stratum of an example large corporate portfolio

(Number of borrowers within each stratum)

Riskiness bucket	5th pctl.	Bucket 1	Bucket 2	Bucket 3	Bucket 4	Bucket 5	Top10/top8
Default > 12m	7	106	12	6	1	2	8
Default > 6m	3	34	7	4	1	1	8
Default < 6m	4	43	10	7	1	1	8
Significant risk	5	50	16	7	4	-	8
Stage 1 "High risk"	7	86	24	7	6	4	8
Stage 1 "Medium risk"	7	86	24	7	6	4	8
Stage 1 "Low risk"	2	13	9	2	1	2	8
Stage 1 "Very low risk"	225	1,041	75	51	27	6	8

3.5.5   Step 3 – Select the priority debtors

The "priority debtors" are selected in advance of the start of the credit file review. These are the top eight/ten debtors (top five for small, granular non-retail portfolios) by exposure size per portfolio and riskiness bucket. Picking these files should be relatively straightforward, allowing the credit file review to begin swiftly on completion of the loan tape. If the eighth and ninth debtors are strictly identical by exposure, then the lower allocated value of collateral can be used to select which debtor goes into the priority debtors. If the allocated collateral is equal then a random choice should be made.

Data required

The basis for the selection of the priority debtors is the sampling dataset, as detailed in the sections above. The fields required are listed in the table below.

Table 48

List of fields from the sampling dataset required to select the priority debtors

Field name	Description
Portfolio	Portfolio of each debtor
Debtor ID	Unique debtor ID (concatenation of facility and debtor ID for RRE)
Exposure	Aggregated exposure of all loans of the same debtor (facility)
Riskiness bucket	Riskiness bucket as defined in the section above • Default more than 12 months • Default less than 12 months • Default less than 6 months • Significant risk • Stage 1 "High risk" • Stage 1 "Medium risk" • Stage 1 "Low risk" • Stage 1 "Very low risk"
Exposure size bucket	Exposure size bucket as defined in the section above • 5th percentile • Bucket 1 • Bucket 2 • Bucket 3 • Bucket 4 • Bucket 5 • Top 8/10

Calculation approach

The selection of the priority debtors simply involves picking the debtors that have been allocated to the top eight/ten exposure size bucket for all the portfolios and riskiness buckets. For the avoidance of doubt, this means that at least 64 (for non-retail exposures) and 80 debtors (for retail exposures) will be selected per portfolio, although some debtors may belong to the same group of connected clients and must therefore be analysed together. No extra priority debtors should be selected in such cases.

3.5.6 Step 4 – Select random stratified sample

The stratification of the portfolios enables sufficient audit evidence to be gathered with only a few observations per stratum. This section outlines how the number of observations per stratum is defined and how individual debtors are picked once the sample size has been calculated.

3.5.7 Step 4.1 – Calculate sample size

Not all strata will be sampled. In general, small exposures will not be reviewed and in the case of retail mortgage portfolios, for those debtors that do not show any

evidence of current or past reasons for potential impairment, only the largest exposures will be reviewed. This is illustrated in **Table 49** and **Table 50** below.

Table 49

Strata subject to scrutiny for non-retail portfolios

(Strata subject to scrutiny for non-retail portfolios)

Riskiness bucket	5th pctl.	Bucket 1	Bucket 2	Bucket 3	Bucket 4	Bucket 5	Top10/top8
Default > 12m	NO	YES	YES	YES	YES	YES	YES
Default > 6m	NO	YES	YES	YES	YES	YES	YES
Default < 6m	NO	YES	YES	YES	YES	YES	YES
Significant risk	NO	YES	YES	YES	YES	YES	YES
Stage 1 "High risk"	NO	YES	YES	YES	YES	YES	YES
Stage 1 "Medium risk"	NO	YES	YES	YES	YES	YES	YES
Stage 1 "Low risk"	NO	YES	YES	YES	YES	YES	YES
Stage 1 "Very low risk"	NO	YES	YES	YES	YES	YES	YES

Table 50

Strata subject to scrutiny for RRE portfolios

(Strata subject to scrutiny for residential real estate portfolios)

Riskiness bucket	5th pctl.	Bucket 1	Bucket 2	Bucket 3	Bucket 4	Bucket 5	Top10/top8
Default > 12m	NO	YES	YES	YES	YES	YES	YES
Default > 6m	NO	YES	YES	YES	YES	YES	YES
Default < 6m	NO	YES	YES	YES	YES	YES	YES
Significant risk	NO	YES	YES	YES	YES	YES	YES
Stage 1 "High risk"	NO	YES	YES	YES	YES	YES	YES
Stage 1 "Medium risk"	NO	YES	YES	YES	YES	YES	YES
Stage 1 "Low risk"	NO	YES	YES	YES	YES	YES	YES
Stage 1 "Very low risk"	NO	NO	NO	NO	NO	NO	NO

The number of files sampled per stratum is defined based on the following factors (see more details in Table 32):

- the risk category of the stratum;

- the AQR asset segment (RRE vs non-retail);

- whether or not the portfolio is granular (i.e. has more than 1,000 individual debtors);

- the size of the portfolio;

- the number of debtors in the stratum.

Data required

The basis for the calculation of the sample size is the sampling dataset, as detailed in the sections above. The fields required are listed in the table below.

Table 51

List of fields from the sampling dataset required to calculating the sample size

Field name	Description
Portfolio	Portfolio of each debtor (facility for RRE)
Debtor ID	Unique debtor ID (concatenation of facility and debtor ID for RRE)
Exposure	Aggregated exposure of all loans of the same debtor (exposure of the facility for RRE)
Riskiness bucket	Riskiness bucket as defined in the section above • Default more than 12 months • Default less than 12 months • Default less than 6 months • Significant risk • Stage 1 "High risk" • Stage 1 "Medium risk" • Stage 1 "Low risk" • Stage 1 "Very low risk"
Exposure size bucket	Exposure size bucket as defined in the section above • 5th percentile • Bucket 1 • Bucket 2 • Bucket 3 • Bucket 4 • Bucket 5 • Top10

Parameters required

The parameters required to determine the statistical sufficiency of the sample are provided by the CPMO. The parameters are shown in the table below.

Table 52

Statistical sufficiency parameters table provided by the CPMO

Number of obs in stratum	Stage 1 "Very low risk"'	Retail mortgage		Small, concentrated non-retail		Non-retail granular (more than 1,000 debtors)		Non-retail non-granular (fewer than 1,000 debtors)	
		Other "Not NPE"	NPE	Not NPE	NPE	Not NPE	NPE	Not NPE	NPE
1	0	1	1	1	1	1	1	1	1
2	0	2	2	2	2	2	2	2	2
3	0	3	3	3	3	3	3	3	3
4	0	4	4	4	4	4	4	4	4
5	0	5	4	4	4	4	5	4	5
6	0	5	5	4	4	4	5	4	5
7	0	6	5	4	4	4	5	4	5
8	0	7	5	4	4	4	5	4	5
9	0	8	5	4	4	4	5	4	5
10	0	8	5	4	4	4	5	4	6
11	0	9	5	4	4	4	6	5	6
12	0	10	5	4	4	4	6	5	7
13	0	10	5	4	4	4	6	5	8
14	0	11	5	4	4	4	6	5	8
15	0	12	5	4	4	4	6	5	9
16	0	12	5	4	4	4	6	6	10
17	0	13	5	4	4	4	6	7	10
18-62	0	13	5	4	4	5	7	7	12
63-83	0	13	5	4	4	5	8	8	13
84-120	0	13	5	4	4	5	8	8	14
121-200	0	13	5	4	4	5	8	8	15
201+	0	13	5	4	4	6	8	8	18

Bank teams may apply the parameters for small concentrated non-retail portfolios when the total risk-weighted assets (RWAs) of the portfolio are less than 5% of the bank's total credit RWAs and the top 50 debtors account for at least 40% of the total exposure in the portfolio. Bank teams may petition to apply the parameters where the portfolio's total RWAs are between 5% and 10% of the bank's total credit RWAs and the top 50 debtors account for at least 40% of the total exposure in the portfolio, if the number of files selected for the bank is greater than the expected number of files communicated by the CPMO at the end of Phase 1. The following subsection explains how these parameters are applied.

Calculation approach

The first step in the calculation is to allocate the exposure and number of debtors (after exclusions) per stratum, as illustrated in the following table.

Table 53

Summary tables of number of debtors and aggregated exposure per stratum for an example large corporate portfolio (with exclusions e.g. AQR risk category 1 removed)

(Number of borrowers within each stratum)

Riskiness bucket	5th pctl.	Bucket 1	Bucket 2	Bucket 3	Bucket 4	Bucket 5	Top10/top8
Default > 12m	7	106	12	6	1	2	8
Default > 6m	3	34	7	4	1	1	8
Default < 6m	4	43	10	7	1	1	8
Significant risk	5	50	16	7	4	-	8
Stage 1 "High risk"	7	86	24	7	6	4	8
Stage 1 "Medium risk"	7	86	24	7	6	4	8
Stage 1 "Low risk"	2	13	9	2	1	2	8
Stage 1 "Very low risk"	225	1,041	75	51	27	6	8

(Aggregated exposure per stratum)

Riskiness bucket	5th pctl.	Bucket 1	Bucket 2	Bucket 3	Bucket 4	Bucket 5	Top10/top8
Default > 12m	19,000	11,470,000	4,959,000	4,764,000	1,108,000	1,989,000	19,660,000
Default > 6m	8,000	2,038,000	1,562,000	1,534,000	550,000	728,000	18,258,000
Default < 6m	4,000	2,390,000	2,360,000	2,904,000	560,000	820,000	15,404,000
Significant risk	6,000	2,862,000	3,710,000	2,872,000	2,350,000	-	26,126,000
Stage 1 "High risk"	3,000	2,711,000	3,357,000	1,557,000	2,062,000	1,701,000	10,545,000
Stage 1 "Medium risk"	3,000	2,711,000	3,357,000	1,557,000	2,062,000	1,701,000	10,545,000
Stage 1 "Low risk"	100,000	1,200,000	1,900,000	700,000	400,000	1,100,000	24,300,000
Stage 1 "Very low risk"	8,000	865,600,000	48,640,000	54,800,000	43,920,000	12,800,000	163,520,000

The number of observations is then looked up for each stratum in Table 52 above. In doing so, the correct set of corporate parameters (granular, non-granular or small and granular) should be used, to arrive at the number of observations in the portfolio **after exclusions**.

Table 54

Sample size per stratum for an example large corporate portfolio

(Sample size per stratum (expressed in number of borrowers))

	5th pctl.	Bucket 1	Bucket 2	Bucket 3	Bucket 4	Bucket 5	Top10/top8
Default > 12m	-	8	6	5	1	2	8
Default > 6m	-	7	5	4	1	1	8
Default < 6m	-	7	5	5	1	1	8
Significant risk	-	5	4	4	4	-	8
Stage 1 "High risk"	-	5	5	4	4	4	8
Stage 1 "Medium risk"	-	5	5	4	4	4	8
Stage 1 "Low risk"	-	4	4	2	1	2	8
Stage 1 "Very low risk"	-	6	5	5	5	4	8

The required number of sampled debtors is calculated based on the statistical parameters provided in Table 32, which is also embedded into the T3 sampling template. If forbearance information is not available to determine the high-risk segment and no conservative proxy is available (as described in the DIV section), or if the internal PD information is considered unreliable, the sample size for stage 1 risk strata should be increased by a factor of 2 (up to the total population of the stratum). Confidence levels and expected sampling error will be revised based on findings throughout the exercise, which may require the sample size to be increased further, e.g. via the reserve sample. For instance, if forbearance/PD information is not available/reliable for the above example, the revised sample size will be:

Table 55

Sample size per stratum for an example large corporate portfolio when forbearance information is not available

(Sample size per stratum (expressed in number of borrowers)

	5th pctl.	Bucket 1	Bucket 2	Bucket 3	Bucket 4	Bucket 5	Top10/top8
Default > 12m	-	8	6	5	1	2	8
Default > 6m	-	7	5	4	1	1	8
Default < 6m	-	7	5	5	1	1	8
Significant risk	-	5	4	4	4	-	8
Stage 1 "High risk"	-	10	10	7	6	4	8
Stage 1 "Medium risk"	-	10	10	7	6	4	8
Stage 1 "Low risk"	-	8	8	2	1	2	8
Stage 1 "Very low risk"	-	12	10	10	10	6	8

Example calculation

An example calculation and output are shown in Excel "Sampling example tool.xlsx".

3.5.8 Step 4.2 – Select specific debtors

To ensure that the sample is representative and unbiased, random sampling is applied to select specific debtors.

Data required

The basis for the selection of specific debtors is the sampling dataset, as described in the sections above. The fields required are listed in the table below.

Table 56

List of fields from the sampling dataset required to designate specific debtors for the sample

Field name	Description
Portfolio	Portfolio of each debtor (facility for RRE)
Debtor ID	Unique debtor ID (concatenation of facility and debtor ID for RRE)
Exposure	Aggregated exposure to the debtor (exposure of the facility for RRE)
Riskiness bucket	Riskiness bucket as defined in the section above • Default more than 12 months • Default less than 12 months • Default less than 6 months • Significant risk • Stage 1 "High risk" • Stage 1 "Medium risk" • Stage 1 "Low risk" • Stage 1 "Very low risk"
Exposure size bucket	Exposure size bucket as defined in the section above • 5th percentile • Bucket 1 • Bucket 2 • Bucket 3 • Bucket 4 • Bucket 5 • Top 10

Calculation approach

The approach to selecting specific debtors is:

1. ensure that the portfolio follows a random order by assigning a randomly generated number[15] (e.g. SAS ranuni(seed)) to each debtor and sorting in descending order;

2. starting with the first debtor in the randomly sorted list, select the first "n" debtors for each stratum, where "n" is the total sample size for each stratum described in the previous section.

Alternatively, commonly used data management software offers solutions to run stratified samples easily (e.g. SAS PROC SURVEYSELECT combined with the statement "strata"). The bank team may use these solutions if the randomness of the selection is ensured.

Experience suggests that some parties can struggle to select samples randomly. Therefore, following selection of the sample, the party responsible for selecting the sample should sign a declaration that appropriate measures have been taken to

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[15] ISA 530, Appendix 4, Paragraph a: *"Random selection (applied through random number generators, for example, random number tables)."*

ensure that the sample is random, and the NCA should ensure that the sample selection process has been quality-assured.

If the pre-sampling reclassification due to AQR backstop triggers has affected material parts of the exposure within an AQR risk category, statistics should be kept on the pre-sampling reclassifications of facilities/debtors to stage 2. These will facilitate QA and the assessment of requirements for overrides during the extrapolation of the findings workblock and the interface with collective provisioning. The bank team should therefore, as a minimum, calculate the following and provide them to the CPMO upon request for each AQR risk category:

- *pre-AQR shares of stage 2 and stage 3 facilities/debtors (number and exposure-based);*

- *post-backstop shares of stage 2 and stage 3 facilities/debtors (number and exposure-based, after application of non-rebutted backstops for stage 2 allocation).*

For the "significant risk" common risk stratum, the requirements are:

- *post-backstop share of (pre-AQR) stage 1 facilities/debtors;*

- *post-backstop share of (pre-AQR) stage 1 facilities/debtors within the sampled facilities/debtors.*

Particularly in cases where the latter two are materially different, the bank team should consider augmenting the sample with reserve debtors as early as the credit file review stage, in order to increase representativeness. Extreme cases should be discussed with the CPMO at an early stage in the process to avoid affecting timelines.

3.5.9 Step 5 – Select the reserve sample

Alongside the main sample, the bank team selects a reserve sample. Its purpose is to allow files to be replaced under very precise circumstances, as explained in Section 4.4 and Section 6, and to check anomalies in the projection of findings phase. This section outlines how the reserve sample is selected while preserving all the attributes defined for the main sample, such as representativeness, non-bias, sufficiency, etc.

3.5.10 Step 5.1 – Calculate the sample size for the reserve sample

The calculation of the reserve sample size is a parallel step to the calculation of the main sample size. The data required are the same as for the main sample, and the reserve sample is calculated immediately after the main sample size has been calculated.

Calculation approach

The reserve sample, when combined with the actual sample, can never be more than the total number of debtors in the stratum. Given "N" debtors per stratum and a main sample size of "n*", the reserve sample size is calculated using the following expression:

$R = min(n^*, N – n^*)$

Table 57 below illustrates the reserve sample size for the example of a large corporate portfolio.

Table 57

Reserve sample for an example large corporate portfolio

	5th pctl.	Bucket 1	Bucket 2	Bucket 3	Bucket 4	Bucket 5	Top10/top8
Default > 12m	-	8	6	1	-	-	-
Default > 6m	-	7	2	-	-	-	-
Default < 6m	-	7	5	2	-	-	-
Significant risk	-	5	4	3	-	-	-
Stage 1 "High risk"	-	5	5	3	2	-	-
Stage 1 "Medium risk"	-	5	5	3	2	-	-
Stage 1 "Low risk"	-	4	4	-	-	-	-
Stage 1 "Very low risk"	-	6	5	5	5	2	-

3.5.11   Step 5.2 – Designate specific debtors for the reserve sample

The selection of the specific reserve sample debtors is carried out after the selection of the main sample. The required dataset is therefore the same, excluding those files that have been already selected, and the approach is also the same as described above.

3.6   Tolerance for audit error and calibration of parameters

This section outlines the target confidence level with which the applicable parameters were calibrated and provides a demonstration of their fitness for purpose. This demonstration is in reality an Excel tool that can be adjusted to test the confidence level for different portfolios and under different hypotheses of the severity of the adjustments resulting from the audit process. Bank teams can test different cases to familiarise themselves with the concepts behind the methodology.

3.6.1 Illustration of the target sampling error (5% error bound with 90% confidence level)

Audit risks[16] should be minimised during any audit exercise. In the AQR, non-sampling risk is minimised through bank teams' adherence to the highest professional standards. Sampling risk has been mitigated by performing Monte Carlo simulations of potential credit file review outcomes under reasonable assumptions around severe, but not extreme, findings to determine appropriate sample sizes by stratum.

Sample sizes have been calibrated to ensure with 90% confidence a sampling error at portfolio level that is 5% or less of the post-adjustment provisions if findings are extrapolated linearly across strata. In fact, this "blind" projection of findings will not be performed and therefore the actual error at a portfolio level post projection of findings should be lower – particularly in terms of overestimation of post-adjustment provisions; this is described further in Section 6 on the projection of findings of the credit file review. Furthermore, the sampling error at bank level will be smaller, as errors will be diversified.

Figure 4 below illustrates an example portfolio in which, with 90% confidence (or "level of assurance" in audit terms), sampling error in the provisioning adjustment is less than or equal to 0.38 percentage points (pp).

Figure 4

Illustrative representation of the meaning of the < 5% sampling error: reported and adjusted provisions for a stylised portfolio, in percentage points over total exposure
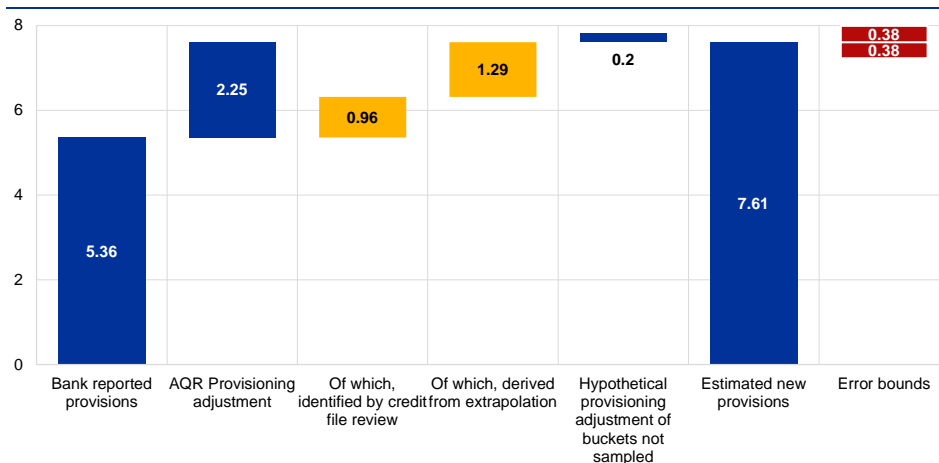
Notes: No projection is applied to portfolios that are not in scope. No projection is applied to strata that were not sampled or that were fully sampled.

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16   ISA 200, A32: *"Audit risk is a function of the risks of material misstatement and detection risk. The assessment of risks is based on audit procedures to obtain information necessary for that purpose and evidence obtained throughout the audit. The assessment of risks is a matter of professional judgment, rather than a matter capable of precise measurement."*

3.6.2   Simulation tool to test the fitness for purpose of the applicable parameters

To illustrate the adequacy of the calibrated parameters, the CPMO has prepared and released a simplified version of the simulation tool used during the design phase. This shows how, through the application of the sampling approach, the adjustment error lies within the boundaries of tolerable error. The remainder of this section outlines how to run the simulation. The bank teams may test the simulation under different specifications so that they can familiarise themselves with the concepts behind the methodology. However, this is not essential for the delivery of the exercise; it is merely to provide a proof of concept for an important element of the approach. It is important to note that it will be possible to set parameters in the model to obtain an error of greater than 5% at 90% confidence level; however, bank teams should ensure that the starting provisioning levels, assumed level of provisioning adjustment and portfolio distribution are plausible.

Data required

The data required to examine the size of the error, are set out in the figure below:

- number of debtors per stratum;

- aggregated exposure per stratum;

- original provisioning levels per stratum, defined as total provisions/total exposure.

Table 58

Data required to simulate adjustment error for an example large corporate portfolio

(Number of debtors within each stratum)

Riskiness bucket	5th pctl.	Bucket 1	Bucket 2	Bucket 3	Bucket 4	Bucket 5	Top10/top8
Default > 12m	7	106	12	6	1	2	8
Default > 6m	3	34	7	4	1	1	8
Default < 6m	4	43	10	7	1	1	8
Significant risk	5	50	16	7	4	-	8
Stage 1 "High risk"	7	86	24	7	6	4	8
Stage 1 "Medium risk"	7	86	24	7	6	4	8
Stage 1 "Low risk"	2	13	9	2	1	2	8
Stage 1 "Very low risk"	225	1,041	75	51	27	6	8

(Aggregated exposure per stratum)

Riskiness bucket	5th pctl.	Bucket 1	Bucket 2	Bucket 3	Bucket 4	Bucket 5	Top10/top8
Default > 12m	19,000	11,470,000	4,959,000	4,764,000	1,108,000	1,989,000	19,660,000
Default > 6m	8,000	2,038,000	1,562,000	1,534,000	550,000	728,000	18,258,000
Default < 6m	4,000	2,390,000	2,360,000	2,904,000	560,000	820,000	15,404,000
Significant risk	6,000	2,862,000	3,710,000	2,872,000	2,350,000	-	26,126,000
Stage 1 "High risk"	3,000	2,711,000	3,357,000	1,557,000	2,062,000	1,701,000	10,545,000
Stage 1 "Medium risk"	3,000	2,711,000	3,357,000	1,557,000	2,062,000	1,701,000	10,545,000
Stage 1 "Low risk"	100,000	1,200,000	1,900,000	700,000	400,000	1,100,000	24,300,000
Stage 1 "Very low risk"	8,000	865,600,000	48,640,000	54,800,000	43,920,000	12,800,000	163,520,000

(Provisioning level)

Default > 12m	45%
Default > 6m	30%
Default < 6m	20%
Significant risk	5.0%
Stage 1 "High risk"	2.0%
Stage 1 "Medium risk"	1.0%
Stage 1 "Low risk"	0.5%
Stage 1 "Very low risk"	0.1%

Parameters required

The simulation tool requires two families of parameters. The first are parameters for determining the sample size, which users are not supposed to modify, as these are the official parameters. The second are parameters to specify the assumptions under which the simulation will run. Users are intended to modify these at their discretion to assess the impact on the adjustment error. These are:

Probability of adjustment

The basic assumption is that the level of provisioning recorded in the books is correct but that a number of observations may require adjustment. This percentage represents the ratio between observations that require adjustment and total observations. It is expected to be higher for NPE and high-risk debtors.

Table 59

Example probability of adjustment as one parameter for the simulation of the adjustment error

(Probability of adjustment)

	5th pctl.	Bucket 1	Bucket 2	Bucket 3	Bucket 4	Bucket 5	Top10/top8
Default > 12m	40%	40%	40%	40%	40%	40%	40%
Default > 6m	35%	35%	35%	35%	35%	35%	35%
Default < 6m	30%	30%	30%	30%	30%	30%	30%
Significant risk	20%	20%	20%	20%	20%	20%	20%
Stage 1 "High risk"	10%	10%	10%	10%	10%	10%	10%
Stage 1 "Medium risk"	5%	5%	5%	5%	5%	5%	5%
Stage 1 "Low risk"	3%	3%	3%	3%	3%	3%	3%
Stage 1 "Very low risk"	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%

Severity of adjustment

For those observations that require adjustment, the severity represents its magnitude. It is expressed as a percentage of the exposure. Therefore, if the provisioning level of an observation is 40%, a severity of adjustment of 40% implies that the provisioning level is doubled. In the example illustrated in **Table 60** below, the average severity of adjustment has been set at 10% for all the strata.

Table 60

Example severity of adjustment as one parameter for the simulation of the adjustment error

(Severity of adjustment)

	5th Pctl.	Bucket 1	Bucket 2	Bucket 3	Bucket 4	Bucket 5	Top10/top8
Default > 12m	20%	20%	20%	20%	20%	20%	20%
Default > 6m	30%	30%	30%	30%	30%	30%	30%
Default < 6m	30%	30%	30%	30%	30%	30%	30%
Significant risk	30%	30%	30%	30%	30%	30%	30%
Stage 1 "High risk"	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Stage 1 "Medium risk"	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Stage 1 "Low risk"	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%
Stage 1 "Very low risk"	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%

It is important that realistic parameters are entered. If probabilities are set to be very high in normal buckets then the error will be larger than 5% at a 90% confidence level.

Calculation and interpretation of outputs

The model is programmed to calculate the required sample size for the input portfolio and to simulate the audit of a sample of such a size, under a large number of scenarios.

Once the user has updated the input data and the simulation parameters, the "Run simulation" button on the "Summary stats" tab triggers a macro that computes 10,000 iterations under the same specifications, recalculating the outcome of the sampling every time. For each iteration, the difference between the "deterministic" (probability x severity) adjustment and the simulated average adjustment is calculated and then divided by the total provisioning level. This is the adjustment error. Iteration by iteration, this error may or may not lie within the acceptable error bound of 5%.

The model sorts down the 1,000 iterations by adjustment error and calculates what the error is at the 90% confidence levels. If the adjustment error for that observation is less than 5%, it can be ensured with at least a 90% confidence that the adjustment error lies within the tolerable boundaries.

It is important to note that the potential for overestimation of misstatement is greatly reduced by the additional safeguards introduced into the approach to projection of findings. As such there will be a much lower chance of a 5% overestimation in projection of findings. Depending on the portfolio this may be below 1%.

An example calculation and output are shown in the attached Excel file "Sampling example.xlsx". The example is provided for information only and is not required to deliver the exercise. The output error estimate for the portfolio data described above is shown below:

Table 61

Error analysis on example portfolio

(Error of projection vs. actual misstatement)

Confidence level	Error in provisions without AQR	Size of error if no projection of findings is performed	Absolute size of error with projection of findings (no safeguards)
85%	24.1%	4.7%	1.4%
90%	24.1%	4.7%	1.6%
95%	24.1%	4.7%	1.9%

As discussed above, the actual error post projection of findings will be greatly reduced by the safeguards introduced into the process.

3.7   Outputs

The objective of this workblock is to select a sample for credit file review that meets minimum audit standards.

The following output will need to be produced for this workblock:

Table 62

Outputs for sampling workblock

Workblock	Output
3. Sampling	Complete T3 Sampling rates template

4   Credit file review

This section outlines the approach to the credit file review component of the AQR. The detailed credit file review provides information about misclassification and under/over-provisioning of sampled exposures. Results are used for DIV, projection of findings of credit file review, collective provisioning and, finally, the AQR-adjusted CET1% calculation. Following the summary of the approach, this section describes how the bank team plans and conducts the required tasks. The required information must first be collected under the credit file review preparation, and then impairment staging classification and exposure classes of exposures are assessed. Finally, the level of expected credit loss (ECL) for exposures classified as credit-impaired is reviewed.

4.1   Summary of the approach

The approach requires the bank team to follow three steps: 1) credit file review data preparation; 2) exposure classification review; and 3) review of individual impairment and provisioning. The full credit file review applies to the sovereign, institutional and corporate exposures selected in the sampling step. RRE exposures are subject to the classification review (performing exposures only) and collateral value review (all exposures).

Credit file review data preparation involves collecting the information necessary to complete the classification review and the individual impairment and provisioning review and verifying the completeness of this information. The bank provides the prescribed information to the bank team for debtors selected in sampling (and their connected clients) in electronic form, including a completed standard Excel template. Information for RRE exposures and sovereign, institutional and corporate exposures that are already credit-impaired are passed to appraisers as soon as possible[17]. During this process the bank team should monitor the bank's progress to ensure that data delivery will be completed on time. The NCA PMO is regularly informed of any implications for timelines from data collection.

The classification review covers RRE, sovereign, institutional and corporate exposures (as per AQR asset segments)[18], where those exposures were selected during the sampling process (priority debtors and risk-based sample). It involves assessing whether the exposure is classified correctly in the bank's systems from five perspectives: 1) impairment classification according to the stages of the IFRS 9 impairment model; 2) NPE classification (according to EBA definition); 3) regulatory exposure class (e.g. exposures secured by mortgages on immovable property); 4)

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[17]   For debtors in the sovereign, institutional and corporate AQR segments, revaluation of collateral is only required if there is evidence of credit-impairment.

[18]   Including all lower-level segments, such as project finance or central governments and central banks.

AQR asset segment (as per AQR definitions); and 5) related party classification (as per IAS 24(9), e.g. other entities with the same parent as the bank). Findings will be used to supplement loan tape-wide DIV, to ensure an adjusted exposure distribution can be created for the bank to feed into stress testing, and to adjust the collective provision challenger model and calculation of probability of impairment (PI) and LGI parameters for the stress test.

The **review of individual impairment and provisioning levels** applies only to sovereign, institutional and corporate exposures (as per AQR asset segments)[19] that are credit-impaired (stage 3 or purchased or originated credit-impaired – POCI), and involves analysing the appropriate provision given the status of the debtor[20]. The approach follows the standard present value of cash flows approach for individual provisioning, with some limited prescription. The bank team first needs to assign probabilities to "going-concern" (i.e. the entity will continue to generate cash flows) and "gone-concern" (i.e. the assets of the company will need to be liquidated) outcomes for the debtor under different scenarios: the baseline and adverse scenarios of the CA and a potential additional scenario proposed by the bank based on its own impairment model. Provisioning levels are then set based on the probability-weighted average of differences between the present value of cash flows and the exposure amount under the different scenarios.

In line with the requirement for the preparation of loan tapes as described in Section 3, the credit file review is conducted at debtor level. This implies that, where the debtor is an entity forming part of a group, financial information at the (sub-)consolidated level of this entity must be used as the basis for the analysis, i.e. it is not acceptable to base the assessment purely on group-level data when the debtor is a subsidiary. Where an explicit guarantee or implicit support by a parent entity is considered key for the creditworthiness of the debtor, group-level information can be taken into account subject to detailed analysis of the terms of the guarantee or the evidence of implicit support.

The bank team reports results in standardised templates to allow for QA, further use in DIV, projection of findings and the challenger model parameterisation for collective provisioning. Any material issues found that have a bearing on the bank's capital calculation or provisioning calculation should be noted, and the bank should be asked to produce a remediation plan to address the issues following the CA.

The bank team should assume for the purposes of planning the exercise that it does not need to explicitly ascertain whether or not there is evidence of fraud on each exposure in the sample. However, if the bank team finds any evidence of fraud in the process of conducting the exercise described below, it should raise this with the NCA and the CPMO to determine the appropriate response.

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[19]   Including all lower-level segments, such as project finance or central governments and central banks.

[20]   Residential real estate undergoes the collective provision analysis described in Section 7.

Where currency conversion is required, the exchange rates used for financial reporting as at the AQR reference date should be used.

4.2 Indicative timeline

The bank team will set a realistic project plan for completion of each step and agree the timeline with the CPMO, the NCA PMO and the bank/external appraisers (where dependencies exist).

Table 63
Indicative timeline for the credit file review

Task	Indicative date
1. Credit file review preparation	
First set of credit files available for priority debtors	Week 8
Finalise credit files for priority groups	Week 11
First set of collateral information passed to appraisers	Week 8
Bank completes submission of credit files	Week 15
2. Classification review	
Review priority debtors	Week 8 – week 11
Review risk-based sample	Week 12 – week 18
3. Individual impairment review	
Review priority debtors	Week 9 – week 13
Review risk-based sample	Week 13 – week 20

The following figure summarises the required work steps for the credit file review.

Figure 5

Flowchart for the credit file review
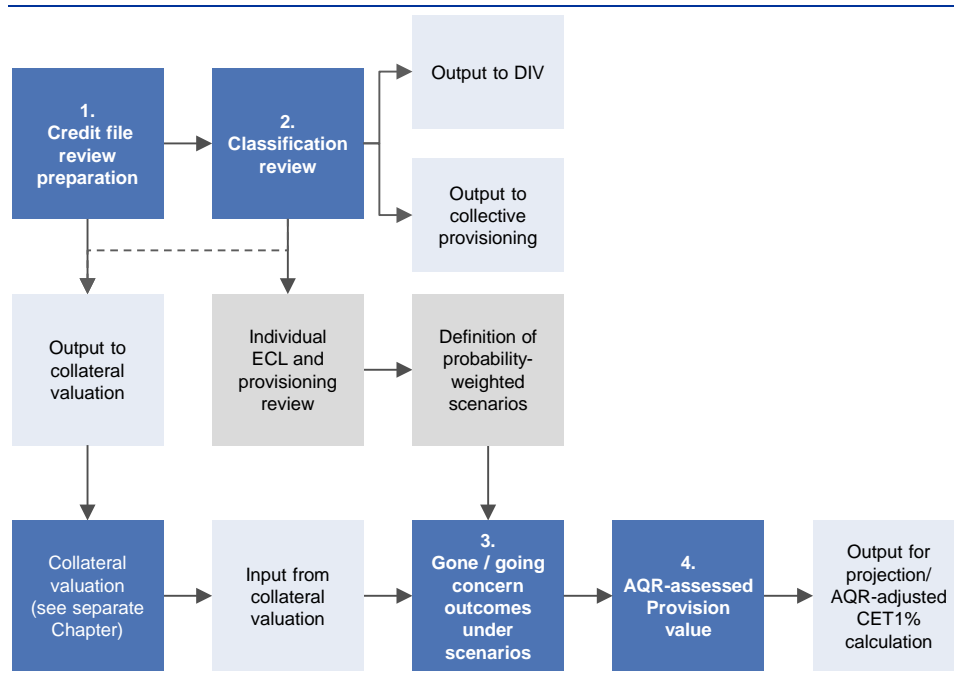
While the steps need to be followed serially for an individual exposure, at an aggregate level **steps can and will be run in parallel**. Bank teams plan the required progress for each of the three steps (no. of files under classification review per week), taking lead times (e.g. credit file collection and collateral review) into account. For instance, the turnaround time for collateral revaluation may be two to three weeks – collateral revaluation requirements should therefore be identified swiftly and exposures that do not require collateral revaluation should be analysed first. Bank teams then monitor progress in line with the plan and verify planned lead times. This will enable areas of slow progress and data issues to be detected early and resolved.

4.3   Illustrative models, parameter sheets and templates

The following illustrative models, parameter sheets and templates are relevant for this workblock:

Table 64

Parameter sheet for credit file review

Subject	Parameter sheet
Collateral and other macro indices	Parameter sheet for collateral indices and other macro indices

Table 65

Templates for credit file review

Template	Summary of contents	Frequency of submission to CPMO
T4A. Credit file review data template	Template for banks to complete with key information on individual debtors that have been sampled (to streamline file analysis process for bank teams)	Submission only upon CPMO request
T4B. Credit file review findings template	Template capturing findings from credit file review for each debtor	Weekly submission of WIP template

4.4 Credit file review preparation

The bank team must have timely access to the appropriate information on each debtor included in the sample and any associated debtor in the same group of connected clients. This includes, but is not limited to, information typically stored in the credit file (which might be stored in electronic or physical format). Data should be provided as at the AQR reference date for consistency with the loan tape. If this is not possible, current information should be provided.

Four steps are required for each sampled item during the preparation process:

1. information request by the bank team;

2. information gathering by the bank, monitored by the bank team;

3. information integrity and completeness check by the bank team;

4. information provision to appraisers by the bank team.

The bank team should then inform the bank of the debtor IDs (R_IDFD) that have been selected for review (see Section 3 for details of sampling) and agree on delivery timelines. While sampling is performed at debtor level, the credit file review requires visibility and analysis of all relevant information and exposures for groups of connected clients. Therefore, the bank team requests all credit files for all debtor IDs belonging to the same group of connected clients as the sampled debtor ID that may have a material impact on the assessment of the debtor. For the avoidance of doubt, the bank team is not required to collect information on all debtors in a group of connected clients; information on debtors that will have no bearing on the assessment of the debtor that was sampled need not be collected.

The bank then needs to collect the required information and provide it in a usable form to the bank team, which will also involve the bank completing data templates to be provided by the CPMO.

Key information to be provided to the bank team (unless legal restrictions apply) comprises:

-   bank credit papers (credit mark-ups, lender report);

- loan application and credit decision;

- facility offer letter;

- loan and pledge contracts;

- financial statements of the company;

- details of connected accounts;

- collateral information;

- collateral appraisal report;

- agreements relating to guarantees, lien on collateral, etc.;

- historical account information for the previous two to three years, e.g. credit history, ratings history, periodic reviews;

- details of the debtor's tax affairs;

- any other information that the bank deems deemed materially relevant for the credit assessment.

During this process, the bank team should monitor the bank's progress to ensure data delivery will be completed on time. **The bank team regularly informs the NCA PMO of any implications for timelines from data collection.**

Interviews are an additional means of retrieving information, where a bank team deems them to be relevant (e.g. for larger exposures).

As files arrive, the bank team verifies the integrity of the information provided in the loan tape with the data in the credit file.[21] Before the classification review begins, the bank team should ensure that there is sufficient information available to properly review the credit. If any data are missing or incorrect, the bank should be contacted to rectify the specific issues. Any deviations from the loan tape should be recorded giving the correct values on the credit file review template and a short explanation as to why the data were wrong. Data-related findings should be incorporated into the final report for DIV (e.g. patterns of misclassification, data issues). All other qualitative findings (such as weaknesses in provisioning processes) should be reported using template O4B.

The bank team will provide the necessary collateral information for RRE exposures and sovereign, institutional and corporate exposures that are already credit-impaired to appraisers in a timely manner. The appraisers may or may not be a team within the bank team or a different third party. Collateral information for performing exposures that are reclassified as credit-impaired should be passed for appraisal as

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[21] The bank team could use an audit access to the bank's loan management system (core banking system) and collateral management system to verify the integrity.

soon as possible. It is important to avoid delays in passing on the information, as the collateral valuation results are required for the impairment review.

If the required information is not available to analyse a debtor, then the bank team needs to decide whether or not to replace the debtor in the sample[22]. The following approach should be taken.

- If the exposure has been amortised or one of the exclusion conditions described in Section 3.5.1 apply – the file must be replaced[23, 24].
- If some information is missing but a reliable assessment of the debtor can still be made based on other available information – no replacement applies[25].
- If some information is missing, other information is sought but not available – no replacement applies, but the information shortfall should be bridged with sufficiently prudent assumptions[26, 27].
- If the exposure lacks critical information or information is entirely missing – in these circumstances, the whole exposure should be considered as a misstatement and a 100% provision should be applied. However, this exposure should be treated as an anomaly in the context of the misstatement projection of findings[28] (see Section 6) and so should not be

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[22] AU-C Section 530, .A19: *"In some circumstances, the auditor may not be able to apply the planned audit procedures to select sample items because, for example, the entity might not be able to locate supporting documentation. The auditor's treatment of unexamined items will depend on their effect on the auditor's evaluation of the sample. If the auditor's evaluation of the sample results would not be altered by considering those unexamined items to be misstated, it may not be necessary to examine the items, for example, if the aggregate amount of the unexamined items, if treated as misstatements or deviations, would not cause the auditor's assessment of the amount of the misstatement or deviation in the population to exceed tolerable misstatement or tolerable deviation, respectively. However, when this is not the case the auditor is required by paragraph .11 to perform alternative procedures that provide sufficient appropriate audit evidence to form a conclusion about the sample item and use the results of these procedures in assessing the sample results. If alternative procedures cannot be satisfactorily performed in these cases, the auditor is required to treat the items as misstatements or deviations, as appropriate, in evaluating the results of the sample. Section 240, Consideration of Fraud in a Financial Statement Audit, also requires the auditor to consider whether the reasons for the auditor's inability to examine the items have implications with regards to assessing risks of material misstatement due to fraud, the assessed level of control risk that the auditor expects to be supported, or the degree of reliance on management representations."*

[23] AU-C Section 530, Paragraph .10: *"If the audit procedure is not applicable to the selected item, the auditor shall perform the procedure on a replacement item."*

[24] ISA 530, A14: *"An example of when it is necessary to perform the procedure on a replacement item is when a voided check is selected while testing for evidence of payment authorization. If the auditor is satisfied that the check has been properly voided such that it does not constitute a deviation, an appropriately chosen replacement is examined."*

[25] ISA 530, A16: *"An example of a suitable alternative procedure might be the examination of subsequent cash receipts together with evidence of their source and the items they are intended to settle when no reply has been received in response to a positive confirmation request."*

[26] AU-C Section 530, Paragraph 11: *"If the auditor is unable to apply the designed audit procedures, or suitable alternative procedures, to a selected item, the auditor should treat that item as a deviation from the prescribed control (in the case of tests of controls) or a misstatement (in the case of tests of details)."*

[27] ISA 530, A15: *"An example of when the auditor is unable to apply the designed audit procedures to a selected item is when documentation relating to that item has been lost."*

[28] ISA 530, A19: *"When a misstatement has been established as an anomaly, it may be excluded when projecting misstatements to the population. However, the effect of any such misstatement, if uncorrected, still needs to be considered in addition to the projection of the non-anomalous misstatements."*

included in the projection of findings to unsampled parts of the portfolio. In observance of the principle of sufficiency, the file will be replaced with another of the same portfolio and stratum[29].

In general, circumstances suggesting that a replacement is necessary will be considered exceptional and must be flagged to the NCA before the replacement is made, with a clear explanation of the circumstances and proposed approach. The bank team must describe the most likely nature or cause of the circumstance on a best-efforts basis, as it might indicate intent or the possibility of fraud[30]. Authorisation by the corresponding NCA is a prerequisite for replacement.

A debtor from a given portfolio and stratum may only be replaced with another debtor from the same portfolio and stratum.

For the avoidance of doubt, the following non-exhaustive list of examples is meant to illustrate – in the context of file replacement alone – what is and is not considered sufficiently prudent, suitable alternative procedures and critical information.

Sufficiently prudent:

- In the absence of information on the type of real estate collateral, assume the worst case for the purposes of defining yield assumptions and collateral valuation (e.g. assume real estate is secondary industrial)

- Where updated information about compliance with covenants is missing, sufficiently prudent means assuming that the covenant has been breached

Suitable alternative procedures:

- If the latest appraisal report for a collateral item is missing, a suitable alternative procedure would be to obtain the public property registry information and carry out a desk-based reappraisal based on that

- If information for the recalculation of LTV is missing, using a portfolio benchmark would never be considered a suitable alternative procedure

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[29] ISA 530, A21: *"For tests of controls, an unexpectedly high sample deviation rate may lead to an increase in the assessed risk of material misstatement, unless further audit evidence substantiating the initial assessment is obtained. For tests of details, an unexpectedly high misstatement amount in a sample may cause the auditor to believe that a class of transactions or account balance is materially misstated, in the absence of further audit evidence that no material misstatement exists."*

[30] ISA 530, A17: *"In analyzing the deviations and misstatements identified, the auditor may observe that many have a common feature, for example, type of transaction, location, product line or period of time. In such circumstances, the auditor may decide to identify all items in the population that possess the common feature, and extend audit procedures to those items. In addition, such deviations or misstatements may be intentional, and may indicate the possibility of fraud."*

Examples of critical information:

- Historical behavioural information of the client (repayment, days past due, etc.)

- Prospective client risk initial assessment and client risk monitoring reports

- Information required to form a robust opinion about the applicability of impairment triggers

4.5 Classification review

All exposures selected in the sample selection process undergo a classification review. The classification review described in the following subsections focuses on the adequacy of impairment staging classification, NPE classification, regulatory exposure classification, AQR asset segment classification and related party transactions. The guidance is to be applied to **each debtor** selected. It is practicable to assess all exposures to a given debtor at the same time.

The bank team should begin reviewing loan files **as soon as they are available**. This would be expected to be from week 8 for the priority debtor exposures, as they should have been identified and made available before the risk-based sample is selected. Similarly, other larger or distressed exposures that are sampled are likely to be easily accessible by the bank and therefore available relatively swiftly after the sample is selected. However, it may take longer to acquire the data for smaller, "normal" exposures.

The following sections provide further information on how classifications should be verified. The respective classification checks are not required for RRE that is already classified as impaired or NPE.

4.5.1 Impairment and provisioning classification

In line with IFRS 9, the bank must clearly identify any exposures classified as stage 3 (credit-impaired) or stage 2 (SICR) so that appropriate provisioning approaches can be assigned.

IFRS 9 – Appendix A

A financial asset is credit-impaired when one or more events that have a detrimental impact on the estimated future cash flows of that financial asset have occurred. Evidence that a financial asset is credit-impaired include observable data about the following events:

1. significant financial difficulty of the issuer or the borrower;

2. a breach of contract, such as a default or **past due** event;

3.   the lender(s) of the borrower, for economic or contractual reasons relating to the borrower's financial difficulty, having granted to the borrower a concession(s) that the lender(s) would not otherwise consider;

4.   it is becoming probable that the borrower will enter bankruptcy or other financial reorganisation;

5.   the disappearance of an active market for that financial asset because of financial difficulties; or

6.   the purchase or origination of a financial asset at a deep discount that reflects the incurred **credit losses**.

It may not be possible to identify a single discrete event. Instead, the combined effect of several events may have caused the financial asset to become credit-impaired.

IFRS 9 5.5.9.

At each reporting date, an entity shall assess whether the credit risk on a financial instrument has increased significantly since initial recognition. When making the assessment, an entity shall use the change in the risk of a default occurring over the expected life of the financial instrument instead of the change in the amount of expected credit losses. To make that assessment, an entity shall compare the risk of a default occurring on the financial instrument as at the reporting date with the risk of a default occurring on the financial instrument as at the date of initial recognition and consider reasonable and supportable information, that is available without undue cost or effort, that is indicative of significant increases in credit risk since initial recognition.

IFRS 9 5.5.3

Subject to paragraphs 5.5.13–5.5.16, at each reporting date, an entity shall measure the loss allowance for a financial instrument at an amount equal to the lifetime expected credit losses if the credit risk on that financial instrument has increased significantly since initial recognition.

The bank team first compares the bank's staging triggers as of the AQR reference date with the **minimum triggers** under IFRS 9 for assessing whether a financial asset is credit-impaired or subject to SICR since initial recognition, as shown in Table 66. Where the bank has defined additional or more conservative triggers, these should also be considered in addition to the minimum triggers. This implies that the AQR definition of evidence that an asset is credit-impaired or subject to SICR is at least as conservative as the bank's current approach. All exposures classified as non-performing (as per definition in the EBA ITS) are to be treated as credit-impaired (stage 3).

Table 66

Minimum triggers for IFRS 9 staging classification

Triggers for credit impairment

Events indicative of credit impairment	Minimum triggers
(a) Significant financial difficulty of the issuer or the borrower[31]	Deterioration in external or internal rating (risk category methodology as described in Section 3.5.3) 5Y CDS > 1,000 bps within last 12 months Equity reduced by 50% within a reporting period Debtor has requested emergency funding with the bank Material amount past due to public creditors or employees Material decrease in the collateral value where the sale of the financed asset is required to repay the loan (e.g. CRE) Material increase in the loan-to-value ratio Material decrease in turnover or the loss of a major client Material decrease in estimated future cash flows Current debt service coverage ratio is below 1.1
(b) A breach of contract, such as a default or past due event	> 90 days past due on any facility at debtor level (subject to materiality criteria) Covenant breach not waived by the bank ISDA credit event declared
(c) The lender(s) of the borrower, for economic or contractual reasons relating to the borrower's financial difficulty, having granted to the borrower a concession(s) that the lender(s) would not otherwise consider	All exposures that would be defined as forborne NPEs (as per definition in the EBA ITS)
(d) It is becoming probable that the borrower will enter bankruptcy or other financial reorganisation	Debtor has filed a bankruptcy application Any legal entity within the debtor's group of connected clients (incl. subsidiaries of the debtor) has filed a bankruptcy application
(e) The disappearance of an active market for that financial asset because of financial difficulties	Bond trade (temporarily) suspended at primary exchange because of rumours or facts about financial difficulties Evidence of the disappearance of an active market for that financial asset The disappearance of a market for refinancing options for the debtor
(f) The purchase or origination of a financial asset at a deep discount that reflects the incurred credit losses	Deep discount observed at origination/purchase of the financial instrument

Triggers for SICR since initial recognition

Events indicative of credit impairment	Minimum triggers
Change in PD[32]	Lifetime PD of the exposure on the reporting date exceeds its lifetime PD at initial recognition by more than 200%
Absolute PD level	12-month PD of the exposure on the reporting date exceeds 20%

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[31] In assessing whether a given trigger is indicative of significant financial difficulty, the bank team should consider the overall context of the debtor's economic situation, including factors such as typical revenue/cash flow patterns for the sector concerned.

[32] It may be acceptable to assess this trigger by considering changes in 12-month PD rather than lifetime PD in cases where the bank uses this practical expedient for accounting purposes. In such cases the bank is required to submit evidence to the CPMO demonstrating that changes in the 12-month PD of the portfolio concerned are a reasonable approximation for changes in its lifetime PD (i.e. showing that default patterns of the financial instruments in the portfolio are not concentrated at a specific point during their expected life).

Delinquency (days past due)	Payments on the exposure are more than 30 days past due
Watch list, forbearance or restructuring status	Exposure is included on the bank's watch list, is flagged as forborne (as per EBA definition) or has been subject to restructuring due to financial difficulty
Low credit risk exemption	Only exposures with a 12-month PD exceeding 0.3% are to be considered for SICR assessment

The above triggers for SICR are those described as SICR backstops in Section 2.1.8, meaning their assessment needs to take account of the CPMO decisions on potential requests for rebuttal in line with Section 2.1.8. In addition to these triggers, the bank team must consider the following factors[33] when assessing SICR:

- cases where individual triggers for credit impairment are hit but are assessed as not warranting credit-impaired status based on the debtor's overall situation;

- additional qualitative triggers listed in Commission Regulation (EU) 2016/2067 IFRS 9 B5.5.17.

IFRS 9 – B5.5.17
The following non-exhaustive list of information may be relevant in assessing changes in credit risk:

1. significant changes in internal price indicators of credit risk as a result of a change in credit risk since inception, including, but not limited to, the credit spread that would result if a particular financial instrument or similar financial instrument with the same terms and the same counterparty were newly originated or issued at the reporting date.

2. other changes in the rates or terms of an existing financial instrument that would be significantly different if the instrument was newly originated or issued at the reporting date (such as more stringent covenants, increased amounts of collateral or guarantees, or higher income coverage) because of changes in the credit risk of the financial instrument since initial recognition.

3. significant changes in external market indicators of credit risk for a particular financial instrument or similar financial instruments with the same expected life. Changes in market indicators of credit risk include, but are not limited to:

(a)   the credit spread;

(b)   the credit default swap prices for the borrower;

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[33]   It should be noted that a potential rebuttal of a specific SICR backstop does not preclude the reclassification of an exposure as stage 2 based on other backstops and/or the additional factors described in this section.

(c)   the length of time or the extent to which the fair value of a financial asset has been less than its amortised cost; and

(d)   other market information related to the borrower, such as changes in the price of a borrower's debt and equity instruments.

4. an actual or expected significant change in the financial instrument's external credit rating.

5. an actual or expected internal credit rating downgrade for the borrower or decrease in behavioural scoring used to assess credit risk internally. Internal credit ratings and internal behavioural scoring are more reliable when they are mapped to external ratings or supported by default studies.

6. existing or forecast adverse changes in business, financial or economic conditions that are expected to cause a significant change in the borrower's ability to meet its debt obligations, such as an actual or expected increase in interest rates or an actual or expected significant increase in unemployment rates.

7. an actual or expected significant change in the operating results of the borrower. Examples include actual or expected declining revenues or margins, increasing operating risks, working capital deficiencies, decreasing asset quality, increased balance sheet leverage, liquidity, management problems or changes in the scope of business or organisational structure (such as the discontinuance of a segment of the business) that results in a significant change in the borrower's ability to meet its debt obligations.

8. significant increases in credit risk on other financial instruments of the same borrower.

9. an actual or expected significant adverse change in the regulatory, economic, or technological environment of the borrower that results in a significant change in the borrower's ability to meet its debt obligations, such as a decline in the demand for the borrower's sales product because of a shift in technology.

10. significant changes in the value of the collateral supporting the obligation or in the quality of third-party guarantees or credit enhancements, which are expected to reduce the borrower's economic incentive to make scheduled contractual payments or to otherwise have an effect on the probability of a default occurring. For example, if the value of collateral declines because house prices decline, borrowers in some jurisdictions have a greater incentive to default on their mortgages.

11. a significant change in the quality of the guarantee provided by a shareholder (or an individual's parents) if the shareholder (or parents) have an incentive and financial ability to prevent default by capital or cash infusion.

12. significant changes, such as reductions in financial support from a parent entity or other affiliate or an actual or expected significant change in the quality of credit enhancement, that are expected to reduce the borrower's economic incentive to make scheduled contractual payments. Credit quality enhancements or support include the consideration of the financial condition of the guarantor and/or, for interests issued in securitisations, whether subordinated interests are expected to be capable of absorbing expected credit losses (for example, on the loans underlying the security).

13. expected changes in the loan documentation including an expected breach of contract that may lead to covenant waivers or amendments, interest payment holidays, interest rate step-ups, requiring additional collateral or guarantees, or other changes to the contractual framework of the instrument.

14. significant changes in the expected performance and behaviour of the borrower, including changes in the payment status of borrowers in the group (for example, an increase in the expected number or extent of delayed contractual payments or significant increases in the expected number of credit card borrowers who are expected to approach or exceed their credit limit or who are expected to be paying the minimum monthly amount).

15. changes in the entity's credit management approach in relation to the financial instrument; i.e. based on emerging indicators of changes in the credit risk of the financial instrument, the entity's credit risk management practice is expected to become more active or to be focused on managing the instrument, including the instrument becoming more closely monitored or controlled, or the entity specifically intervening with the borrower.

16. past due information, including the rebuttable presumption as set out in paragraph 5.5.11.

The bank team should assess each exposure in the sample for objective evidence of credit impairment and SICR as of the AQR reference date. This requires a two-step approach. Each exposure is first assessed to determine whether one or more events have occurred or information has become available that may signal SICR, or that may have a detrimental impact on the estimated future cash flows associated with the exposure based on the triggers provided (see previous paragraph). Not all triggers apply to each debtor (e.g. CDSs are not relevant for retail mortgages or large SMEs). The appropriateness of the IFRS 9 credit quality staging assessment is then reviewed for each exposure and revised where necessary based on the information gathered in the first step or otherwise available at the time of review.

Impacts on **future cash flows** include:

- deferral or (temporary) discontinuation of cash flows;

- modification of repayment terms under forbearance measures;

- debtor has filed or is likely to file a bankruptcy application;

- any legal entity within the debtor's group of connected clients (incl. subsidiaries of the debtor) is likely to or has filed a bankruptcy application;

- initiation of legal proceedings against the debtor by the bank or another creditor;

- diversion of cash flows;

- material amount already past due (to the bank or any creditor);

- material amount expected to be past due (to the bank any creditor);

- material amount past due to public creditors or employees;

- major suppliers requiring delivery versus payment who had previously granted supplier credit;

- diversion of cash flows from earning assets to support non-earning assets;

- use of loaned funds for a different purpose than provided for in the loan contract;

- material decrease in estimated future cash flows of the debtor;

- material decrease in turnover or the loss of a major client;

- material decrease in rents received on a buy-to-let property;

- breach of financial covenants;

- decrease in the value of collateral or disappearance of an active market in cases where repayment of the loan is dependent on the liquidation of collateral;

- foreclosure of significant assets and equipment used in the debtor's production process by another creditor;

- any other observable information indicating a material decrease in the estimated future cash flows;

- inability to repay bullet/principal due to insufficient cash flow or unavailability of refinancing;

- debt service coverage ratio of less than 1.1;

- inability to meet future interest payments;

- disappearance of a market for refinancing options for the debtor.

Note: Under IFRS 9 current or past cash flows do not necessarily need to be impacted for an exposure to be considered as credit-impaired (stage 3) or SICR (stage 2).

Bank teams classify exposures as showing evidence of credit impairment irrespective of whether or not the impacted future cash flows indicate that ECL should be registered (i.e. credit-impaired exposures where ECL are assessed as zero due to collateral should still be classified as credit-impaired because cash flows will be impacted by the foreclosure of collateral).

If at least one material exposure to a given sovereign/institutional/corporate debtor is classified as credit-impaired, all on and off-balance-sheet exposures to this debtor are considered as showing evidence of credit impairment. The materiality of an exposure is assessed against the threshold defined by the competent authorities according to Article 178(2)(d) of the CRR. If a debtor belongs to a group (of connected clients), credit impairment of a debtor in the group should be considered during the staging assessment, **but does not necessarily imply that all debtors in the group of connected clients should be considered to be credit-impaired** if other debtors in the group are not expected to suffer any disruption in contractual cash flows.

Where the current staging classification is not appropriate, the bank team determines the new classification. Bank teams must provide a short explanation for the change in classification.

If an event indicative of credit impairment occurs before or on the AQR reference date but knowledge of it is not obtained until afterwards, it must be taken into account for the purposes of assigning credit-impaired status. If the trigger event occurs after the AQR reference date it should, for the purposes of the exercise, be considered in the assessment of SICR (stage 2), i.e. treated as forward-looking information indicating a high likelihood of future losses.

As indicated above, during the credit file review the outcome of the staging classification review must, at facility level, always reflect the more conservative of the bank's original assessment and the revised view formed by the bank team. For the avoidance of doubt, this means that no reclassification from stage 3 to stage 2 or stage 1, or from stage 2 to stage 1, is carried out for any given facility. This is deemed appropriate for the following reasons in particular:

- The potential impact of moving from stage 3 to stage 2 is severely limited due to the requirement to use lifetime ECL methodology for both stage 2 and stage 3.

- Where there are differences, the stage 3 classification and subsequent in-depth review of individual provisions is expected to give a more accurate result than moving the exposure in question to the collective provisioning approach used to review stage 2 provisions.

- Reclassifications from stage 2 to stage 1 are generally not considered possible, since the bank's list of exposures classified as stage 2 should be treated as one of the watch lists to be considered for the purposes of stage classification under IFRS 9.

Any staging adjustments that are due to a breach of both accounting rules and ECB thresholds should be flagged separately from adjustments due solely to a breach of ECB thresholds. A field is included in the T4B template for this purpose. It is up to the NCA to decide which adjustments the bank should be required to make to its accounts following the CA.

4.5.2   NPE classification

The NPE classification of each exposure should be verified. Two NPE definitions should be checked: the bank's internal NPE definition and the EBA definition. The definition should be based on revised impairment classifications (as set out above). All exposures classified as stage 3 should be classified as NPEs.

- Internal NPE definition = performing

- EBA NPE definition = non-performing

NPE classifications are covered in S_NPEINT, S_NPEAQR and S_NPE12M in the debtor view of the loan tape for non-retail exposures and in the facility view for RRE exposures.

4.5.3   Regulatory exposure classification

To comply with regulatory capital requirements, exposures are classified according to various categories such as institutions, corporate, retail, etc. Bank teams assess the adequacy of the regulatory exposure class as follows:

Where a bank uses the standardised approach to calculate RWA, the exposure classification set out in Article 112 of the CRR[34] is used;

Where a bank uses the internal ratings-based (IRB) approach to calculate RWA, the exposure classification set out in Article 147 of the CRR[35] is used.

The classification is reviewed in line with the rules set out in the CRR. Bank teams must pay particular attention to:

- outdated data used for classification (e.g. €1 million exposure limit for retail according to Article 123c of the CRR);

- areas where there might be room for interpretation of rules (e.g. retail or corporate);

- patterns of misclassification[36].

Exposures classified as credit-impaired are classified as defaulted, i.e. PD = 1.

Where there are differences, bank teams determine the correct exposure classification. Where there are patterns of classification differences, bank teams obtain additional information about the significance of the difference. If the pattern is expected to affect > 1% of the total banking book exposure, bank teams reflect this pattern in the projection of findings of credit file review process (see Section 6).

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[34] Central governments or central banks; regional governments or local authorities; public sector entities; multilateral development banks; international organisations; institutions; corporates; retail exposures; secured by mortgages on immovable property; exposures in default; exposures associated with particularly high risk; exposures in the form of covered bonds; items representing securitisation positions; exposures to institutions and corporates with a short-term credit assessment; exposures in the form of units or shares in collective investment undertakings (CIUs); equity exposures; other items.

[35] Central governments and central banks; institutions; corporates; retail exposures; equity exposures; items representing securitisation positions; other non-credit-obligation assets.

[36] An individual misclassification occurs due to the data available for the individual case. A pattern of misclassification exists where a common logic or process is inadequate.

If there are significant patterns of misclassification (> 1%), or if the bank team has significant doubts over the quality of the regulatory exposure classification due to a high number of individual misclassifications (e.g. 5% of the sampled exposures are misclassified), the bank is expected to develop an action plan to remediate the issues.

The bank is expected to correct misclassifications that may lead to a change in RWAs (including changing risk weights for defaulted exposures) following the CA.

Example

Bank A has classified all exposures to the company "Smith Manufacturing" as exposures to corporates, including the equity instruments that bank A holds. The equity instruments should have been classified as equity exposures. The bank team finds several similar cases and asks for an explanation.

The finding is that bank A has significant data quality issues due to manual data entry. Bank A devises a remediation plan to resolve this issue by implementing a more automated process.

Regulatory exposure classifications are covered in the field S_CRR in the facility view of the loan tape.

4.5.4   AQR asset segment classification

All exposures are mapped to the AQR asset segments in the loan tape. Bank teams verify the adequacy of the AQR asset exposure segmentation in line with the definitions provided.

While automated checks based on the information in the loan tape are part of DIV, in the classification review bank teams should use the additional information from the credit file on the sampled exposures to verify the AQR segment. This includes, as a minimum, the loan application, bank credit papers, facility offer letter and collateral information.

Example

Bank A has classified a sampled exposure as "Aviation". The bank team verifies that the exposure is indeed a loan and not a securitisation. The debtor is a large airline, so the classification as an exposure to corporates is correct.

The bank team then screens the collateralisation agreement and finds that while all exposures to this debtor are secured against aeroplanes, this exposure is not. The bank team assigns it to the correct asset segment "large corporates (non-real estate)".

Where there are differences, bank teams determine the correct loan segmentation classification. Bank teams pay particular attention to patterns of classification differences. Where there are such patterns, bank teams obtain additional information about the significance of the difference. If the pattern is expected to affect > 1% of the total banking book exposure, bank teams make corrections in the projection of findings of credit file review process (see Section 6).

AQR asset segment classifications are covered in the field S_AQRASF in the facility view of the loan tape (for RRE) and in the field S_AQRSD in the debtor view of the loan tape (for non-retail).

4.5.5   Related party transactions

All exposures to debtors meeting the definition of a related party should be indicated as such in the loan tape. As the final step in the classification review, the bank team should therefore assess whether the debtor should be considered to be a related party in accordance with IAS 24. This is not required for RRE.

IAS 24, Para. 9 (EU)

A related party is a person or entity that is related to the entity that is preparing its financial statements […]

1.   A person or a close member of that person's family is related to a reporting entity if that person:

(a)   has control or joint control over the reporting entity;

(b)   has significant influence over the reporting entity; or

(c)   is a member of the key management personnel of the reporting entity or of a parent of the reporting entity.

2.   An entity is related to a reporting entity if any of the following conditions applies:

(a)   The entity and the reporting entity are members of the same group (which means that each parent, subsidiary and fellow subsidiary is related to the others).

(b)   One entity is an associate or joint venture of the other entity (or an associate or joint venture of a member of a group of which the other entity is a member).

(c)   Both entities are joint ventures of the same third party.

(d)   One entity is a joint venture of a third entity and the other entity is an associate of the third entity.

(e)   The entity is a post-employment benefit plan for the benefit of employees of either the reporting entity or an entity related to the reporting entity. If the reporting entity is itself such a plan, the sponsoring employers are also related to the reporting entity.

(f)   The entity is controlled or jointly controlled by a person identified in (1).

(g)   A person identified in (1)(a) has significant influence over the entity or is a member of the key management personnel of the entity (or of a parent of the entity).

[…]

Related party classification is covered in the field R_RELATD in the debtor view of the loan tape (non-retail only).

The financing of a third party to purchase assets from a related party should also be flagged separately, and all collateral worth > €100,000 should be revalued by a third party (all exclusions/limitations described in the collateral valuation section of this document should not apply).

4.6   Individual ECL and provisioning review

Exposures classified as credit-impaired that qualify for individual assessment undergo the individual ECL review described in this section. All sovereign, institutional and corporate exposures according to AQR asset segmentation qualify for individual ECL assessment. Guidance for the calculation of provisions for undrawn financial guarantees and loan commitments is also provided.

While information about the group of connected clients is required for the ECL and provisioning review, only the ECL/provisions for the sampled debtor in question are calculated.

While the methodology described uses IFRS terminology, a consistent approach should be followed as far as possible for banks that apply national GAAP (and for debtors using national GAAP). Where the relevant accounting standard provides for a change in reserves or provisions rather than an increase in ECL, reserves or provisions should be changed accordingly. To improve readability, the remainder of this section refers to an increase in ECL.

To determine ECL, the bank team estimates the recoverable amount (the present value of the estimated future cash flows the entity expects to receive) for the exposure.

The approach requires the bank team to conduct the following three tasks to determine ECL:

1. determine probability-weighted estimates of gone and going-concern outcomes for DCF analysis for each scenario considered;

2. perform a DCF analysis for all scenarios;

3. derive the ECL estimate.

The incorporation of forward-looking information in the ECL analysis is based on the baseline and adverse scenario of the CA stress test. In cases where the bank uses an upturn scenario as part of its own impairment model, it may propose that this be included in addition to the above baseline and adverse scenarios where this is deemed necessary to ensure an unbiased estimate of ECL for a given portfolio. As a first step, the bank team determines specific probabilities that are ascribed to the macroeconomic scenarios at the level of the portfolio to which the exposure pertains. The following simplified approach serves as a starting point.

• Historical time series of the key macroeconomic variables projected in the scenarios are sourced for the relevant geographies.

• The probability ascribed to the adverse scenario is determined as the relative likelihood of macroeconomic conditions being equal to or worse than those specified in the scenario as per the historical time series of the relevant variables.

• The probability ascribed to the (optional) upturn scenario is determined as the relative likelihood of macroeconomic conditions being equal to or better than those specified in the scenario as per the historical time series of the relevant variables. The probability ascribed to the upturn scenario should not exceed that of the adverse scenario.

• The probability of the baseline scenario is determined as 1 minus the probabilities of the adverse and the (optional) upturn scenario.

The CPMO may provide minimum probabilities to be ascribed to the adverse and baseline scenario based on the final scenario specifications and narrative from the CA stress test. Bank teams are encouraged to increase the complexity of the model and/or propose modifications to the approach outlined above to the extent that this is deemed to increase the accuracy of the scenario weights. Existing macroeconomic

models employed by the bank may be used for this purpose provided that the methodology and calibration documentation is of sufficient quality. In any event, central QA focuses in particular on probability weights for the scenarios (including drivers such as the choice of macroeconomic variables, length and representativeness of time series used, etc.).

As a second step, the bank team determines the probabilities of going-concern and gone-concern outcomes for the debtor under each scenario. The bank team is responsible to propose which aspects, apart from those explicitly mentioned below, require differentiated assumptions under each scenario. The bank team's proposal should typically take account of the bank's specific portfolio makeup and economic environment. The choices made are entered in the output template for the workblock (T4B) and are subject to specific scrutiny during the QA process, in particular where found to be outside of expectations for the market, portfolio type or scenario definitions.

Under the **going-concern** approach, operating cash flows continue and can be used to repay financial debt to all creditors. Collateral may also be exercised to the extent that this does not affect operating cash flows (e.g. premises pledged as collateral cannot be exercised without impacting cash flows, while stock or commodities pledged in connection with asset-based lending products cannot be sold without significantly impacting business operations). The probability of this outcome increases if, for example:

- the debtor's future operating cash flows are material and can be reliably estimated;

- there is only limited collateralisation of the exposure.

Under the **gone-concern** approach, the collateral is exercised and the debtor's operating cash flows cease. The probability of this outcome increases if, for example:

- the debtor's future operating cash flows are estimated to be low or negative;

- the exposure to the debtor is significantly collateralised and this collateral is central to cash flow generation;

- the going-concern approach would have a material negative impact on the recoverable amount for the bank (e.g. further drain on financial resources, reduction in the value of collateral).

The bank's choice regarding the weights of going and gone-concern outcomes under the scenarios considered can be used as an input, but needs to be challenged by the bank team. For the adverse scenario, the probability ascribed to a gone-concern outcome may not be 0%.

If insufficient information is available to perform a going-concern analysis or the latter would imply higher ECL than a gone-concern analysis, an analysis with a 100% gone-concern outcome should be performed. If this is viewed as too conservative for

a particular portfolio, the challenger model analysis for collective provisions may be applied as described in Section 8. If a collective provisioning approach is used, however, it must be applied for the whole portfolio and not just for the parts for which financial information is not available.

Where the carrying amount of an exposure exceeds the recoverable amount, an increase in ECL is required. The following analysis is carried out at exposure level.

ECL are defined as *ECL = Gross carrying amount – Recoverable amount*

The gross carrying amount is the amortised cost of a financial asset before adjusting for any loss allowance.

If the recoverable amount of a previously credit-impaired exposure is greater than its gross carrying amount, the bank team considers a (partial) reduction in ECL after examining the drivers of the bank's own ECL estimate and ensuring that the bank team's estimate is sufficiently conservative.

This requires other objective evidence that ECL are lower than originally anticipated. This may be assumed to be true in the following cases (non-exhaustive list):

- the debtor has amortised a higher fraction of the outstanding debt than anticipated at the time of the previous ECL assessment;

- the debtor has provided additional collateral since the previous ECL assessment;

- cash flows have improved;

- any other event that has led to an improvement in the amount recoverable from this debtor.

Example

Case 1:

Exposure of €100; previous assessed ECL of 0; recoverable amount = €80

ECL = €100 – €80 = €20

Case 2:

Exposure of €100; no previous ECL calculation; recoverable amount = €120

ECL= €100 – €120 = – €20; as there is no reversal of provisions, ECL are set to zero.

Case 3:

Exposure of €100, previous ECL= €30; recoverable amount = €80

> ECL= €100 – €80 = €20; (partial) reversal of ECL is considered.

Cash flows are discounted using the original EIR in accordance with IFRS 9.

> **IFRS 9, Para. B5.5.44 (EU)**
>
> Expected credit losses shall be discounted to the reporting date, not to the expected default or some other date, using the effective interest rate determined at initial recognition or an approximation thereof. If a financial instrument has a variable interest rate, expected credit losses shall be discounted using the current effective interest rate determined in accordance with paragraph B5.4.5.

> **IFRS 9, Para. B5.4.5 (EU)**
>
> For floating-rate financial assets and floating-rate financial liabilities, periodic re-estimation of cash flows to reflect the movements in the market rates of interest alters the effective interest rate. If a floating-rate financial asset or a floating-rate financial liability is recognised initially at an amount equal to the principal receivable or payable on maturity, re-estimating the future interest payments normally has no significant effect on the carrying amount of the asset or the liability.

The total ECL/provisioning adjustment at debtor level (both positive and negative) should be used to report findings for each stratum of the sample. Results for multiple debtors in a group should be reported separately in the appropriate stratum. The results are used for the capital calculation as part of the AQR-adjusted CET1% calculation (both sampled and extrapolated). Please refer to Sections 6.6 and 9.5.1 for details.

4.6.1 Treatment of undrawn financial guarantees and loan commitments

These exposures are also covered by IFRS 9 and have specific rules to determine the ECL/provision amount incurred from the commitment

> **IFRS 9, Para. B5.5.30 (EU)**
>
> For undrawn loan commitments, a credit loss is the present value of the difference between:
>
> (a)   the contractual cash flows that are due to the entity if the holder of the loan commitment draws down the loan; and
>
> (b)   the cash flows that the entity expects to receive if the loan is drawn down.

IFRS 9, Para. B5.5.31 (EU)

An entity's estimate of expected credit losses on loan commitments shall be consistent with its expectations of drawdowns on that loan commitment, i.e. it shall consider the expected portion of the loan commitment that will be drawn down within 12 months of the reporting date when estimating 12-month expected credit losses, and the expected portion of the loan commitment that will be drawn down over the expected life of the loan commitment when estimating lifetime expected credit losses.

IFRS 9, Para. B5.5.32 (EU)

For a financial guarantee contract, the entity is required to make payments only in the event of a default by the debtor in accordance with the terms of the instrument that is guaranteed. Accordingly, cash shortfalls are the expected payments to reimburse the holder for a credit loss that it incurs less any amounts that the entity expects to receive from the holder, the debtor or any other party. If the asset is fully guaranteed, the estimation of cash shortfalls for a financial guarantee contract would be consistent with the estimations of cash shortfalls for the asset subject to the guarantee.

Accordingly, to measure the expected drawn exposure under the gone or going-concern approach/scenario, the bank team either uses reliable cash flow forecasts or loan contracts (e.g. under the two-step DCF approach) or applies the credit conversion factors stipulated in Article 166(10) of the CRR, based on the risk classifications indicated in Annex I of the CRR, to the nominal value of the commitment.

4.6.2   Identification of anomalies

There may be debtors for whom a projection of findings is not appropriate given their very special nature compared to other exposures in the same stratum. These debtors are flagged as anomalies and excluded from the projection of findings. This will be challenged by the NCA QA&TAT and the CPMO. While there is no specific cap on the number of anomalies, they are expected to be rare. Only confirmed anomalies may be excluded from projection of findings.

4.6.3   Gone-concern approach

The gone-concern approach assumes that the debtor's operating cash flows cease and the collateral is exercised. The analysis of collateral proceeds takes place at exposure level.

The bank team adjusts the future proceeds from collateral execution for liquidation costs and the lien structure. The loan's original EIR is used to discount the cash flows.

> **IFRS 39, Para. B5.5.55 (EU)**
>
> For the purposes of measuring expected credit losses, the estimate of expected cash shortfalls shall reflect the cash flows expected from collateral and other credit enhancements that are part of the contractual terms and are not recognised separately by the entity. The estimate of expected cash shortfalls on a collateralised financial instrument reflects the amount and timing of cash flows that are expected from foreclosure on the collateral less the costs of obtaining and selling the collateral, irrespective of whether foreclosure is probable (i.e. the estimate of expected cash flows considers the probability of a foreclosure and the cash flows that would result from it). Consequently, any cash flows that are expected from the realisation of the collateral beyond the contractual maturity of the contract should be included in this analysis. Any collateral obtained as a result of foreclosure is not recognised as an asset that is separate from the collateralised financial instrument unless it meets the relevant recognition criteria for an asset in this or other Standards.

The recoverable amount of the collateral proceeds at t = 0 is therefore defined as follows:

$$Recoverable\ amount$$
$$= Collateral\ share\ \%$$
$$* \sum_{t=0}^{T} \frac{(Liquidation\ proceeds_t - Liquidation\ costs_t)}{(1 + EIR)^t}$$

As a first step, the bank team estimates expected time to liquidation (*T*), $\{Liquidation\ proceeds_t\}_{t=0}^{T}$ and $\{Liquidation\ costs_t\}_{t=0}^{T}$. This is based on the bank team's experience, input from appraisers, the bank's collateral execution policies and bank data covering the two years preceding the AQR reference date. All methodology and parameter estimates are applied consistently across debtors but differentiated by collateral type and region.

$\{Liquidation\ proceeds_t\}_{t=0}^{T}$ are the cash inflows for the asset during the liquidation process and take account of both income generation (e.g. rent) and proceeds from its sale (including consideration of whether collateral perfection permits reasonable execution of collateral in a realistic timeframe) under the different scenarios. Proceeds from sale should be based on market value. Market values should be determined as described in the collateral valuation section, but should also include expected falls (but not rises) in market value in the period between observation and sale. The CPMO provides forward-looking indices for the baseline scenario to take account of expected falls in market values. For the adverse scenario, the indices

used should be chosen in line with the benchmark stress applied to LGD variables in the stress test. For any additional scenarios proposed by the bank team, assumptions for the indices used in calculations should be provided together with supporting documentation.

Where there has not been a new appraisal (e.g. because the collateral has not been revalued within the last 12 months), the last appraisal value is indexed forward from the date of the last valuation to the expected point of sale based on (potentially scenario-dependent) indices agreed with the ECB.

The bank team should also consider the recoverability of insurance and guarantees, weighing up the probability of the outcome – pay or not pay – for each policy/protection. As a rule of thumb, unfunded credit protection eligible under the CRR where the provider of the protection is rated at CQS 3 or above should be acceptable.

$\{Liquidation\ costs_t\}_{t=0}^{T}$ are the cash outflows incurred during collateral execution and the sale process. The bank team estimates these outflows for each year of the liquidation process. These costs should include law enforcement, bank team and other sale costs, as well as haircuts to market value. The market price haircut reflects the liquidity of the market and the liquidation strategy. It does not reflect fire sale conditions unless the anticipated liquidation strategy involves a fire sale. A "hold" strategy is not acceptable for real estate. If the plan is to sell with vendor finance, the present value of the discount given to the client on financing (vs market rates) should be included in the liquidation costs. The market price haircut may be zero for liquid and non-distressed collateral types, but is expected to be at least 10% in the following cases[37]:

- the collateral will be sold by auction;

- the collateral was foreclosed two years ago and has not been sold;

- the collateral is sold with vendor finance reflecting the net present value (NPV) loss from providing cheaper-than-market financing.

The bank team then analyses the lien structure to determine the *collateral share %*. The *collateral share %* should reflect the claims of other parties on the same collateral, as in the examples below.

If another creditor has a preferred claim on the collateral (i.e. the bank's claim is only second lien) that is greater than the recoverable value, the *collateral share %* is set to 0%.

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[37] If no market price haircut is applied for liquid and non-distressed collateral, the bank team needs to provide evidence that the collateral is really liquid and non-distressed and that the sale is not expected to give rise to any costs. Ideally, the bank will already have a binding offer from a third party to acquire the collateral.

If the bank's claim is first lien but pari passu with other creditors' claims, the *collateral share %* is equal to the contractually agreed share of the claim. If there is no such agreement and national insolvency law does not provide explicit guidance, the bank's share of exposure towards this collateral is used.

The bank team also reviews legal issues associated with collateral, such as the strength of collateral claims, where these are material to the individual impairment and provisioning review.

The bank team determines the present value of the cash flows by discounting the proceeds with the original EIR of the exposure. If there are several exposures against the same collateral, the average EIR of these exposures weighted with the *collateral share %* is used. Please refer to Section 4.6 for details.

The bank team adds the expected proceeds from the liquidation of the debtor's non-pledged assets. This is done in line with the guidance in Section 4.6.6.2. However, the result is expected to be de minimis.

Example

CRE exposure of €100. Under this scenario, the bank considers the likelihood of the collateral being sold under auction to be 100%.

The bank team estimates the time to liquidation (T) to be two years for the given liquidation strategy.

Liquidation costs are expected to be 5% of the appraisal value
in t = 1 and 10% in t = 2.

The bank holds a first lien claim but pari passu with another party (estimated claims €150). A further party has a second-lien claim that is not taken into account.

The *collateral share* % is therefore €100/(€100 + €150) = 40%.

The appraiser has valued the collateral at €240. The EIR of the exposure is 5%.

The collateral proceeds are:

$$\text{Collateral Proceeds}_0 = 40\ \% * \left(\frac{€\,240}{(1+5\%)^2} - \frac{€\,240 * 5\%}{(1+5\%)^1} - \frac{€\,240 * 10\%}{(1+5\%)^2} \right) = €73.80$$

Under the gone-concern outcome, the required ECL would be €100 − €73.80 = €26.20.

4.6.4   Going-concern approach

Under the going-concern approach, cash flows continue and can be used to repay financial debt to all creditors.

Collateral may also be exercised to the extent that this does not affect operating cash flows (e.g. premises pledged as collateral cannot be exercised without impacting cash flows, while stock or commodities pledged in connection with asset-based lending products cannot be sold without significantly impacting business operations, etc.). Where this is the case, the proceeds from the collateral are derived in line with Section 4.6.3 and added to the present value of the operating cash flows.

The first step is for the bank team to decide on the scope of the cash flow analysis. The bank team then estimates the present value of the operating cash flows.

> **IFRS 9, Para. B5.5.33 (EU)**
>
> For a financial asset that is credit-impaired at the reporting date, but that is not a purchased or originated credit-impaired financial asset, an entity shall measure the expected credit losses as the difference between the asset's gross carrying amount and the present value of estimated future cash flows discounted at the financial asset's original effective interest rate. Any adjustment is recognised in profit or loss as an impairment gain or loss.

The bank team has a choice of two methodologies for deriving the present value of operating cash flows[38].

4.6.4.1   Steady-state cash flow approach (standard approach)

Estimate the sustainable (steady-state) one-period operating cash flows of the debtor or group.

Convert to present value by multiplying the operating cash flows by a multiple to arrive at the sustainable level of debt for the bank.

Add any discounted recoveries from sales of collateral that is independent of operating cash flows.

Allocate present value to the bank[39].

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[38]   Note that "future credit losses that have not been incurred" should be included for the purposes of estimating "expected future losses" as referred to above.

[39]   The bank team considers other creditors' claims and their ranking relative to the bank's claim. Ranking is based on effective seniority and takes account of the implications of legal entity structure.

4.6.4.2 Two-step DCF approach (where operating cash flows can be reliably projected)

Forecast the operating cash flows of the debtor or group over an appropriate time horizon (term of the exposure with the shortest term or ten years, whichever is the shorter).

Add any recoveries from sales of collateral that is independent of operating cash flows to the cash flow projection.

Derive the terminal value of the debtor's cash flows in the same manner as the steady-state cash flow approach.

Allocate the cash flows to the bank and discount to present value[40].

The one step approach is typically used for sovereign, institutional and corporate exposures. The two-step approach is more suited to big-ticket asset finance such as project finance and shipping.

If an observable market price exists, this can be used as a practical expedient rather than performing a cash flow analysis. If the bank team chooses not to use the market price, even though it exists, the bank team nevertheless compares the results under the going-concern approach with those under the market price-based approach. If the recoverable amount under the going-concern approach is more than 10% higher than under the market price-based approach, this is flagged by the bank team and fully challenged by the NCA QA teams and the CPMO.

4.6.5 Treatment of groups of connected clients

Going-concern cash flow analysis should include cash flows from entities that are significantly economically interconnected. Significant economic interconnectedness is defined according to the Committee of European Banking Supervisors (CEBS) *Guidelines on the implementation of the revised large exposures regime[41,42]*. Entities that are identified by the bank as being part of the group but which the bank team does not consider to be interconnected should not be included in the cash flow analysis.

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[40] The bank team considers other creditors' claims and their ranking relative to the bank's claim. Ranking is based on effective seniority and takes account of the implications of legal entity structure.

[41] To be replaced by the EBA Guidelines on connected clients under Article 4(a)(39) of Regulation (EU) No 575/2013 applicable from 1 January 2019

[42] Non-exhaustive examples: the debtor has fully or partly guaranteed the exposure of another counterparty or pledged collateral in favour of another counterparty; the debtor relies heavily on another company in the group's distribution network to gain access to its clients; the group is one of the debtor's main clients; the debtor uses the group's infrastructure extensively in its value chain; the group and the debtor share the same brand.

4.6.6 Steady-state cash flow approach

The present value of cash flows to the bank for exposure i (*Cash flow value*$_{0,i}$) is derived as follows:

first estimate the present value of the debtor's cash flows by forecasting a one-period sustainable (steady-state) cash flow (CF$_S$) and applying a multiple (M);

then allocate the present value of the debtor's cash flows to the bank based on the effective seniority of each exposure.

4.6.6.1 Estimation of the present value of the debtor's cash flows

The present value (PV) of the debtor's cash flows is defined as

PV operating cash flows (debtor) = CF$_S$ * M.

One-period sustainable CFs are defined as follows:

CF$_S$ = EBITDA + Cash flow adjustment + Sustainability adjustment

The bank team applies the following general principles when forecasting CF$_S$:

CF$_S$ is forecast on a going-concern basis;

CF$_S$ is estimated on the basis of the debtor's financial statements.

The most recent information is regarded as the best basis for forecasting EBITDA. Accounts as of one year prior to the AQR reference date are acceptable. If no current information is available and it cannot be retrieved by the bank within a reasonable timeframe, the CF$_S$ is expected to be zero.

The information from the most recent management accounts and audited accounts should be used (where management accounts are available). The more conservative value is generally chosen.

4.6.6.1.1 Guidance for forecasting: EBITDA

The bank team derives EBITDA according to the following structure:

	Revenues
-	Cost of sales
-	Distribution costs
-	Administrative expenses excl. depreciation/amortisation
-	Payroll taxes
+/-	Other gains/losses
=	EBITDA

The bank team's forecasts are generally expected to be based on figures as of T_0 or T_{-1} snapshots. Where the bank team's estimates deviate from historical figures (e.g. adjustment for high one-off revenues), the bank team makes appropriate notes in the template provided to justify its assumptions.

As a first step, the bank team forecasts *revenues*. It then considers the effects on *cost of sales*, *distribution costs* and *administrative expenses excl. depreciation/amortisation*.

The bank team neutralises one-off positions included in other gains/losses as per the debtor's financial statements (on a best-efforts basis based on available information). Examples include:

- gains/losses from financial asset valuation;
- effects of changes in foreign exchange rates;
- positions typically reported under other comprehensive income.

This does not apply to frequent one-offs, e.g. a company that has one-off integration costs in each set of financial statements.

The bank team adjusts prior-year cash flows if there are known exceptional changes to cash flows, e.g. if the debtor has gone into liquidation.

4.6.6.1.2   Guidance for forecasting: cash flow adjustment

The bank team derives the *cash flow adjustment* according to the following structure:

-	Income tax expense
-	Owner's remuneration/"essential dividends"
-	Required capital expenditure (CAPEX)
=	Cash flow adjustment

All positions are generally expected to be derived from figures as of the AQR reference date or one year prior to it.

Income tax expense is defined as profit before income tax * effective income tax rate. The bank team estimates the effective income tax rate and profit before income tax as follows:

- The effective income tax rate is forecasted in line with typical income tax rates in the jurisdiction and the bank team's experience.
- Profit before income tax is defined as EBITDA – net interest expense – depreciation. Both net interest expense and depreciation will be constant in line with figures as of the AQR reference date or one year prior to it unless there are significant one-off effects (e.g. major depreciation of tangible assets due to a change in technology).

The bank team deducts *owner's remuneration/"essential dividends"* from cash flows. Examples include cases where the owner(s) of the firm require(s) a minimum payout to make a living, or where the controlling shareholder depends on part of the dividends to avoid default.

The bank team also deducts the minimum annual CAPEX required to maintain the operating cash flows. The bank team derives its estimate based on its experience and typical CAPEX levels in the industry in question.

4.6.6.1.3   Guidance for forecasting: sustainability adjustment

The bank team applies conservative adjustments to the cash flows – on a best-efforts basis – where the forecast based on prior-year data does not yet give rise to a sustainable level of cash flows due to financial accounting choices/methodology (best-efforts basis based on available information). For example, when reversals of provisions improve results, these effects are neutralised. Examples are:

- negative or very low funded pension scheme contribution (flow);

- negative or very low IFRS 9 provision (in particular for guarantees provided) and write-off flow for receivables.

As a general rule, the bank team applies the following **multiples M** to CF_S unless the bank team deems the multiples provided to be inappropriate in an individual case, in which case an explanation should be provided stating why they are inappropriate.

Multiples

Infrastructure	12
Utilities	10
Other exposures	6

These multiples are consistent with standard market practice and reflect the level of gearing of operating cash flows that can feasibly be achieved over a medium-term horizon while maintaining a debt service coverage ratio above 1. Where the bank team deems the multiples provided to be inappropriate in an individual case, it draws on market practice and its own experience to derive a debt capacity (not equity valuation) multiple that reflects the most likely outcome.

Multiples are expected to be similar within the same industry and the same geography, and are challenged by cross-validation as part of the QA process.

4.6.6.2 Allocation of cash flows to claims

To allocate the present value of operating cash flows to claims, the bank team derives the effective seniority ranking of a bank's claims for each of its exposures. The bank team then allocates the present value of cash flows as well as non-pledged cash and non-pledged assets to all claims based on the ranking.

The bank team derives the ranking for claims within financial debt, negative working capital, net tax liability and conservative adjustment. These are defined as follows:

- **Financial debt:** All borrowings, financial liabilities and minority interest.

- **Negative working capital:** Excess of trade and other payables over trade and other receivables and inventories; zero otherwise. Pledged assets are not deducted.

- **Net tax liability:** Excess of tax liability over tax assets (going concern); tax liability (gone concern); zero otherwise.

- **Conservative adjustment:** The bank team makes an adjustment – on a best-efforts basis – for claims that are not or not entirely reflected in the debtor's balance sheet due to accounting methodology or rules (e.g. finance leases with nGAAP debtors, inadequate stock of pension scheme contribution, guarantees provided/contingent liabilities without or with insufficient provision).

Table 67

Claims and debtor asset categories

The bank team analyses the debtor's balance sheet and all available information about seniority and legal structure to derive the effective seniority of all these claims. If no information is available, a conservative estimate of effective seniority is made. Claims need to be ranked according to effective seniority, taking the following aspects into account (non-exhaustive list):

- residual maturity of claims;

- some debtors receive preferential treatment in a given jurisdiction (e.g. employees, tax authorities);

- the debtor's legal structure may result in certain exposures having effective seniority over others (e.g. a loan to an operating company within a group may have a preferred claim on that operating company's cash flows).

In going-concern cases, consideration should be given as to whether equity and subordinated holders can realistically be fully neutralised, or whether some value does need to be attributed to them.

Seniority analysis can also be based on a bank's internal papers, restructuring agreements, reviews, etc., where these seem reliable. The bank team can also be guided by the bank's internal assumptions, subject to appropriate challenge.

As a next step, the bank team determines the total amount for allocation, which is defined as

AA = PV operating cash flows (debtor) + Non-pledged cash + Non-pledged financial assets

The bank team then allocates *AA* to each exposure according to the effective seniority ranking. The present value of total cash flows is allocated to total net claims according to their effective seniority ranking. For claims of the same rank, a pro-rata allocation should be assumed.

The *cash flow value*$_{0,i}$ for exposure i is therefore derived as follows:

Cash flow value$_{0,i}$ = min (max (AA – Preferred claims$_i$, 0)/(Exposure$_i$ + Pari passu claims$_i$), 1) * Exposure$_i$

Where

- *Exposure*$_i$ is the exposure amount of the bank for exposure i;

- *Preferred claims*$_i$ are claims to the same debtor with a high (better) effective seniority ranking;

- *Pari passu claims*$_i$ are claims to the same debtor with the same effective seniority ranking.

The recoverable amount is the c*ash flow value*$_{0,i}$ plus the *recoverable amount from collateral* that is not central to cash flow generation. The *recoverable amount from collateral* is derived in line with the guidance in Section 4.6.3.

Example

Exposure i, €15, seniority ranking 2

Claims of other creditors are broken down as follows:
€25 are more senior, €15 are pari passu, €45 are less senior.

The amount for allocation (€35) is distributed to seniority ranking 1 first. The remaining €10 is then shared pro rata between all exposures of seniority ranking 2 (i.e. €5 + €5).

Exposures ranked by effective seniority	Amount for allocation	*Cashflow Value$_0$*
Seniority rank 1 — 25	35	25
15		5
Seniority rank 2 — 15 (Bank A exposure i)		5 (Bank A *Cashflow Value$_{0,i}$*)
Seniority rank 3 — 45		0
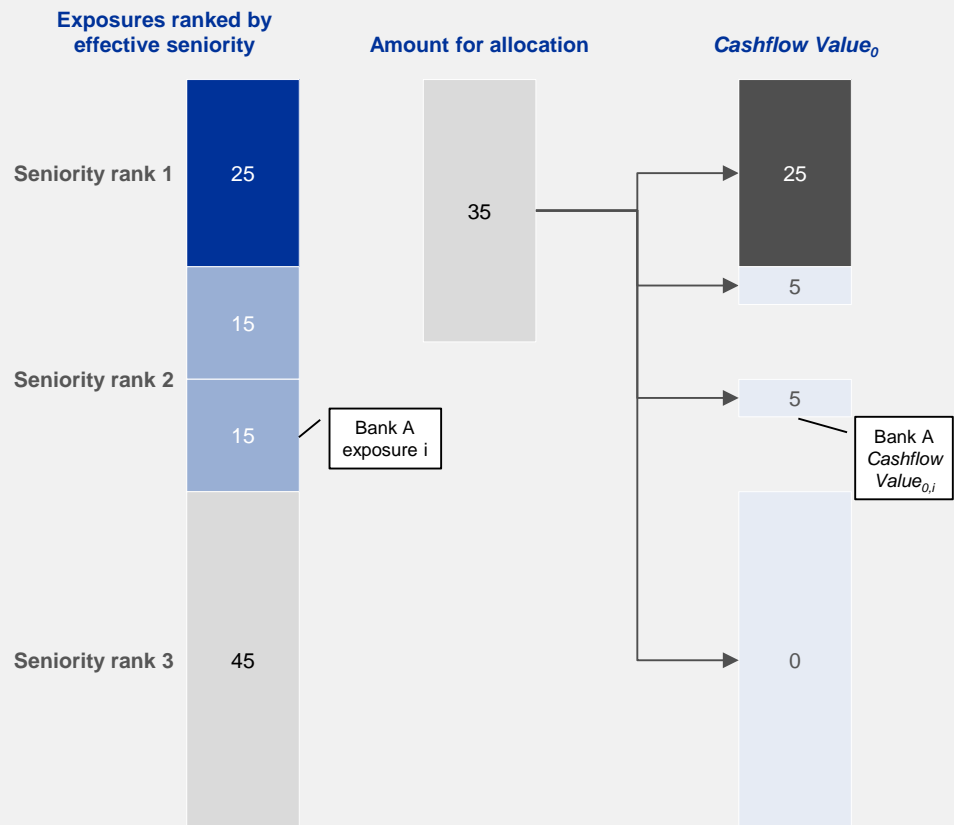
Seniority ranking 3 exposures get zero allocation.

The debtor has pledged governments bonds worth €3 in favour of exposure i.

The recoverable amount is therefore €5 + €3 = €8.
The required impairment is €15 – €8 = €7.

4.6.7   Two-step DCF approach

The present value of cash flows to the bank for exposure i (*Cash flow value$_{0,i}$*) is derived as follows.

- First estimate the **debtor's cash flows** by conducting a DCF analysis.

- Then forecast the **cash flows to the bank** for each exposure based on the effective seniority. Cash flows are discounted to obtain the present value.

The bank team conducts a DCF analysis only where reliable cash flow projections are available. Where these cannot be obtained, the one-period cash flow approach is to be used. Cash flow projections are challenged in the QA process.

The bank team follows the widely used two-step DCF approach to estimate the present value of the debtor's cash flows: (1) a period-by-period cash flow analysis followed by (2) an estimation of the terminal value.

- The length of the projection in step 1 should be restricted to the length of the reliable cash flow projection or the term of the shortest-term non-revolving exposure to the bank, whichever is the shorter, but should be at least three years. The length of the projection should not exceed ten years. Cash flows from the liquidation of collateral not central to the cash flows are derived according to the guidance in Section 4.6.3 and added to those cash flows (i.e. drawing upon asset valuation as described in Section 5 unless there is a pre-agreed forward sale price).

- The terminal value (step 2) should be calculated by deriving sustainable one-period cash flows at the end of the projection and applying a multiple as described in the steady-state cash flow approach, or by assuming a gone-concern situation.

For each period, cash flows are then allocated to each claim of all creditors as described in Section 4.6.6.2. Cash flows allocated to the claims of the bank are discounted to determine the present value using the EIR for the relevant exposure to the debtor.

IFRS 9, Para. B5.5.33 (EU)

For a financial asset that is credit-impaired at the reporting date, but that is not a purchased or originated credit-impaired financial asset, an entity shall measure the expected credit losses as the difference between the asset's gross carrying amount and the present value of estimated future cash flows discounted at the financial asset's original effective interest rate. Any adjustment is recognised in profit or loss as an impairment gain or loss.

Example

Exposure of €200 to project debtor X. The EIR is 7% and the residual maturity is eight years. The loan is part of a syndicated loan of €800 in total. The project is still in development and needs two more years of investment. The outstanding committed credit line of €200 (bank A share of €50) is expected to be drawn in full over the two years to cover the required investment.

During forbearance measures, the lead manager of the syndicate has produced an updated cash flow projection. The project's liquidation value is expected to be €400 at T = 10. The bank team verifies the assumptions and considers the projections to be the most likely outcome.

T	1	2	3	4	5	6	7	8	9	10
Operating CF	-100.0	-100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Liquidation value										400.0
Senior creditors			100.0	100.0						
Bank A	-25.0	-25.0			25.0	25.0	25.0	25.0	25.0	125.0
Other syndicate banks (pari passu)	-75.0	-75.0			75.0	75.0	75.0	75.0	75.0	375.0

The bank team estimates the cash flows to each creditor according to effective seniority. The social security debts are expected to be repaid first, then the banking syndicate.

The recoverable amount (present value of positive flows to bank A discounted at 7%) is €141.70. The total exposure is €200 + €45.20 (present value of future drawn amounts) = €245.20.

Total ECL are €245.20 – €141.70 = €103.50 (of which IFRS 9 impairment of €103.50 * €200/€245.20 = €84.40 and IAS 37 provision of €103.50 * €45.20/€245.20 = €19.10)

4.6.8 Observable market price expedient

Bank teams may derive the present value of cash flows using an observable market price. In such cases the going-concern approach analysis described in the previous sections is replaced by the market price expedient described in this section.

IFRS 9, Para. B5.5.35 (EU)

An entity may use practical expedients when measuring expected credit losses if they are consistent with the principles in paragraph 5.5.17. […]

IFRS 9, Para. 5.5.17 (EU)

An entity shall measure expected credit losses of a financial instrument in a way that reflects:

1. an unbiased and probability-weighted amount that is determined by evaluating a range of possible outcomes;

2. the time value of money; and

3. reasonable and supportable information that is available without undue cost or effort at the reporting date about past events, current conditions and forecasts of future economic conditions.

The bank team takes the maturity of the exposure into account and ensures the applicability of the market price to the exposure by reviewing the following criteria:

- issuer/debtor;

- effective seniority;

- current price available;

- embedded options;

- collateralisation of the traded instrument;

- other criteria in line with standard IFRS/NGAAP practice.

If the bank team chooses not to use an available market price, the bank team nevertheless compares the results under the going-concern approach with those under the market price-based approach. If the recoverable amount under the going-concern approach is more than 10% higher than under the market price-based approach, this is flagged by the bank team and fully challenged by the NCA QA teams and the CPMO to ensure that DCF assumptions are not overly optimistic.

Example

Exposure of €100 to debtor X. The EIR is 7% and the residual maturity is two years

Several of debtor X's bonds have quoted prices. The bank team retrieves the following information from the market data provider:

	Bond X	Bond Y	Bond Z
Coupon	8%	8%	12%
Residual maturity	1Y	5Y	2Y
Dirty price/nominal	92.0%	60.0%	55.0%
YTM	17.4%	22.0%	54.0%
Seniority	Senior	Senior	Junior

The bank team excludes the junior bond from the following analysis as the exposure is senior unsecured.

The interpolated yield to maturity for two years is 18.5%. The estimated value of the loan is the contractual cash flow of the loan, discounted at 18.5%, which equates to 82.1% of the nominal.

Based on the market price, the required impairment would be €100 – €82.10 = € 17.90.

Note: This is only an example of how observable market prices can be used. The bank team will need to determine the best practical valuation method in each specific case.

4.7 Implications of findings for capital calculation and provisioning going forward

Once the credit file review of the sample has been completed, a list of findings and adjustments will be available for each sampled file. In the event of any doubt, deviations should be discussed with bank management to ensure that information central to the findings has not been missed or misunderstood.

The final findings for the sample will ultimately be communicated to the bank, which will be expected to incorporate them in its future accounts (to the extent that deviations still exist) following completion of the CA (no findings will be disclosed apart from for the purposes of clarifying deviations).

The specific findings from the sample should also be translated into generalised findings that might have a wider bearing on capital and provisioning calculations going forward (e.g. higher future provisions due to a more conservative provisioning policy). These may include:

- changes to policies (e.g. frequency of collateral valuation);

- improvements to processes (e.g. for impairment classification);

- changes to analytical approaches (e.g. distinction between gone and going-concern DCF analysis);

- improved data quality.

Please also refer to Section 9.6 for further examples from other areas.

4.8 Outputs

The overall objectives of the credit file review are as follows:

- to identify areas where the bank does not apply its own policies (or where these are minimally defined for the purposes of the AQR);
- to quantify deviations to allow projection of findings and determination of an AQR-adjusted CET1%;
- to identify misclassifications of exposures, supplementing findings of the DIV workblock;
- to identify any required changes to bank processes and policies.

The following outputs need to be produced for this workblock:

Table 68

Outputs for credit file review 144

Workblock	Output
4. Credit file review	Complete T4B. Credit file review findings template
	O4B PowerPoint presentation describing any remedial action the bank should take as a result of the credit file review

5 Collateral and real estate valuation

As part of the credit file review, physical asset valuations (e.g. real estate, aircraft, ships, artwork) used to assess provisions or the carrying values of on-balance-sheet assets must be checked to ensure they are appropriate. This is achieved by updating collateral values – either by having collateral revalued by a third-party expert or by updating a recent independent external market valuation. This section describes the process and methodology for updating collateral valuations

5.1 Summary of the approach

All physical assets should be valued on the basis of market value, i.e. the estimated amount for which an asset or liability should be exchanged on the valuation date between a willing buyer and a willing seller in an arm's length transaction after proper marketing and where the parties had each acted knowledgeably, prudently and without compulsion.

The following appraisals may be used, otherwise an independent external valuation should be carried out (subject to the materiality constraints described in Section 5.4).

- An existing market valuation of the asset in question carried out by an independent external appraiser no earlier than one year prior to the AQR reference date. Such assets may be indexed to the AQR reference date based on indices proposed by the NCA and agreed with the CPMO.

- An existing market valuation of the asset type in question carried out by an independent internal appraiser no earlier than one year prior to the AQR reference date, subject to the adjustment described in Section 5.4.

The bank team that the NCA hires to carry out the wider credit file review may have sufficient expertise to carry out the valuation, though in exercises of this nature the appraisal can typically be handled more efficiently by a specialist firm. To ensure an efficient process, the NCAs provide bank teams with a list of specialist firms to be used.

Real estate should be valued in line with European Standards EVS-2012 (Blue Book) and other international standards such as the Royal Institute of Chartered Surveyors (RICS) guidelines, with EVS2012 taking precedence in the event of any conflict (for the avoidance of doubt, this should be considered to apply throughout the document). A full report (e.g. RICS report) is not required; desk-based valuations are expected to be carried out. Internal inspections are not expected. Drive-by inspections may be carried out if the bank team feels that a desk-based valuation is not sufficient. In some jurisdictions this may be considered as a "plausibility check" on valuations rather than a fully fledged valuation. Any third-party revaluation should be carried out under the instruction of the NCA.

Shipping and aviation valuations should be based on industry benchmarks for the type of asset, adjusted for distortions in industry benchmarks created by parties that transact above market value (e.g. manufacturers looking to defend residual values) and where relevant for unusual asset characteristics. For vessels/aircraft on long-term charter to investment-grade counterparties, a DCF valuation may be used. All valuations should be in euro. Any third-party revaluation should be carried out under the instruction of the NCA.

Other, more esoteric physical assets that form a material amount of the collateral for a particular debtor (e.g. artwork, cars, rolling stock, etc.) should also be valued by an independent external appraiser, though this may be one appointed by the bank. In such circumstances, however, the purpose of the valuation must be made clear to the third-party appraiser.

Where an NCA considers that the valuation approach used as standard in its country is more conservative than that implied by a market valuation, the prevailing valuation approach may be applied. Before allowing local approaches, the NCA will need to demonstrate in writing to the ECB's satisfaction that the local approach is conservative in all relevant cases. For the avoidance of doubt, the mortgage lending value may only be used for real estate in cases where this is explicitly lower than the market value in all cases.

The market valuation of collateral is to be performed and recorded prior to any adjustments made within the provisioning calculation.

Where appraisal results do not differ by more than 5% of indexed values as of the AQR reference date, these differences can be ignored in further analysis.

Where currency conversion is required, the exchange rates used for financial reporting as of the AQR reference date are used.

5.2   Indicative timeline

Table 69

Indicative timeline for collateral and real estate valuations

Task	Indicative date
Discussion between ECB and NCA on valuation assumptions	Week 6
Commence revaluation of on-balance-sheet assets	Week 6
Collateral revaluation process for priority debtors	Week 8-week 11
Commence collateral revaluation process for remaining sample	Week 11
Complete collateral revaluation	Week 18

5.3 Illustrative models, parameter sheets and templates

The following illustrative models, parameter sheets and templates are relevant to this workblock:

Table 70

Template for revaluation of physical assets

Template	Summary of contents	Frequency of submission to CPMO
T5 Collateral and real estate valuation template	Template for capturing information on collateral revaluations	Weekly submission of WIP template

5.4 Required operating process for revaluation

The process for carrying out collateral valuation is as follows:

NCAs are asked to work with third-party appraisers to provide transparency on key assumptions (yield, valuation per unit area, discount rates for hope value, etc.) for the NCA's home market. In the case of non-SSM markets, where banks have material real estate portfolios the bank team may provide this information if it has the necessary internal experience and third-party support is not feasible in the tight timescale set. This may also apply for specific SSM markets in exceptional cases. Geographies accounting for less than 5% of the carrying amount of foreclosed or collateral assets for a particular portfolio can be ignored. NCAs should ensure these assumptions are tailored to local markets, up to date, comprehensive and appropriate – support from relevant third parties may be required if the NCA does not have the necessary internal experience. The output should take the form of a presentation to the CPMO by Week 7, which should cover the following topics:

- if relevant, justification of the use of local valuation methods rather than RICS/EVS market value (i.e. demonstrating conservatism);

- ranges of benchmark yield assumptions by relevant dimensions (property type (i.e. office, retail, etc.), region, quality of property, ship type, etc.);

- ranges of benchmark valuation per unit area by relevant dimensions (property type (i.e. urban land without planning permission, agricultural, office, retail, etc.), region, quality of property);

- ranges of discount rates and time horizons to be applied for hope value[43] by relevant dimensions;

- benchmark ranges as required for the gone-concern approach in the credit file review (e.g. time to liquidation);

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[43] Hope value refers to the potential increase in value achieved by investing in improving a property's aspect, e.g. by completing development of a partially completed office building.

- at the NCA's discretion, market-specific guidelines on incorporating property-specific features through, for example, adjustments of yields (e.g. the use of automated valuation tools, property rating models, etc.).

Reappraisal of collateral and foreclosed assets is not required if the assets in question have been appraised within the last 12 months by an independent external party using a valid market value approach at a date no earlier than one year prior to the AQR reference date. Such assets may be indexed to the AQR reference date based on indices proposed by the NCA and agreed with the CPMO.

In the case of collateral and foreclosed assets, the sale price may also be used if the assets in question were sold between the AQR reference date and the beginning of the exercise. The bank team is responsible for verifying whether this is the case before any need for reappraisal is dismissed.

Reappraisal of the collateral with the smallest value for each debtor/economic group is also not required if the assets in question have been appraised within the last 12 months by an independent internal appraiser using a market value approach at a date no earlier than one year prior to the AQR reference date, subject to the following exclusions:

- If an independent internal valuation is available, at least 50% of the collateral (by value of collateral) for each debtor must be valued by an external appraiser.

- Where external valuations are found to be more than 5% below internal valuations, a haircut is applied to the independent internal valuation of collateral for which no external appraisal is available. The haircut should be equal to the level of correction applied to the collateral items that have been revalued by an external appraiser.

Where property valued by an independent internal appraiser is selected to be valued by an external appraiser, a check should be performed after the first 50 properties in a portfolio have been valued. If the average external valuation is greater than 97% of the indexed internal valuation, no further external valuations are required and the internal valuations may be accepted.

For the avoidance of doubt, an indexation is not a new valuation.

No revaluations provided by the bank after the submission of the loan tape can be considered valid for the exercise.

The operating process for revaluing collateral for the credit file review should be as follows:

- Banks are asked to complete a focused data request on debtors and the respective collateral in the sample (see template T4A and Section 4.4);

- Collateral items for review need to be selected by the bank team and should relate specifically to the debtors in the sample. For debtors in the sovereign, institutional and corporate AQR segments, collateral revaluation is only required if there is evidence of credit-impairment. If an independent internal valuation is

available, at least 50% of collateral items (by value) relating to a debtor should be reappraised by a third party, and all collateral items worth > €10 million should also be reappraised. If an independent internal valuation is not available, at least 90% of collateral items (by value) relating to a debtor should be reappraised by a third party, and all collateral items worth > €1 million should also be reappraised. Valuations should focus on the most valuable items. Collateral items with a recent valuation (see conditions in the paragraphs below) count towards revalued items.

- After items have been selected for review, collateral needs to be allocated to the third-party appraiser appointed by the relevant NCA (if not carried out by the bank team performing the wider review). The bank team needs to provide the relevant basic information required by the appraiser to carry out the appraisal as soon as is feasible after the loan sample has been selected. The bank team then needs to provide access to follow up information/individuals within the bank to allow the appraiser to complete the review.

- The appraiser provides the results by completing a line for each item in template T5. For some items a report needs to be provided as additional justification (see Section 5.6.2).

Operating process for revaluing foreclosed assets:

- Banks are asked to complete the relevant fields in template T5 (marked as to be filled by the bank).

- The bank team selects a sample of on-balance-sheet foreclosed real estate for reappraisal as part of the fair value exposures review. Geographies accounting for less than 5% of the carrying amount of foreclosed assets can be ignored. The sample should include the following:

    - the top 10 assets (by carrying amount) in each of the following property classes (where they exist): residential property; commercial: income-producing; commercial: in development; land;

    - a random sample of 100 properties not included in the above (to the extent that 100 exist).

- If the reappraisals are significantly (more than 10%) lower on average than the bank's valuation, the bank should be required to have the entire foreclosed real estate portfolio reappraised by an independent external appraiser following completion of the CA.

- The operating process for foreclosed assets is otherwise identical to the process for the credit file review (last two bullet points).

If the appraiser is a different party to the bank team carrying out the wider review, they need to feed the results back to the bank team so that provisioning deviations can be determined and level 2/3 asset valuations can be adjusted.

Multiple properties in the same building may be valued in aggregate where appropriate.

Where appraisal results are within 5% of the indexed values as of the AQR reference date, the differences may be ignored in subsequent analysis.

5.5   Information required for appraisal

Banks are asked to complete a focused data request on debtors and the respective collateral in the sample (template T4A). Banks also need to provide the bank team with a list of foreclosed assets for sampling.

The bank needs to provide this basic information to the bank team (and thus to the appraiser). To avoid a two-stage process, the bank also provides the actual collateral documentation as part of the submission of data for the credit file review.

If a bank is unable to provide the appraiser with the minimum information required for valuation, a value of 0 is attributed to the collateral item.

5.6   Real estate valuation approach

Real estate that has been revalued within the last 12 months by an independent external party using a market value approach may be indexed to the AQR reference date based on indices proposed by the NCA and agreed with the CPMO.

The remainder of this section focuses on how real estate should be revalued if it has not been revalued by an independent external party within the 12 months before the AQR reference date and the asset needs to be revalued for the purposes of the exercise.

Where real estate has not been revalued within the last 12 months using a market value approach, it should be valued in line with European Standards EVS-2012 (Blue Book) and other international standards such as the RICS guidelines. More specifically, real estate should be valued on the basis of market value. Market value is defined as the estimated amount for which an asset or liability should be exchanged on the valuation date between a willing buyer and a willing seller in an arm's length transaction after proper marketing and where the parties had each acted knowledgeably, prudently and without compulsion. All valuations should be in euro. Risk premia should reflect the fact that valuations are in euro, i.e. the discount rates used in hope value calculations should reflect local market risk premia.

Valuations on the basis of depreciated replacement cost are not permitted: an alternative approach is described below to cover situations where this approach may have been applied. Valuations on the basis of net income attributable to the property (e.g. net income for a factory rather than the rental income) are also not permitted: in situations where this approach may have been applied, the appropriate provisioning

level should be assessed using a going-concern cash flow-based approach (see the section on the credit file review).

Where an NCA considers that the valuation approach used as standard in its country is more conservative than that implied by an RICS/EVS market valuation, the prevailing valuation approach should be applied. Before allowing local approaches, the NCA will need to demonstrate in writing to the ECB's satisfaction that the local approach is conservative in all relevant cases. For the avoidance of doubt, the mortgage lending value may only be used in cases where this is explicitly lower than the market value.

Valuations are carried out on a "desk" basis without the benefit of internal inspection, but taking the property's specific location and external attributes into account. Where relevant, this may involve automated valuation approaches for residential and small-ticket commercial (i.e. < €1 million valuation) properties. The quality of the location, construction and allocation of areas should be taken into account. In certain cases a drive-by inspection may be requested at the bank team's discretion.

NCAs are asked to work with third-party appraisers to provide transparency on key assumptions (yield, valuation per unit area, discount rates for hope value, etc.) for the markets relevant to the banks under their supervision. This should take the form of a presentation to the ECB by Week 7 covering the following topics for both the home market and for non-SSM markets where banks under the NCA's supervision have selected material real estate portfolios:

- if relevant, justification of the use of local valuation methods rather than RICS/EVS market value (i.e. demonstrating conservatism);

- benchmark rental yield assumptions by relevant dimensions (property type (i.e. office, retail, etc.), region, quality of property) (see Section 5.6.1.1);

- benchmark valuation per unit area by relevant dimensions (property type (i.e. urban land without planning permission, agricultural, office, retail, etc.), region, quality of property) (see Section 5.6.1.2);

- discount rates and time horizons to be applied for hope value by relevant dimensions (see Section 5.6.1.3).

- other relevant factors for consideration in the credit file review (e.g. time to liquidation)

The ECB will provide feedback on these assumptions to ensure alignment across regions. This may involve challenging third parties to justify assumptions vis-à-vis other similar markets.

5.6.1   Decision tree for deciding valuation approach

The decision tree below describes how market values should be assessed for the purposes of the AQR:

Figure 6
Decision tree for valuation purposes
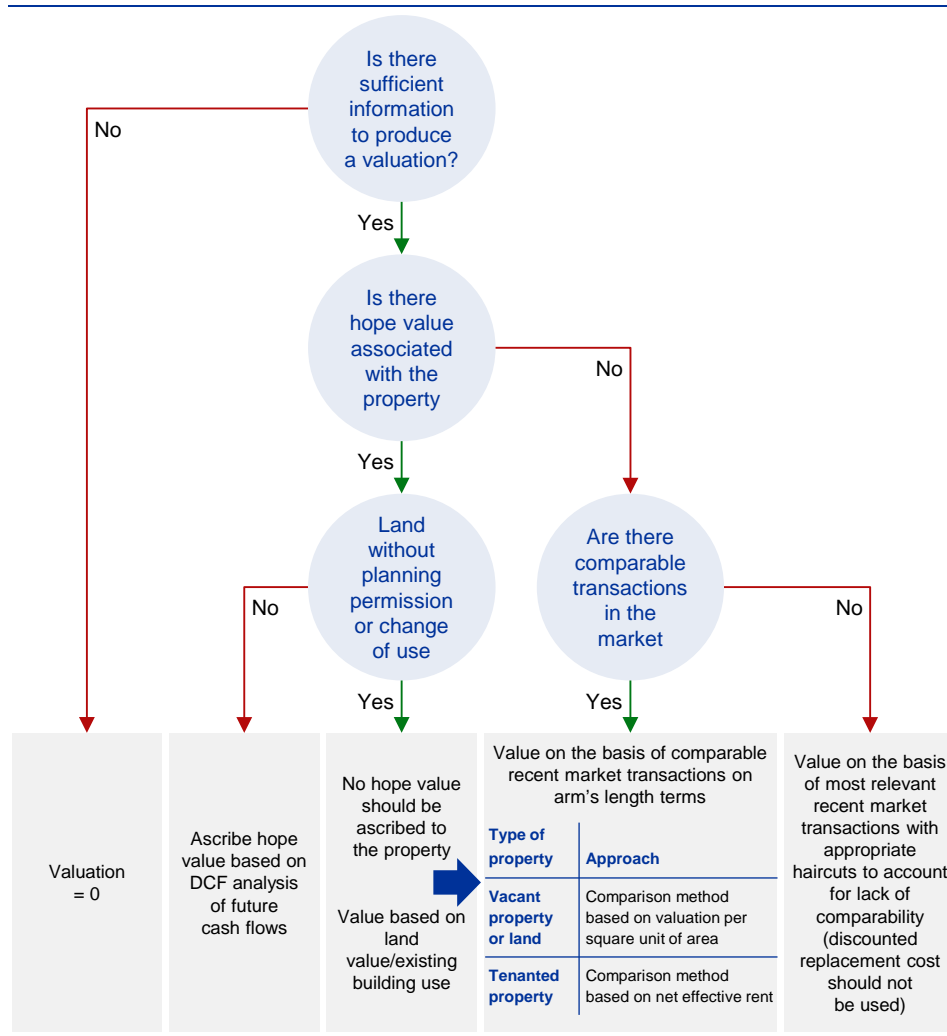
The minimum information required to carry out a valuation must be available, but not all data points are required in each case (e.g. actual rental income is required for tenanted property but not for vacant property or land). If the minimum required information cannot be provided, the valuation is 0.

Granular property price indices are not available for many small regions. In these circumstances the most appropriate index may be used to update recent external (and where relevant internal) valuations. A haircut of 20% (as per the decision tree above for situations where there are no comparables) is not required.

5.6.1.1   Comparable-based valuation based on net effective rent

Valuation based on net effective rent is to be used when a long-term rental agreement is in place (i.e. > 5 years) and/or the appraiser deems the current rental agreement to be consistent with market conditions.

Valuation based on net effective rent relies on two key parameters:

- yield;

- net effective rent.

The valuation is simply the net effective rent divided by the yield. The following aspects are taken into account:

- for mixed properties, the valuation may be carried out based on a "sum of the parts", reflecting the difference between the rent and yield for each part;
- for leasehold properties, the valuation must be adjusted to reflect the value of the freehold (i.e. the value of the freehold must be deducted to arrive at the value of the leasehold property).

5.6.1.1.1   Yield

The yield should be determined on the basis of similar market transactions that reflect the specifics of the asset, including:

- the risks associated with the rental agreement, in particular the credit quality of the tenant;

- the characteristics of the surrounding area, and the availability of communications and facilities which affect value;

- the characteristics of the property (dimensions and areas of the land and buildings);

- the construction of any buildings and their approximate age;

- the uses of the land and buildings;

- the apparent state of repair and condition;

- environmental factors such as abnormal ground conditions, historic mining or quarrying, coastal erosion, flood risks, proximity of high-voltage electrical equipment;

- contamination, e.g. potentially hazardous or harmful substances in the ground or structures on it;

- hazardous materials such as potentially harmful substances present in a building or on land;

- any physical restrictions on further development, if appropriate.

NCAs will provide the ECB by Week 7 with the yield ranges expected to be used in the analysis. They will return the actual yield ranges applied for the sample to the ECB together with the interim and final submissions of template T5 (collateral valuation template). The level of detail required for the yield ranges is shown below:

Table 71

Template for feeding back yield benchmarks (in %)

	Region 1 urban		Region 1 rural		Region 2 urban	
	Primary	**Secondary**	**Primary**	**Secondary**	**Primary**	**Secondary**
Single-dwelling residential house						
Single-dwelling residential apartment						
Multi-family home						
Social housing						
Industrial						
Office						
Retail						
Agriculture						
Other land (no planning permission)						
Other land (with planning permission for development)						

5.6.1.1.2 Approach for determining net effective rent

The approach for determining net effective rent must adjust for rent-free and incentive periods and rental growth using a DCF approach. Net effective rent should be determined based on the total length of the agreement, not the remaining length. Any additional proceeds from over-rental should also be taken into account. The approach is illustrated in the example below. Where the appraiser deems that the current rental agreement is inconsistent with market conditions, this is reflected in the valuation.

Table 72

Illustration of net effective rent calculation

Headline rent	**€100,000 p.a.**
Length of agreement at origination	10 years
Rent-free period at origination	First 21 months (of 10-year term)
Capital contribution at origination	€50,000
Market yield (given nature of the contract)	7%
Present value of headline rent minus capital contribution (at 7% yield)	€516,390
Net effective rent (equivalent rent over ten years with no capital contribution or rent-free period)	€70,466 p.a.

5.6.1.2 Comparable-based valuation based on unit of area

For vacant properties or properties with short-term rental agreements that are out of line with market rents, the asset is valued on the basis of comparable transactions normalised for area. Valuation based on unit of area relies on two key parameters:

- area of the property;

- valuation per unit of area.

The valuation is simply the valuation per unit area multiplied by the area.

For mixed properties, the valuation may be carried out based on a "sum of the parts", reflecting the difference in the valuation per unit area in different parts of the property. For leasehold properties, the valuation must be adjusted to reflect the value of the freehold (i.e. the value of the freehold must be deducted to arrive at the value of the leasehold property). Only the property size with potential value is relevant, so the property size can be assimilated to the usable size.

The valuation per unit area should be determined on the basis of similar transactions that reflect the specifics of the asset, including similar factors to those described in the section on yield. As above, NCAs should provide CPMO with the expected assumptions by Week 7, followed by the actual assumptions together with the interim and final submissions of template T5 (collateral valuation template).

Table 73

Template for feeding back valuation per unit area benchmarks (m^2)

	Region 1 urban		Region 1 rural		Region 2 urban	
	Primary	**Secondary**	**Primary**	**Secondary**	**Primary**	**Secondary**
Single-dwelling residential house						
Single-dwelling residential apartment						
Multi-family home						
Social housing						
Industrial						
Office						
Retail						
Agriculture						

5.6.1.3   Valuation reflecting hope value

As discussed above, no hope value is attributed to land without planning permission or change of use.

In the case of land with planning permission or ongoing development, hope value may be ascribed based on a DCF analysis of expected future cash flows if a reasonable expectation of demand for the development can be demonstrated. If this is not possible, the property should be valued on the basis of comparable land transactions.

The DCF valuation involves projecting the cash flows from sales following development of the land (net of construction costs and any required infrastructure such as roads, utilities, etc.). Cash flows are projected on a conservative basis reflecting a realistic development timescale and taking appropriate consideration of

the likely future demand for the development. A simplified illustrative example is shown below:

Table 74

Illustrative example of valuation based on DCF analysis for a residential property development

Year	1	2	3	4	5	6	Total
Stage of development	Mgmt	Urban	Urban	Construct	Construct	Sale	
Number of square metres sold						100,000	
Valuation per square metre (€/m^2)						1,250	
Cash flow (€million)	-5	-10	-10	-15	-15	120	65
Discount rate	17%	17%	17%	17%	17%	17%	
Discount multiple	0.83	0.69	0.57	0.47	0.39	0.33	
DCF	(4.2)	(6.9)	(5.7)	(7.1)	(5.9)	39	9.4

The discount rate used for the DCF analysis should be based on the appraiser's experience of the market. Each NCA in Europe will be asked to propose a set of discount rates (across the dimensions below) for all relevant countries by Week 7 for the AQR of relevant banks under their supervision, following input from third-party experts. CPMO will verify the parameters before valuations begin:

Table 75

Minimum risk premia (%)

Minimum risk premia	Months for development of the land (including sale)			
	<40	<80	<120	>=120
Social housing/council housing for first residence	???	???	???	???
Residential housing (first homes)	???	???	???	???
Residential housing (second homes), hotels, offices, commercial, elderly care homes or student halls of residence	???	???	???	???
Industrial, logistics, parking	???	???	???	???

As a guide, benchmark discount rates are provided below:

Table 76

Minimum risk premia benchmarks

Minimum risk premia	Months for development of the land (including sale)			
	<40	<80	<120	>=120
Social housing/council housing for first residence	8%	9%	10%	11%
Residential housing (first homes)	10%	11%	12%	13%
Residential housing (second homes), hotels, offices, commercial, elderly care homes or student halls of residence	12%	13%	14%	15%
Industrial, logistics, parking	14%	15%	16%	17%

5.6.1.4 Valuation without comparables

Given the scope of the exercise, it is considered unfeasible to produce valuations on the basis of depreciated replacement cost with a reasonable level of accuracy and conservatism. As a result, if a property has no immediate comparables and no net income can be attributed to it (i.e. a situation where going-concern cash flow-based provisioning would be appropriate), the appraiser is asked to apply the closest available comparable with an additional discount of 20% to reflect the inherent illiquidity of the property. The 20% is a benchmark to be used unless there is a strong reason for a higher discount.

5.6.2 Structure of report

The appraiser is required to populate a table with a line for each property valued covering the following topics:

- debtor ID;

- collateral ID;

- subject of the valuation;

- interest to be valued;

- type of asset and how it is used, or classified, by the counterparty;

- valuation date;

- method used (comparable, hope value DCF, income);

- property area;

- total net effective rent (if available);

- average yield applied (if relevant);

- average valuation per m^2;

- (if hope value attributed) type of development, completed value and time to completion;

- (if net effective rent method) discount rate applied;

- disclosure of any material involvement, or a statement that there has been no previous material involvement;

- identity of the appraiser responsible for the valuation;

- any assumptions, special assumptions, reservations, special instructions or departures;

- statement setting out the valuation approach and reasoning;

- opinions of value in figures and words.

5.7   Shipping and aviation

Shipping and aviation assets should be valued using the same market value approach as real estate, i.e. on the basis of market value at time of sale. Market value is defined as the estimated amount for which an asset or liability should be exchanged on the valuation date between a willing buyer and a willing seller in an arm's length transaction after proper marketing and where the parties had each acted knowledgeably, prudently and without compulsion.

Market value should be based on industry benchmarks for asset values by type such as Clarkson for shipping and Avitas for aviation. For aviation, particular emphasis should be placed on the model and age of the aeroplane and the specifics of the engine and fuselage. For shipping, the focus should be on the type, size and age of the vessel. It is critical that the reported values from these benchmarks should not be used directly. The specifics of the asset in question should instead be taken into account, including crucially:

- Adjusting for specific characteristics of the asset that are not reflected in the benchmark but may have a material impact on price (e.g. time to next D-check and age of the fuselage for aviation).

- Adjusting for situations where benchmarks have been distorted from market value by transactions that do not meet the definition of "market value" set out above. For instance, where manufacturers have transacted at above market value to maintain residual values so as to not trip leasing covenants.

- Ships and planes under construction are valued according to the status of construction.

Where crucial information is missing, appropriate conservatism is applied.

For ships and planes chartered to an investment-grade charter party for more than five years, a DCF approach may be followed.

The net effective charter rate during the charter period is discounted by the yield to maturity of a senior unsecured exposure to the charter party.

A residual value is determined at the end of the charter based on market rates.

As with real estate, the NCA should conduct a thorough review of the name level valuations, ensuring that appropriate benchmarks have been applied for specific assets and that prudent adjustments have been made to these benchmarks. A template for delivering this information is provided. The template is also provided to the CPMO (T5).

5.8 Other assets

Tax assets provided as collateral should be valued at 0.

For any other collateral, the bank should provide either the most recent price for the collateral based on public market data for the specific asset (e.g. liquid bonds or equities) or a valuation of the asset by an independent external party. Valuations carried out within the 12 months before the AQR reference date by an independent external party using a market value approach are acceptable. If a valuation by an independent external party is not available, the bank should have one carried out. The bank team should verify a) that the chosen provider is qualified to carry out the valuation, and b) that the valuation is carried out using a market value approach.

In the case of esoteric assets, such as artwork that is valued by the bank at more than €50 million, the bank should commission valuations by two independent external parties and apply the lower of the two.

Appropriate documentation should be produced to support the valuations.

5.9 Outputs

The objective of the workblock is to ensure that all collateral values used in the credit file review or fair value exposures review are up to date and consistent with market value.

The following output needs to be produced for this workblock:

Table 77

Outputs for physical asset review workblock

Workblock	Output
5. Collateral and real estate valuation	Complete T5. Collateral and real estate valuation template

6   Projection of findings of credit file review

Once the credit file review is completed, the findings must be projected to the wider portfolio. Even though the sample sizes have been selected to ensure a reliable estimate of misstatement, it is essential that the projection of findings is performed with great care and in a pragmatic way. This section outlines the approach to projecting findings, including all of the safeguards that are applied to avoid overestimating the projection of misstatement – consistent with best audit practice.

6.1   Summary of the approach

Projecting misstatements observed in the sample to the wider portfolio is essential. The impact of the misstatement would otherwise be underestimated given the likelihood that issues will exist in the wider portfolio.

The specific metrics to be projected are:

- exposures reclassified as stage 3 (credit-impaired) and related provisions;

- number of debtors reclassified as stage 3 (credit-impaired);

- exposures reclassified as stage 2 (SICR).

Note that no projection of collateral valuation changes is required. For debtors that are covered by the credit file review, this is not necessary as collateral valuation changes are already reflected in impairment provisions after the credit file review. For debtors that are covered by collective provisions, collateral valuation changes due to reappraisal are projected as discussed in Section 7

The projection is based on the number-weighted average observed misstatement for each analysed debtor (including debtors from groups of connected clients that were not explicitly sampled) for each stratum (following audit guidelines).

The projection is determined by taking the average observed adjustment for each sampled stratum and applying the adjustment pro rata to the unsampled exposure in the stratum, subject to the following safeguards:

- Strata that are not sampled have no projection applied to them. This means that in most retail portfolios, a very large percentage of the portfolio (by exposure) will not have a projection applied. For retail portfolios this might apply to up to 90% of the portfolio by exposure.

- If the misstatement is trivial, it should be excluded from the projection of findings.

- If the adjustment stems from a single observation in the stratum, the observation is checked to see if it is an anomaly or if it has common features

that exist elsewhere in the sample. If no common features are found it is judged to be an anomaly and excluded from the projection of findings.

- Where a single observation within a stratum affects the projected total provisioning levels within the stratum by more than 100% (relative to the projected provisions excluding the single observation), the observation is checked to see whether the increased provisioning level observed is an anomaly, in which case the projected impact on non-sampled exposures from that observation may be capped at 100%[44].

- For the "significant risk" strata in particular, consideration should be given as to whether the observation indicates a need for increased representation within the sample of the share of exposures considered stage 1 or stage 2 by the bank before the exercise.

- If the average misstatement for a stratum is more than one percentage point above the average misstatement for the risk strata, it should be concluded that there is insufficient evidence to apply the average to that stratum and that the average for the risk strata should be applied instead.

- If the total adjustment (observed and projected misstatement) is less than 5% of the post-adjustment parameter (provisions, number of reclassifications to stage 2 or stage 3, etc.), the adjustment should be viewed as insignificant relative to the error bound and the projection of findings will therefore not be performed.

In testing, these safeguards limit the potential for overstating misstatements dramatically at the expense of a slight expected underestimation of the average projected misstatement.

This approach is consistent with ISA 530.

6.2 Indicative timeline

Table 78

Indicative timeline for the projection of findings of the credit file review

Task	Indicative date
Projections of findings of the credit file review	Week 20-week 23

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[44] The reasons for application of such a cap must be documented and approved individually by the CPMO in all cases.

6.3 Introduction

During the credit file review the bank teams draw conclusions that are not only recorded on an individual file basis but also constitute audit evidence of potential misstatements that have to be projected to the rest of the population, in accordance with International Standards on Auditing (ISA)[45]. The correction of misstatements is applied to the financial statements as of the AQR reference date to determine an AQR-adjusted CET1% ratio as an input to the stress test (see Section 9).

This section describes the methodology for the projection of misstatements. Since it largely leverages concepts and definitions explained in the section on sample selection, we therefore recommend reading that section first (see Section 3).

The main focus of the projection of findings is the provisioning levels of debtors that are assessed under the stage 3 (credit-impaired) approach. For these segments, the adjustment of provisions carried out for the debtors audited is projected to the rest of the debtors in line with the approach explained below. For the avoidance of doubt, this adjustment only affects exposures from corporate portfolios, in other words retail portfolios are not adjusted in this way.

In addition to the provisioning levels, the same approach is applied to project the number of reclassifications to stage 3 and stage 2 under IFRS 9, which are projected for retail and corporate exposures in WB 7 (collective provisioning).

6.4 Regulatory basis

6.4.1 Basis in standards on auditing

Standards on auditing from the *International Federation of Accountants* (IFAC), namely *International Standards on Auditing* (ISA), have been taken into account. The following considerations in particular are relevant and are summarised below:

> **ISA 530, A18**
>
> The auditor is required to project misstatements for the population to obtain a broad view of the scale of misstatement but this projection may not be sufficient to determine an amount to be recorded.

- The auditor is required to project misstatements.

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[45] ISA 530, Paragraph 14: "For tests of details, the auditor shall project misstatements found in the sample to the population."

ISA 530, Appendix 1, Paragraph 3

The results of audit procedures applied to a sample of items within a stratum can only be projected to the items that make up that stratum. To draw a conclusion on the entire population, the auditor will need to consider the risk of material misstatement in relation to whatever other strata make up the entire population. For example, 20% of the items in a population may make up 90% of the value of an account balance. The auditor may decide to examine a sample of these items. The auditor evaluates the results of this sample and reaches a conclusion on the 90% of value separately from the remaining 10% (on which a further sample or other means of gathering audit evidence will be used, or which may be considered immaterial).

- The findings from a stratum can only be projected to the items of that stratum.

- Findings from strata that have not been reviewed because they are considered immaterial will have no projection applied to them.

ISA 530, Appendix 1, Paragraph 4

If a class of transactions or account balance has been divided into strata, the misstatement is projected for each stratum separately. Projected misstatements for each stratum are then combined when considering the possible effect of misstatements on the total class of transactions or account balance.

- Although the findings from a stratum can only be projected to the items of that stratum, the findings from all of the reviewed strata have to be combined to assess the possible effect of misstatements on the whole portfolio.

ISA 450, Paragraph 15

The auditor shall evaluate whether uncorrected misstatements are material, individually or in aggregate. In making this evaluation, the auditor shall consider the size and nature of the misstatements, both in relation to particular classes of transactions, account balances and disclosures and the financial statements as a whole, and the particular circumstances of their occurrence.

- The materiality of the misstatements will be assessed.

ISA 450, A1

The auditor may designate an amount below which misstatements would be clearly trivial and would not need to be accumulated because the auditor expects that the accumulation of such amounts clearly would not have a material effect on the financial statement. "Clearly trivial" is not another expression for not material. Matters

that are "clearly trivial" will be of a wholly different (smaller) order of magnitude than materiality used in planning and performing the audit, and will be matters that are clearly inconsequential, whether taken individually or in aggregate and whether judged by any criteria of size, nature or circumstances. Whenever there is any uncertainty about whether one or more items are "clearly trivial", it is presumed that the matter is not "clearly trivial".

- On an individual debtor basis, the auditor will ignore trivial misstatements.

ISA 320, Paragraph 11

The auditor shall determine performance materiality for purposes of assessing the risks of material misstatement and determining the nature, timing and extent of further audit procedures.

- At portfolio level, performance materiality will be defined in order to assess the materiality of misstatements.

ISA 530, A7

In considering the characteristics of a population, for tests of controls, the auditor makes an assessment of the expected rate of deviation based on the auditor's understanding of the relevant controls or on the examination of a small number of items from the population. This assessment is made in order to design an audit sample and to determine sample size. For example, if the expected rate of deviation is unacceptably high, the auditor will normally decide not to perform tests of controls. Similarly, for tests of details, the auditor makes an assessment of the expected misstatement in the population. If the expected misstatement is high, 100% examination or use of a large sample size may be appropriate when performing tests of details.

- The auditor will estimate an expected misstatement.

- This assessment will be used to assess the representativeness of the sample, for instance whether or not the sample size is appropriate.

ISA 530, A21

For tests of controls, an unexpectedly high sample deviation rate may lead to an increase in the assessed risk of material misstatement, unless further audit evidence substantiating the initial assessment is obtained. For tests of details, an unexpectedly high misstatement amount in a sample may cause the auditor to believe that a class of transactions or account balance is materially misstated, in the absence of further audit evidence that no material misstatement exists.

- A significant deviation from the expected misstatement may make the auditor believe that there is a material deviation compared with the expectation.

ISA 530, A3

When designing a sample, the auditor determines tolerable misstatement in order to address the risk that the aggregate of individually immaterial misstatements may cause the financial statements to be materially misstated and provide a margin for possible undetected misstatements. Tolerable misstatement is the application of performance materiality, as defined in ISA 320, 2 to a particular sampling procedure. Tolerable misstatement maybe the same amount or an amount lower than performance materiality.

- The auditor will determine a tolerable misstatement to assess the materiality of the misstatement.

ISA 530, Paragraph 13

In the extremely rare circumstances when the auditor considers a misstatement or deviation discovered in a sample to be an anomaly, the auditor shall obtain a high degree of certainty that such misstatement or deviation is not representative of the population. The auditor shall obtain this degree of certainty by performing additional audit procedures to obtain sufficient appropriate audit evidence that the misstatement or deviation does not affect the remainder of the population.

- If the deviation of the observed misstatement and the expected misstatement is high, an anomaly might exist.

- The auditor will investigate whether that misstatement is representative of the population.

- Additional audit procedures may be used in this verification.

- The auditor may conclude that the cause for the anomaly does not apply to the remainder of the population, meaning that it will not be projected.

ISA 530, A17

In analysing the deviations and misstatements identified, the auditor may observe that many have a common feature, for example, type of transaction, location, product line or period of time. In such circumstances, the auditor may decide to identify all items in the population that possess the common feature, and extend audit procedures to those items. In addition, such deviations or misstatements may be intentional, and may indicate the possibility of fraud.

- During the review of potential anomalies, the auditor will look for common features or hints of intentionality or potential fraud.

- If these are found, additional procedures may be necessary.

ISA 530, A22

In the case of tests of details, the projected misstatement plus anomalous misstatement, if any, is the auditor's best estimate of misstatement in the population. When the projected misstatement plus anomalous misstatement, if any, exceeds tolerable misstatement, the sample does not provide a reasonable basis for conclusions about the population that has been tested. The closer the projected misstatement plus anomalous misstatement is to tolerable misstatement, the more likely that actual misstatement in the population may exceed tolerable misstatement. Also if the projected misstatement is greater than the auditor's expectations of misstatement used to determine the sample size, the auditor may conclude that there is an unacceptable sampling risk that the actual misstatement in the population exceeds the tolerable misstatement. Considering the results of other audit procedures helps the auditor to assess the risk that actual misstatement in the population exceeds tolerable misstatement, and the risk may be reduced if additional audit evidence is obtained.

- Once potential anomalies have been reviewed, the auditor will conclude whether the audit evidence is sufficient to carry out the projection of findings.

ISA 530, A23

If the auditor concludes that audit sampling has not provided a reasonable basis for conclusions about the population that has been tested, the auditor may: (a) Request management to investigate misstatements that have been identified and the potential for further misstatements and to make any necessary adjustments; or (b) Tailor the nature, timing and extent of those further audit procedures to best achieve the required assurance. For example, in the case of tests of controls, the auditor might extend the sample size, test an alternative control or modify related substantive procedures.

- If the auditor concludes that the sampling has not provided sufficient evidence, additional audit procedures may apply.

Additional standards have also been taken into account and are referred to in this section where relevant, in particular:

- ISA 200 – Overall objectives of the independent auditor and the conduct of an audit in accordance with International Standards on Auditing;

- ISA 315 – Identifying and assessing the risks of material misstatement through understanding the entity and its environment;

- ISA 320 – Materiality in planning and performing an audit;

- ISA 330 – The auditor's responses to assessed risks;

- ISA 450 – Evaluation of misstatements identified during the audit;

- ISA 500 – Audit evidence.

6.4.2 Basis for combining the results of the projection of findings and collective provisioning assessment

One of the key specific characteristics of the assessment of stage 1 and stage 2 corporate debtors is that the projection of specific debtors reclassified as credit-impaired is complemented by a collective provision analysis of the provisions required for stage 1 and stage 2. Although we recognise that such a combination is not common in auditing practice, it is used as an expedient measure in the AQR to ensure feasibility (as projection of specific credit-impairments avoids the need for a file review for every stage 1 and stage 2 exposure)

When banks set their provisions for individually assessed exposures they:

- Test each stage 1 and stage 2 exposure for credit impairment through an individual file review;

- Use a collective approach to determine provisions for all exposures which are not credit impaired (i.e. still classified as stage 1 or stage 2) as per the individual file review.

In the AQR, the first step is instead achieved through a sampling approach, and the reclassification results are then projected to the entire stage 1 and stage 2 group. The exposure that is projected to be credit-impaired is then removed from the collective provisioning approach to avoid double-counting.

For clarification, let us look at a simplistic numeric example. Consider a stratum with 1,000 debtors, each with an exposure of €1 million, none currently classified as credit-impaired. The credit file review analysis of a sample of 100 debtors in this stratum results in 20% of them being reclassified as credit-impaired. Assuming that 100% of their exposures are credit-impaired, the projection of findings would then result in an additional portion of €200 million (20 million sampled, 180 million extrapolated) in the portfolio that would also be credit-impaired. As for the collective provision analysis, the remaining €800 million portion of the stratum (not credit-impaired) is used as an input (EAD) to the collective provision analysis.

Staging information is also passed on to the collective provisioning workblock. If the 1,000 facilities above were considered to be stage 1 by the bank throughout the sampling process before the credit file review, and in addition to the 200 stage 3

misstatements identified, a further 600 were assessed as subject to SICR during the classification review, the projection of findings output would imply an exposure-weighted stage 2 share of 75% = (600/800) to be taken into account in the collective provision analysis.

In the case of stage 1 exposures within an AQR risk category for which backstop triggers for stage 2 reclassification have already been hit before sampling, the exposure-weighted stage 2 share is usually calculated on the basis of the credit file review results for the "significant risk" common risk stratum. This simplification, which avoids a further split of the "significant risk" strata, is deemed to be generally appropriate as a means of avoiding the need to drastically increase the amount of strata and debtors sampled for the credit file review.

In cases where pre-sampling reclassification due to AQR backstop triggers affects material parts of the exposure within an AQR risk category (from 1 to 5), expert judgement should be applied at this step to avoid extrapolation of larger sampling errors. In particular, where the share of reclassified stage 1 exposures in the "significant risk" common risk stratum is materially different from that same share within the sampled significant risk exposures, consideration should also be given to augmenting the sample with reserve debtors to increase representativeness or in extreme cases even to splitting the "significant risk" common risk stratum (and sample) into two distinct strata to take account of this effect.

6.5 Illustrative models, parameter sheets and templates

The following illustrative models, parameter sheets and templates are relevant to this workblock:

Table 79

Illustrative models for projection of findings

Subject	Illustrative model/parameter sheet
Projection of findings	Step-by-step example of projection process on results of AQR

Table 80

Template for projection of findings

Template	Summary of contents	Frequency of submission to CPMO
T6 projection of findings tool	Tool that takes the results of credit file review findings and projects the findings for the unsampled exposure for the relevant portfolio Results from the template are used in the AQR-adjusted CET1% ratio template	At end of task

6.6   Approach to projecting findings

Before reading this section, the related terminology should be made clear:

- A stratum is a sub-segment of a portfolio with similar exposure size and risk classification, e.g. significant risk, exposure size bucket 1.

- Strata is the plural of stratum.

- A common risk stratum is a group of strata with different levels of exposures but the same risk characteristics. For example, significant risk, exposure size bucket 1, and significant risk, exposure size bucket 2, would both be in a common risk stratum.

- A common exposure stratum is a group of sub-segments with different levels of risk but the same exposure characteristics. For example, significant risk, exposure size bucket 1, and stage 1 low risk, exposure size bucket 1, would both be in a common exposure stratum.

The approach to projecting findings consists of nine steps. The steps are implemented in the projection of findings template. The nine-step process is as follows:

- Step 1 – Calculate misstatements for each debtor in the sample, differentiated by stratum.

- Step 2 – Identify and remove clearly trivial misstatements.

- Step 3 – Calculate simple average number-weighted adjustment per stratum.

- Step 4 – Calculate simple average number-weighted adjustment per common risk stratum.

- Step 5 – Identify strata which show evidence of over or underestimation of misstatement based on statistical tests.

- Step 6 – For strata with evidence of over or underestimation, perform checks to examine whether deviation is due to an anomaly.

- Step 7 – Adjust for confirmed anomalies.

- Step 8 – After adjustment for anomalies, project findings based on the stratum average for strata which do not show evidence of over or underestimation. For strata which do show evidence of over or underestimation, project findings based on the common risk stratum average.

- Step 9 – Set projection of findings to zero if the total estimated misstatement (following projection of findings) is less than 5% of the post-projection of findings estimate of provisions.

Care must be taken when projecting the very low risk and low risk, exposure size buckets 1 due to the potentially relatively low sampling rate. If the finding is believed

to significantly under or overestimate the misstatement, then given the low sampling rate in this stratum, expert judgement may be used to ensure the finding is appropriate. Any expert adjustment to the finding for normal risk, exposure size bucket 1 may only be made with the explicit agreement of the CPMO.

To simplify the handover of findings from this workblock to the collective provision analysis, an aggregation of findings to individual AQR risk category levels is performed in section D of the template. These extrapolations do not affect the results of the credit file review or the projection of findings workblocks. Depending on the final results and the representativeness of the original sample for the significant risk common risk stratum selected, however, investigation of further debtors (e.g. from the reserve sample) may become necessary to increase confidence in the parameters handed over.

The following subsections show worked examples for calculating provision misstatements. The approach is the same for future loss and number of debtors reclassified as stage 3 projection except where explicitly stated otherwise.

6.6.1 Step 1 – Calculate misstatements for each debtor in the sample, differentiated by stratum

Step 1 involves calculating the misstatements for each debtor in the sample, as a percentage of gross exposure.

Table 81

Calculation of provision misstatement

Riskiness bucket	Exposure size bucket	Sample size	Sampling rate	Required adjustment, as per the credit file review												
				1	2	3	4	5	6	7	8	9	10	11	12	13
Default >12M	5th Percentile	0	0%													
Default >12M	Bucket 1	13	0%	11%	0.1%	0%	0%	0%	10%	0%	0%	8%	9%	9%	0%	0%
Default >12M	Bucket 2	13	21%	10%	0%	0%	0%	0%	0%	77%	0%	0%	9%	0%	0%	0%
Default >12M	Bucket 3	13	65%	0%	0%	9%	0%	10%	0%	23%	0%	0%	0%	0%	0%	11%
Default >12M	Bucket 4	11	100%	0%	8%	0%	7%	0%	0%	0%	0%	0%	0%	0%		
Default >12M	Bucket 5	4	100%	0%	0%	9%	0%									
Default >12M	TOP10	10	100%	0%	10%	0%	0%	0%	9%	0%	0%	11%	0%			
Default <12M	5th Percentile	0	0%													
Default <12M	Bucket 1	13	0%	0%	0%	8%	0%	9%	11%	0%	20%	8%	0%	10%	0%	0%
Default <12M	Bucket 2	13	12%	9%	10%	0%	8%	0%	9%	0%	0%	0%	0%	0%	11%	0%
Default <12M	Bucket 3	13	37%	0%	0%	0%	11%	10%	0%	0%	0%	0%	10%	0%	0%	0%
Default <12M	Bucket 4	9	100%	0%	0%	0.1%	0%	10%	9%	11%	0%	12%				
Default <12M	Bucket 5	6	100%	0%	0%	12%	0%	10%	11%							
Default <12M	TOP10	10	100%	10%	9%	0%	10%	0%	0%	0%	8%	0%	11%			

6.6.2 Step 2 – Identify and remove clearly trivial misstatements

The next step involves removing any trivial provisioning adjustments, as illustrated in the table below. Trivial misstatements are those of 1% or less of gross exposure.

Table 82

Adjustment for trivial provision misstatements

Riskiness bucket	Exposure size bucket	Sample size	Sampling rate	Required adjustment, as per the credit file review												
				1	2	3	4	5	6	7	8	9	10	11	12	13
Default >12M	5th Percentile	0	0%													
Default >12M	Bucket 1	13	0%	11%	0%	0%	0%	0%	10%	0%	0%	8%	9%	9%	0%	0%
Default >12M	Bucket 2	13	21%	10%	0%	0%	0%	0%	0%	77%	0%	0%	9%	0%	0%	0%
Default >12M	Bucket 3	13	65%	0%	0%	9%	0%	10%	0%	23%	0%	0%	0%	0%	0%	11%
Default >12M	Bucket 4	11	100%	0%	8%	0%	7%	0%	0%	0%	0%	0%	0%	0%		
Default >12M	Bucket 5	4	100%	0%	0%	9%	0%									
Default >12M	TOP10	10	100%	0%	10%	0%	0%	0%	9%	0%	0%	11%	0%			
Default <12M	5th Percentile	0	0%													
Default <12M	Bucket 1	13	0%	0%	0%	8%	0%	9%	11%	0%	20%	8%	0%	10%	0%	0%
Default <12M	Bucket 2	13	12%	9%	10%	0%	8%	0%	9%	0%	0%	0%	0%	0%	11%	0%
Default <12M	Bucket 3	13	37%	0%	0%	0%	11%	10%	0%	0%	0%	0%	10%	0%	0%	0%
Default <12M	Bucket 4	9	100%	0%	0%	0%	0%	10%	9%	11%	0%	12%				
Default <12M	Bucket 5	6	100%	0%	0%	12%	0%	10%	11%							
Default <12M	TOP10	10	100%	10%	9%	0%	10%	0%	0%	0%	8%	0%	11%			

For number of debtors reclassified as stage 2 or stage 3, projection step 2 can be omitted as no misstatements are trivial.

6.6.3   Step 3 – Calculate simple average adjustment per stratum

The next step is to calculate the simple average misstatement for each stratum, as illustrated below.

Table 83

Calculation of average provision misstatement per stratum

Riskiness bucket	Exposure size bucket	Sample size	Sampling rate	Required adjustment, as per the credit file review													Stratum average
				1	2	3	4	5	6	7	8	9	10	11	12	13	
Default >12M	5th Percentile	0	0%														0.0%
Default >12M	Bucket 1	13	0%	11%	0%	0%	0%	0%	10%	0%	0%	8%	9%	9%	0%	0%	3.6%
Default >12M	Bucket 2	13	21%	10%	0%	0%	0%	0%	0%	77%	0%	0%	9%	0%	0%	0%	7.4%
Default >12M	Bucket 3	13	65%	0%	0%	9%	0%	10%	0%	23%	0%	0%	0%	0%	0%	11%	4.1%
Default >12M	Bucket 4	11	100%	0%	8%	0%	7%	0%	0%	0%	0%	0%	0%	0%			1.4%
Default >12M	Bucket 5	4	100%	0%	0%	9%	0%										2.3%
Default >12M	TOP10	10	100%	0%	10%	0%	0%	0%	9%	0%	0%	11%	0%				3.0%
Default <12M	5th Percentile	0	0%														0.0%
Default <12M	Bucket 1	13	0%	0%	0%	8%	0%	9%	11%	0%	20%	8%	0%	10%	0%	0%	5.0%
Default <12M	Bucket 2	13	12%	9%	10%	0%	8%	0%	9%	0%	0%	0%	0%	0%	11%	0%	3.6%
Default <12M	Bucket 3	13	37%	0%	0%	0%	11%	10%	0%	0%	0%	0%	10%	0%	0%	0%	2.3%
Default <12M	Bucket 4	9	100%	0%	0%	0%	0%	10%	9%	11%	0%	12%					4.7%
Default <12M	Bucket 5	6	100%	0%	0%	12%	0%	10%	11%								5.4%
Default <12M	TOP10	10	100%	10%	9%	0%	10%	0%	0%	0%	8%	0%	11%				4.9%

6.6.4   Step 4 – Calculate simple average adjustment per common risk stratum

The next step is to determine the simple average misstatement for common risk strata, in other words strata that are in the same riskiness bucket. The top 10 (i.e. priority debtors) are excluded from the calculation.

Table 84

Calculation of average provision misstatement per common risk stratum

Riskiness bucket	Exposure size bucket	Sample size	Sampling rate	1	2	3	4	5	6	7	8	9	10	11	12	13	Stratum average	Common Risk Strata average
Default >12M	5th Percentile	0	0%														0.0%	
Default >12M	Bucket 1	13	0%	11%	0%	0%	0%	0%	10%	0%	0%	8%	9%	9%	0%	0%	3.6%	4.1%
Default >12M	Bucket 2	13	21%	10%	0%	0%	0%	0%	0%	77%	0%	0%	9%	0%	0%	0%	7.4%	
Default >12M	Bucket 3	13	65%	0%	0%	9%	0%	10%	0%	23%	0%	0%	0%	0%	0%	11%	4.1%	
Default >12M	Bucket 4	11	100%	0%	8%	0%	7%	0%	0%	0%	0%	0%	0%				1.4%	
Default >12M	Bucket 5	4	100%	0%	0%	9%	0%										2.3%	
Default >12M	TOP10	10	100%	0%	10%	0%	0%	0%	9%	0%	0%	11%	0%				3.0%	
Default <12M	5th Percentile	0	0%														0.0%	
Default <12M	Bucket 1	13	0%	0%	0%	8%	0%	9%	11%	0%	20%	8%	0%	10%	0%	0%	5.0%	4.0%
Default <12M	Bucket 2	13	12%	9%	10%	0%	8%	0%	9%	0%	0%	0%	0%	0%	11%	0%	3.6%	
Default <12M	Bucket 3	13	37%	0%	0%	0%	11%	10%	0%	0%	0%	0%	10%	0%	0%	0%	2.3%	
Default <12M	Bucket 4	9	100%	0%	0%	0%	0%	10%	9%	11%	0%	12%					4.7%	
Default <12M	Bucket 5	6	100%	0%	0%	12%	0%	10%	11%								5.4%	
Default <12M	TOP10	10	100%	10%	9%	0%	10%	0%	0%	0%	8%	0%	11%				4.9%	

Purely for illustrative purposes, the table below is an example of the same procedure for number of debtors reclassified as stage 3.

Table 85

Calculation of average NPE misstatement per common risk stratum

Exposure size bucket	Sample size	Sampling rate	1	2	3	4	5	6	7	8	9	10	11	12	13	Stratum average	Common Risk Strata average
5th Percentile	0	0%														0.0%	
Bucket 1	13	0%	0	1	1	0	0	0	0	0	0	1	0	0	1	30.8%	11.1%
Bucket 2	13	21%	0	0	1	0	0	0	0	0	0	0	0	0	0	7.7%	
Bucket 3	13	65%	0	0	0	0	0	0	0	0	0	1	0	0		7.7%	
Bucket 4	11	100%	0	0	0	0	0	0	0	0	0	0	0			0.0%	
Bucket 5	4	100%	0	0	0	0										0.0%	
TOP10	10	100%	0	0	0	0	0	0	0	0	0					0.0%	
5th Percentile	0	0%														0.0%	
Bucket 1	13	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%	3.7%
Bucket 2	13	12%	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%	
Bucket 3	13	37%	0	0	0	1	0	0	0	0	0	0	0	0		7.7%	
Bucket 4	9	100%	0	0	0	0	0	0	0	0	0					0.0%	
Bucket 5	6	100%	0	0	0	0	1	0								16.7%	
TOP10	10	100%	0	0	0	0	0	0	1	0	0	0				10.0%	

6.6.5 Step 5 – Identify strata which show evidence of over or underestimation of misstatement based on statistical tests

Statistical tests are used to highlight results showing evidence that misstatement is under or overestimated, based on comparison with the common risk stratum average. The statistical tests are implemented in the Excel template provided.

Table 86

Identification of strata which show evidence of overestimation of provisions

Riskiness bucket	Exposure size bucket	Sample size	Sampling rate	1	2	3	4	5	6	7	8	9	10	11	12	13	Stratum average	Common Risk Strata average
Default >12M	5th Percentile	0	0%														0.0%	
Default >12M	Bucket 1	13	0.5%	11%	0%	0%	0%	0%	10%	0%	20%	8%	9%	9%	0%	0%	5.2%	4.5%
Default >12M	Bucket 2	13	21%	10%	0%	0%	0%	0%	0%	77%	0%	0%	9%	0%	0%		7.4%	
Default >12M	Bucket 3	13	65%	0%	0%	9%	0%	10%	0%	23%	0%	0%	0%	0%	0%	11%	4.1%	
Default >12M	Bucket 4	11	100%	0%	8%	0%	7%	0%	0%	0%	0%	0%	0%				1.4%	
Default >12M	Bucket 5	4	100%	0%	0%	9%	0%										2.3%	
Default >12M	TOP10	10	100%	0%	10%	0%	0%	0%	9%	0%	0%	11%	0%				4.8%	
Default <12M	5th Percentile	0	0%															
Default <12M	Bucket 1	13	0.3%	0%	0%	8%	0%	9%	11%	0%	0%	8%	0%	10%	0%	0%	3.5%	3.7%
Default <12M	Bucket 2	13	12%	9%	10%	0%	8%	0%	9%	0%	0%	0%	0%	0%	11%	0%	3.6%	
Default <12M	Bucket 3	13	37%	0%	0%	0%	11%	10%	0%	0%	0%	0%	10%	0%	0%	0%	2.3%	
Default <12M	Bucket 4	9	100%	0%	0%	0%	0%	10%	9%	11%	0%	12%					4.7%	
Default <12M	Bucket 5	6	100%	0%	0%	12%	0%	10%	11%								5.4%	
Default <12M	TOP10	10	100%	10%	9%	0%	10%	0%	0%	0%	8%	0%	11%				5.2%	

6.6.6 Step 6 – For strata with evidence of over or underestimation, perform checks to examine whether deviation is due to an anomaly

Three options exist for dealing with anomalies.

1. Anomaly is caused by missing information on the sampled file and is therefore considered to be a complete misstatement. In this case the projection is computed excluding this misstatement and replaced with another debtor from the reserve sample.

2. Anomaly is considered to be an outlier and is therefore corrected or excluded from the projection of the misstatement (ref.: ISA 530, Para. 13) and replaced with another debtor from the reserve sample.

3. If a common feature of the anomaly (ref.: ISA 530, A17) is detected in the rest of the sample (e.g. collateral misvaluation, failure to identify a concession, etc.), the bank team should not make any adjustment for the anomalous misstatement.

6.6.7 Step 7 – Adjust for confirmed anomalies

After adjustment for anomalies, the averages per stratum and common risk stratum are updated as illustrated below.

Table 87

Adjustment for confirmed anomalies

Riskiness bucket	Exposure size bucket	Sample size	Sampling rate	1	2	3	4	5	6	7	8	9	10	11	12	13	Stratum average	Riskiness bucket average
				Required adjustment, as per the credit file review														
Default >12M	5th Percentile	0	0%														0.0%	
Default >12M	Bucket 1	13	0.5%	11%	0%	0%	0%	0%	10%	0%	20%	8%	9%	9%	0%	0%	5.2%	
Default >12M	Bucket 2	13	21.0%	10%	0%	0%	0%	0%	0%	10%	0%	0%	9%	0%	0%	0%	2.2%	
Default >12M	Bucket 3	13	65%	0%	0%	9%	0%	10%	0%	23%	0%	0%	0%	0%	11%		4.1%	3.2%
Default >12M	Bucket 4	11	100%	0%	8%	0%	7%	0%	0%	0%	0%	0%	0%				1.4%	
Default >12M	Bucket 5	4	100%	0%	0%	9%	0%										2.3%	
Default >12M	TOP10	10	100%	0%	10%	0%	0%	0%	9%	0%	0%	11%	0%				3.0%	
Default <12M	5th Percentile	0	0%														0.0%	
Default <12M	Bucket 1	13	0.3%	0%	0%	8%	0%	9%	11%	0%	20%	8%	0%	10%	0%	0%	5.0%	
Default <12M	Bucket 2	13	11.8%	9%	10%	0%	8%	0%	9%	0%	0%	0%	0%	0%	11%	0%	3.6%	4.0%
Default <12M	Bucket 3	13	37%	0%	0%	0%	11%	10%	0%	0%	0%	0%	10%	0%	0%	0%	2.3%	
Default <12M	Bucket 4	9	100%	0%	0%	0%	0%	10%	9%	11%	0%	12%					4.7%	
Default <12M	Bucket 5	6	100%	0%	0%	12%	0%	10%	11%								5.4%	
Default <12M	TOP10	10	100%	10%	9%	0%	10%	0%	0%	0%	8%	0%	11%				4.9%	

6.6.8 Step 8 – Adjust for segments which still show evidence of over or underestimation and project findings

The penultimate step involves projecting findings to unsampled exposures. Where segments appear to still show evidence of over or underestimation (qualitative judgement) and the sample is less than 10% of the total stratum exposure, findings are projected based on the common risk stratum average rather than the stratum average. This avoids the potential for large sampling errors. For the avoidance of doubt, misstatement is calculated on an absolute rather than relative basis, i.e. if the increase in provisions for the sample is 10 million on an exposure of 100 million, the

projection of findings is 10% of the unsampled exposure. This is illustrated in the table below.

Table 88

Projection of findings to unsampled portfolio

Riskiness bucket	Exposure size bucket	Sample size	Sampling rate	Stratum Average	Common Risk Strata Average	Provision mistatement for projection of findings	Exposure in sample (€MM)	Exposure unsampled (€MM)	Mistatement on sample	Projection of mistatement to unsampled portfolio
Default >12M	5th Percentile	0	0%	0.00%	N/A	0.00%	-	2	N/A	-
Default >12M	Bucket 1	13	0.5%	3.62%	2.84%	3.62%	1.3	265	0	10
Default >12M	Bucket 2	13	21%	2.22%	2.84%	2.22%	14	54	0	1
Default >12M	Bucket 3	13	65%	4.11%	2.84%	4.11%	26	14	1	1
Default >12M	Bucket 4	11	100%	1.36%	2.84%	1.36%	75	-	1	-
Default >12M	Bucket 5	4	100%	2.25%	2.84%	2.25%	60	-	1	-
Default >12M	TOP10	10	100%	2.99%	N/A	2.99%	400	-	12	-
Default <12M	5th Percentile	0	0%	0.00%	N/A	0.00%	-	3	N/A	-
Default <12M	Bucket 1	13	0.3%	4.99%	4.02%	4.02%	1.7	662	0	27
Default <12M	Bucket 2	13	12%	3.65%	4.02%	3.65%	13	97	0	4
Default <12M	Bucket 3	13	37%	2.34%	4.02%	2.34%	27	47	1	1
Default <12M	Bucket 4	9	100%	4.70%	4.02%	4.70%	70	-	3	-
Default <12M	Bucket 5	6	100%	5.35%	4.02%	5.35%	56	-	3	-
Default <12M	TOP10	10	100%	4.88%	N/A	4.88%	389	-	19	-
Sub-total									42	43

The same procedure is followed for NPE projection. Again, any strata for which the sample is less than 10% of the stratum exposure should be projected based on the common risk stratum average rather than the stratum average.

Expert judgement should be applied at this stage to ensure that the indicated misstatement for projecting the very low risk and low risk, exposure bucket 1 stratum is appropriate. This is because the exposure size in this stratum may be large, and it is important that sampling error in the single stratum does not lead to overestimation. Any expert judgement applied should be communicated to the CPMO and discussed fully before the results are finalised.

6.6.9 Step 9 – Set projection of findings to zero if the total estimated misstatement (following projection of findings) is less than 5% of the post-projection of findings estimate of provisions

To avoid false accuracy in the projection of findings, we only project findings where the result after projection is outside the acceptable tolerance used for sampling. Therefore, if our estimate of the misstatement of provisions following projection of findings is less than 5% of the total estimated post-projection provisions, we set the projection of findings to zero. Similarly, if our estimate of the number of debtors reclassified to stage 2 and stage 3 following projection of findings is less than 5% of the total estimated number of debtors reclassified to stage 2 and stage 3 after projection, we set the projection of findings to zero. For the avoidance of doubt, any material findings for the sample should still be defined as an adjustment to provisions and included in the accounts and in the AQR-adjusted CET1% as discussed in later sections.

6.7   Outputs

The objective of the projection of findings workblock is to apply the findings of the credit file review to the wider portfolio to arrive at estimates of adjustments for the wider portfolio.

The projection of findings is only carried out for the purposes of determining the AQR-adjusted CET1% for use in the stress test. Banks are not expected to explicitly incorporate the projection of findings in their accounts following the exercise. Any capital requirements arising as a result of the projection of findings would be expected to be reflected in Pillar 2 capital requirements following the CA.

There are no specific outputs to be produced for this workblock.

7   Collective provision analysis

This section explains the approach for qualitatively and quantitatively assessing the level of provisioning for the parts of a bank's portfolio that would typically be impaired on a collective basis under IFRS 9.

For the purposes of the AQR, the analysis of collective provisions applies to all retail exposures (as per AQR asset segmentation) and all non-retail exposures classified as stage 1 or stage 2, irrespective of whether the bank uses an individual or collective assessment approach for parts of these portfolios.

The approach involves reviewing the methodology of the bank's collective provisioning model for compliance with accounting principles. The calibration of the model is then quantitatively sense-checked by creating a simple, statistical model to estimate provisioning levels based on observed bank data (the "challenger model"). Differences between the bank's reported provisioning levels and the levels estimated using the challenger model shed light on the compliance of the bank's model with accounting standards.

It should be noted that there is no intention to force banks to adopt the challenger model in their accounts. The challenger model is a prudential measure enabling a quantitative challenge of the bank's model and its calibration. It will only have a subsequent impact on AQR-adjusted CET1% if the bank's model cannot be fully justified in line with supervisory requirements in the context of the AQR.

7.1   Summary of the approach

The methodology of the bank's collective provisioning model is first reviewed for compliance with minimum accounting requirements (see Section 7.4). In particular, it is reviewed with respect to:

- segmentation/grouping of exposures;

- calculation of lifetime ECL;

- identification of SICR;

- incorporation of multiple scenarios;

- use of practical expedients.

The bank team then develops a simple challenger model. This is used to carry out a quantitative sense-check on the calibration of the bank's collective provisioning model. This step is essential, as it allows any issues with the bank's provisioning to be identified and quantified. The generalised form of the challenger model for retail exposures is as follows:

$$ECL = PD_{12M} * LGL_{12M} * EAD_{12M} * \frac{1}{1 + EIR} * \%_{\text{stage 1}}$$

$$+ \sum_{i=1}^{10} PDi * LGL_i * EAD_i * \frac{1}{(1 + EIR)^i} * \%_{\text{stage 2\&3}}$$

where:

- PD = marginal probability of default in period i

- LGL = loss given loss in period i

- EAD = exposure at default in period i

- EIR = effective interest rate

- $\%_{\text{stage1/2/3}}$ = percentage of exposure assigned to IFRS 9 stage 1/2/3

The generalised form of the challenger model for corporate exposures is as follows:

$$ECL = PD_{12M} * LGI_{12M} * EAD_{12M} * \frac{1}{1 + EIR} * \%_{\text{stage 1}}$$

$$+ \sum_{i=1}^{10} PDi * LGI_i * EAD_i * \frac{1}{(1 + EIR)^i} * \%_{\text{stage 2}}$$

where: LGI = loss given impairment in period i

The model is applied at the level of exposure sub-segments. The high-level approach to parameterisation of each element of the calculation is as follows:

PD: Migration matrices are generated based on observed migration of exposures between risk categories as per loan tape data. The raw migration matrices are conditioned for macroeconomic scenarios using a Vasicek/Merton-style model. Cumulative multi-year matrices are then generated from the conditioned matrices, and marginal probabilities of default are extrapolated from the cumulative matrices.

LGD: For retail mortgages, a structural model based on the recoverable value of collateral is applied to determine LGL. For other retail and SMEs, average observed long-term recoveries are determined where sufficient data are available; where this is not the case, fall-back parameters defined by the ECB are used to determine LGL. For non-retail exposures, average coverage ratios for loans impaired in the last 12 months are calculated to determine LGI.

EAD: The bank provides run-down curves for contractual EAD, contractual EAD including prepayments and contractual EAD including prepayments and draw-down of off-balance-sheet exposures. EAD including prepayments and draw-down of off-balance-sheet exposures is used for the ECL calculation.

Staging: an exposure-based staging distribution is extrapolated from the loan tape.

EIR: Exposure-weighted EIR is extrapolated from the loan tape.

The challenger model uses a ten-year horizon for the ECL calculation. Parameters are calculated for different macroeconomic scenarios as applied in the credit file review (see Section 4.6), reflecting the projected macroeconomic conditions of each scenario. In line with the approach followed in the stress test, beyond the three-year stress test scenario horizon (i.e. in years 4-10 of the challenger model horizon) the evolution of all macroeconomic variables is assumed to stay flat (with the exception of GDP for which constant growth rates are assumed) and credit risk parameters in the adverse and (optional) upturn scenario are assumed to revert to the baseline credit risk parameters.

The challenger model is adjusted wherever possible to take account of one-off events (e.g. portfolio clean-up). The findings should be reinforced by considering the findings of IRB validation reports[46] (where these exist) and any publicly available analysis (e.g. on the performance of securitisation pools) – particularly in relation to parameters such as LGL.

The challenger model is applied to the bank's current portfolio and the outputs compared with the bank's current provisioning levels as a sense-check of the calibration of the bank's model, as shown in the table below:

Table 89

Illustrative output of challenger model analysis

Segment						Expo-sure	Provision estimates								Compari-son
							Challenger Model Provisions (€m)				Bank Provisions (€m)				Difference in provision estimates
AQR Asset Class	AQR Risk Bucket	Product	Channel	LTV bucket	Maturity Bucket	EAD (€m)	S1	S2	S3	Total	S1	S2	S3	Total	(€m)
Retail SME	1	Mortgage		50%-100%	1-12 m	249.3	1.2	23.6	0.0	24.7	0.9	18.9	0.0	19.8	4.9
Retail SME	2	Mortgage		50%-100%	1-12 m	81.4	0.3	13.7	0.0	14.0	0.2	10.9	0.0	11.2	2.8
Retail SME	3	Mortgage		50%-100%	1-12 m	50.7	0.4	12.1	0.0	12.5	0.3	6.1	0.0	6.4	6.1
Retail SME	4	Mortgage		50%-100%	1-12 m	36.2	0.4	5.4	0.0	5.8	0.3	4.3	0.0	4.6	1.2
Retail SME	5	Mortgage		50%-100%	1-12 m	18.4	0.0	4.4	0.0	4.5	0.0	3.5	0.0	3.6	0.9
Retail SME	Cured	Mortgage		50%-100%	1-12 m	9.5	0.0	1.8	0.0	1.8	0.0	1.4	0.0	1.5	0.4
Retail SME	1-30 DPD	Mortgage		50%-100%	1-12 m	7.6	0.1	1.7	0.0	1.8	0.1	1.4	0.0	1.4	0.4
Retail SME	31-60 DPD	Mortgage		50%-100%	1-12 m	2.8	0.0	0.0	1.0	1.0	0.0	0.0	0.8	0.8	0.2
Retail SME	61-90 DPD	Mortgage		50%-100%	1-12 m	25.1	0.0	0.0	10.9	10.9	0.0	0.0	8.7	8.7	2.2
Retail SME	D 90-180	Mortgage		50%-100%	1-12 m	6.9	0.0	0.0	5.0	5.0	0.0	0.0	4.0	4.0	1.0
Retail SME	D 180+	Mortgage		50%-100%	1-12 m	8.7	0.0	0.0	6.2	6.2	0.0	0.0	5.0	5.0	1.2
Retail SME	1	Mortgage		50%-100%	13-24 m	2,725.6	13.3	267.8	0.0	281.1	9.3	214.2	0.0	223.5	57.5
Retail SME	2	Mortgage		50%-100%	13-24 m	515.1	2.0	93.3	0.0	95.4	1.4	74.7	0.0	76.1	19.3
Retail SME	3	Mortgage		50%-100%	13-24 m	229.6	1.7	59.4	0.0	61.1	1.2	29.7	0.0	30.9	30.2
Retail SME	4	Mortgage		50%-100%	13-24 m	117.9	1.4	18.5	0.0	19.9	1.0	9.3	0.0	10.2	9.7
Retail SME	5	Mortgage		50%-100%	13-24 m	166.5	0.4	41.6	0.0	42.0	0.3	20.8	0.0	21.1	20.9
Retail SME	Cured	Mortgage		50%-100%	13-24 m	69.0	0.3	14.1	0.0	14.4	0.2	7.0	0.0	7.3	7.2
Retail SME	1-30 DPD	Mortgage		50%-100%	13-24 m	33.2	0.4	8.3	0.0	8.6	0.3	4.1	0.0	4.4	4.2
Retail SME	31-60 DPD	Mortgage		50%-100%	13-24 m	30.4	0.0	0.0	11.6	11.6	0.0	0.0	9.3	9.3	2.3
Retail SME	61-90 DPD	Mortgage		50%-100%	13-24 m	14.2	0.0	0.0	6.3	6.3	0.0	0.0	5.0	5.0	1.3
Retail SME	D 90-180	Mortgage		50%-100%	13-24 m	67.8	0.0	0.0	51.8	51.8	0.0	0.0	31.1	31.1	20.7
Retail SME	D 180+	Mortgage		50%-100%	13-24 m	60.0	0.0	0.0	45.1	45.1	0.0	0.0	27.0	27.0	18.0

Once the challenger model and the bank's calibration have been compared, the bank team needs to assess whether the bank should be required to increase its provisions. Where the provisions determined using the challenger model exceed the

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[46] Differences in regulatory and accounting requirements for the calibration of similar parameters need to be taken into account when analysing the findings of IRB reports.

bank's provisions by less than 5% at portfolio level, this is deemed to be immaterial and need not be investigated further. Where the challenger model provisions exceed the bank's provisions by between 5% and 10%, the deviation may still be considered immaterial if there are good reasons relating to the data or methodology, agreed by the bank team and the CPMO, that explain the difference without the need for further investigation. Otherwise, the difference feeds into the overall AQR adjustment to provisions calculated in workblock 9.

Where the challenger model provisions exceed the bank's provisions by more than 10%, this should be investigated by comparing the challenger model with the details of the bank's model and data. If the difference can be attributed to data, methodology or calibration issues affecting the challenger model results, this may be considered as mitigation if the bank team and the CPMO agree this is appropriate based on plausible well-evidenced reasons. Otherwise, the difference feeds into the overall AQR adjustment to provisions calculated in workblock 9.

The challenger model is calibrated on the bank's own data. If the bank has no data, fall-back parameters may be used. The manual contains basic fall-back parameters, though JSTs/NCAs may propose alternative parameters based on objective analysis for the relevant country.

7.2 Indicative timeline

Table 90
Indicative timeline for collective provision analysis

Task	Indicative date
Review of bank's collective provisioning model	Week 6 – week 10
Loan tape data post-DIV available	Week 10
Additional information (sales log, write-off list, unsecured recovery data, etc.) identified	Week 10
Complete T7L	Week 11
Complete T7A	Week 12
Initial set of migration matrices compiled	Week 14
First-cut models developed without adjustment for credit file review	Week 15
Stable version of model before adjustments based on findings of credit file review	Week 21
Model parameters adjusted based on findings of credit file review	Week 24
Final results produced for AQR	Week 26
PI, CRx, LGLx and LGI parameters delivered for use in the stress test	Week 28

7.3 Illustrative models, parameter sheets and templates

The following illustrative models, parameter sheets and templates are relevant to this workblock:

Table 91

Illustrative models for collective provision analysis

Subject	Illustrative model/parameter sheet
Migration matrix conditioning	Step-by-step example of the calculation of Vasicek/Merton-style conditioning of migration matrices and Z&R value derivation
Loan tape data aggregation	Step-by-step example of the aggregation of loan tape data for the purposes of collective provisioning
LGL – retail mortgage	Step-by-step example of the calculation of LGL for retail mortgages with parameters and definitions
LGL – credit cards	Step-by-step example of the calculation of LGL for credit cards with parameters and definitions
LGI – corporate	Step-by-step example of the calculation of LGI for corporates with parameters and definitions
Collateral and other macro indices	Parameter sheet for collateral indices and other macro indices
Scenario weights	Example calculation for deriving probability weights for macroeconomic scenarios

Table 92

Templates for collective provision analysis

Template	Summary of contents	Frequency of submission to CPMO
T7L	Loan tape data from WB2, augmented with segmentation criteria and staging data	One version to be submitted
T7A	Multiple inputs required for the challenger model calculation (e.g. EAD run-down profiles, historic provisions & recoveries, Z&R factors for PD conditioning)	One version to be submitted
T7B Collective provision results template	Template for comparing challenger model results with bank's calibration and recording the results of the model review Results from template are used in the AQR-adjusted CET1% ratio template	Two versions to be submitted: Results based on analysis of loan tape with no adjustment for credit file review Results with adjustment for credit file review

7.4   Methodology review

The bank team reviews the bank's collective provisioning model for compliance with relevant accounting requirements. The key paragraphs of the European implementation of IFRS 9 are described below, with a summary of key takeaways provided after each one. It is against these statements of accounting requirements that the bank team reviews the level of compliance of the bank's collective provisioning model. The CPMO provides a list of methodological review points that need to be answered in the model review section of T7B.

IFRS 9 5.5.3

Subject to paragraphs 5.5.13–5.5.16, at each reporting date, an entity shall measure the loss allowance for a financial instrument at an amount equal to the lifetime expected credit losses if the credit risk on that financial instrument has increased significantly since initial recognition.

IFRS 9 5.5.4

The objective of the impairment requirements is to recognise lifetime expected credit losses for all financial instruments for which there have been significant increases in credit risk since initial recognition – whether assessed on an individual or collective basis – considering all reasonable and supportable information, including that which is forward-looking.

IFRS 9 5.5.5

Subject to paragraphs 5.5.13–5.5.16, if, at the reporting date, the credit risk on a financial instrument has not increased significantly since initial recognition, an entity shall measure the loss allowance for that financial instrument at an amount equal to 12-month expected credit losses.

At each reporting date, entities shall measure loss allowances for financial instruments based on their current status:

- Lifetime ECL if the credit risk on a financial instrument has increased significantly since initial recognition (see IFRS 9 5.5.9).

- 12-month ECL if the credit risk on a financial instrument has not increased significantly since initial recognition (see IFRS 9 5.5.9).

IFRS 9 5.5.9

At each reporting date, an entity shall assess whether the credit risk on a financial instrument has increased significantly since initial recognition. When making the assessment, an entity shall use the change in the risk of a default occurring over the expected life of the financial instrument instead of the change in the amount of expected credit losses. To make that assessment, an entity shall compare the risk of a default occurring on the financial instrument as at the reporting date with the risk of a default occurring on the financial instrument as at the date of initial recognition and consider reasonable and supportable information, that is available without undue cost or effort, that is indicative of significant increases in credit risk since initial recognition.

IFRS 9 B5.5.17

The following non-exhaustive list of information may be relevant in assessing changes in credit risk:

(a) significant changes in internal price indicators of credit risk as a result of a change in credit risk since inception, including, but not limited to, the credit spread that would result if a particular financial instrument or similar financial instrument with the same terms and the same counterparty were newly originated or issued at the reporting date.

(b) other changes in the rates or terms of an existing financial instrument that would be significantly different if the instrument was newly originated or issued at the reporting date (such as more stringent covenants, increased amounts of collateral or guarantees, or higher income coverage) because of changes in the credit risk of the financial instrument since initial recognition.

(…)

(o) changes in the entity's credit management approach in relation to the financial instrument; i.e. based on emerging indicators of changes in the credit risk of the financial instrument, the entity's credit risk management practice is expected to become more active or to be focused on managing the instrument, including the instrument becoming more closely monitored or controlled, or the entity specifically intervening with the borrower.

(p) past due information, including the rebuttable presumption as set out in paragraph 5.5.11.

The credit risk on a financial instrument is assessed by comparing the risk of a default occurring over the expected life of the financial instrument as at the reporting date with the risk of a default occurring on the financial instrument as at the date of initial recognition.

A non-exhaustive list of information that may be relevant in assessing changes in credit risk is provided in item B5.5.17.

IFRS 9 B5.5.28

Expected credit losses are a probability-weighted estimate of credit losses (i.e. the present value of all cash shortfalls) over the expected life of the financial instrument. A cash shortfall is the difference between the cash flows that are due to an entity in accordance with the contract and the cash flows that the entity expects to receive. Because expected credit losses consider the amount and timing of payments, a credit loss arises even if the entity expects to be paid in full but later than when contractually due.

IFRS 9 B5.5.29

For financial assets, a credit loss is the present value of the difference between:

1. the contractual cash flows that are due to an entity under the contract; and

2. the cash flows that the entity expects to receive.

IFRS 9 B5.5.30

For undrawn loan commitments, a credit loss is the present value of the difference between:

1. the contractual cash flows that are due to the entity if the holder of the loan commitment draws down the loan; and

2. the cash flows that the entity expects to receive if the loan is drawn down.

IFRS 9 B5.5.31

An entity's estimate of expected credit losses on loan commitments shall be consistent with its expectations of drawdowns on that loan commitment, i.e. it shall consider the expected portion of the loan commitment that will be drawn down within 12 months of the reporting date when estimating 12-month expected credit losses, and the expected portion of the loan commitment that will be drawn down over the expected life of the loan commitment when estimating lifetime expected credit losses.

IFRS 9 B5.5.32

For a financial guarantee contract, the entity is required to make payments only in the event of a default by the debtor in accordance with the terms of the instrument that is guaranteed. Accordingly, cash shortfalls are the expected payments to reimburse the holder for a credit loss that it incurs less any amounts that the entity expects to receive from the holder, the debtor or any other party. If the asset is fully guaranteed, the estimation of cash shortfalls for a financial guarantee contract would be consistent with the estimations of cash shortfalls for the asset subject to the guarantee.

IFRS 9 B5.5.33

For a financial asset that is credit-impaired at the reporting date, but that is not a purchased or originated credit-impaired financial asset, an entity shall measure the expected credit losses as the difference between the asset's gross carrying amount and the present value of estimated future cash flows discounted at the financial asset's original effective interest rate. Any adjustment is recognised in profit or loss as an impairment gain or loss.

IFRS 9 B5.5.34

When measuring a loss allowance for a lease receivable, the cash flows used for determining the expected credit losses should be consistent with the cash flows used in measuring the lease receivable in accordance with IAS 17 Leases.

The present value of cash shortfalls is the value used to calculate credit losses. Cash shortfalls for financial assets, loan commitments, financial guarantee contracts, credit-impaired financial assets and lease receivables are determined as specified in B5.5.29 – B5.5.34.

IFRS 9 5.5.17

An entity shall measure expected credit losses of a financial instrument in a way that reflects:

1. an unbiased and probability-weighted amount that is determined by evaluating a range of possible outcomes;

2. the time value of money; and

3. reasonable and supportable information that is available without undue cost or effort at the reporting date about past events, current conditions and forecasts of future economic conditions.

IFRS 9 B5.5.42

Paragraph 5.5.17(a) requires the estimate of expected credit losses to reflect an unbiased and probability-weighted amount that is determined by evaluating a range of possible outcomes. In practice, this may not need to be a complex analysis. In some cases, relatively simple modelling may be sufficient, without the need for a large number of detailed simulations of scenarios. For example, the average credit losses of a large group of financial instruments with shared risk characteristics may be a reasonable estimate of the probability-weighted amount. In other situations, the identification of scenarios that specify the amount and timing of the cash flows for particular outcomes and the estimated probability of those outcomes will probably be needed. In those situations, the expected credit losses shall reflect at least two outcomes in accordance with paragraph 5.5.18.

IFRS 9 B5.5.44

Expected credit losses shall be discounted to the reporting date, not to the expected default or some other date, using the effective interest rate determined at initial recognition or an approximation thereof. If a financial instrument has a variable interest rate, expected credit losses shall be discounted using the current effective interest rate determined in accordance with paragraph B5.4.5.

IFRS 9 B5.5.49

For the purpose of this Standard, reasonable and supportable information is that which is reasonably available at the reporting date without undue cost or effort,

including information about past events, current conditions and forecasts of future economic conditions. Information that is available for financial reporting purposes is considered to be available without undue cost or effort.

The calculation process for determining ECL includes the following requirements:

- losses are calculated for probability-weighed outcomes, considering a minimum of two scenarios;

- ECL should be discounted to the reporting date using the EIR determined at initial recognition;

- reasonable and supportable information available without undue cost or effort needs to be taken into account.

IFRS 9 B5.5.35

An entity may use practical expedients when measuring expected credit losses if they are consistent with the principles in paragraph 5.5.17. An example of a practical expedient is the calculation of the expected credit losses on trade receivables using a provision matrix. The entity would use its historical credit loss experience (adjusted as appropriate in accordance with paragraphs B5.5.51–B5.5.52) for trade receivables to estimate the 12-month expected credit losses or the lifetime expected credit losses on the financial assets as relevant. A provision matrix might, for example, specify fixed provision rates depending on the number of days that a trade receivable is past due (for example, 1 per cent if not past due, 2 per cent if less than 30 days past due, 3 per cent if more than 30 days but less than 90 days past due, 20 per cent if 90–180 days past due, etc.). Depending on the diversity of its customer base, the entity would use appropriate groupings if its historical credit loss experience shows significantly different loss patterns for different customer segments. Examples of criteria that might be used to group assets include geographical region, product type, customer rating, collateral or trade credit insurance and type of customer (such as wholesale or retail).

IFRS 9 B5.5.55

For the purposes of measuring expected credit losses, the estimate of expected cash shortfalls shall reflect the cash flows expected from collateral and other credit enhancements that are part of the contractual terms and are not recognised separately by the entity. The estimate of expected cash shortfalls on a collateralised financial instrument reflects the amount and timing of cash flows that are expected from foreclosure on the collateral less the costs of obtaining and selling the collateral, irrespective of whether foreclosure is probable (i.e. the estimate of expected cash flows considers the probability of a foreclosure and the cash flows that would result from it). Consequently, any cash flows that are expected from the realisation of the collateral beyond the contractual maturity of the contract should be

included in this analysis. Any collateral obtained as a result of foreclosure is not recognised as an asset that is separate from the collateralised financial instrument unless it meets the relevant recognition criteria for an asset in this or other Standards.

Practical expedients may be used when measuring ECL as long as the principles of paragraph 5.5.17. are maintained.

Collateralised financial instruments need to reflect the amount and timing of cash flows that are expected from foreclosure on the collateral, less the costs associated with obtaining and selling the collateral.

IFRS 9 B5.5.4

In some circumstances an entity does not have reasonable and supportable information that is available without undue cost or effort to measure lifetime expected credit losses on an individual instrument basis. In that case, lifetime expected credit losses shall be recognised on a collective basis that considers comprehensive credit risk information. This comprehensive credit risk information must incorporate not only past due information but also all relevant credit information, including forward-looking macroeconomic information, in order to approximate the result of recognising lifetime expected credit losses when there has been a significant increase in credit risk since initial recognition on an individual instrument level.

IFRS 9 B5.5.5

For the purpose of determining significant increases in credit risk and recognising a loss allowance on a collective basis, an entity can group financial instruments on the basis of shared credit risk characteristics with the objective of facilitating an analysis that is designed to enable significant increases in credit risk to be identified on a timely basis. The entity should not obscure this information by grouping financial instruments with different risk characteristics. Examples of shared credit risk characteristics may include, but are not limited to, the:

1.   instrument type;

2.   credit risk ratings;

3.   collateral type;

4.   date of initial recognition;

5.   remaining term to maturity;

6.   industry;

7.   geographical location of the borrower; and

> 8. the value of collateral relative to the financial asset if it has an impact on the probability of a default occurring (for example, non-recourse loans in some jurisdictions or loan-to-value ratios).

Collective assessments should be performed for exposures to which the following applies:

- reasonable and supportable information is not available without undue cost or effort to measure lifetime losses for individual instruments;

- such exposures can be grouped on the basis of shared credit risk characteristics (see IFRS 9 B5.5.5 for examples of characteristics).

The bank team also reviews the model validation reports and other relevant information to assess the adequacy of model validation, backtesting and calibration as well as input and output processes. These steps are carried out on the basis of T7B.

7.5 Challenger model

7.5.1 Inputs

Templates T7L & T7A cover the full set of data required for the challenger model calculations, while T7B records the results of the challenger model analysis.

T7L contains loan tape data:

- Two loan tape snapshots are to be provided by the banks. These loan tapes are an augmented version of the loan tapes provided in workblock 2. Augmented information includes AQR risk buckets and staging information.

- The exact data fields required depend on the portfolio type (e.g. corporate portfolios require debtor level data in addition to facility level data).

To reduce the strain on the Excel-based challenger model, loans should be aggregated before completing the model (see example calculation for AQR loan tape data aggregation for guidance).

The bank team must comply with certain requirements when collecting data for loan tape template T7L:

- The loan tapes created in WB2 (final version post-DIV) form the basis for the T7L data, i.e. T7L is completed by transferring loan tape data from WB2 to T7L and augmenting it for those fields not required in WB2. As such, T7L needs to be consistent with the loan tapes created in WB2. Any changes must be documented, justified, validated via the CPMO and potentially re-introduced into WB2.

- For QA purposes, it may be of interest for banks to prepare and include further snapshots in T7L granularity. In particular, this is true where the last year preceding the reporting date is not considered representative of migration behaviour commonly observed for the portfolio. These snapshots must be consecutive and run up to the two most recent years. Early preparation of loan tapes may reduce the time required for later QA.

- T7L lists all required data fields and provides a standardised approach to loan tape submission. All required data fields are defined in detail in the explanatory sections of T7L. Data definitions also include a requirement for data type (numeric, text, …). Most data requested in T7L are mandatory – some data fields are optional under certain circumstances, indicated clearly in the template. Data are to be submitted at facility level.

AQR risk buckets are added to the T7L loan tape based on DPD data, AQR risk categories (S_RISKCT) and NPE12M flags. Loans are categorised into specific risk buckets according to the rules laid out in **Table 93** below. Contracts are always assigned to the lowest risk bucket for which they fulfil the criteria.

Table 93
Rules for categorisation of loans into specific risk buckets

Risk bucket	Categorisation rules
1	S_RISKCT = 1
2	S_RISKCT = 2
3	S_RISKCT = 3
4	S_RISKCT = 4
5	S_RISKCT = 5
Cured	DPD = 0 AND NPE12M = 1 (default in last 12 months)
1–30 DPD	DPD > 0 AND DPD $\leq$ 30
31–60 DPD	DPD $\geq$ 31 AND DPD $\leq$ 60
61–90 DPD	DPD $\geq$ 61 AND DPD $\leq$ 90
D 91–180	(DPD $\geq$ 91 AND DPD $\leq$ 180) OR NPEEBA = 1 OR NPEINT = 1
D 180+	DPD > 180 OR NPEEBA = 1 OR NPEINT = 1

T7A contains general calculation inputs:

- the segmentation which is to be applied to the portfolio;

- EAD run-down curves for each risk bucket in each segment;

- macroeconomic conditioning parameters to be provided by the bank for the next ten years;

- recovery data for retail other portfolios;

- sales log data for retail mortgage portfolios.

Segmentation

Segmentation in the challenger model is based on a number of predefined segmentation criteria provided in T7A:

- AQR asset segment;

- product type;

- channel;

- LTV bucket;

- maturity bucket.

The bank team specifies in T7A which criteria are applied for the segmentation of a given parameter and outlines the reasoning behind this. The granularity of the criteria provided (see above) is expected to suffice for most banks. However, two freely definable fields have also been added for flexibility of segmentation (S_OTHER, S_OTHER2). Alternative approaches may be proposed to the CPMO where the bank team deems that they are a better fit for the portfolio's characteristics, for example in cases where a portfolio has very few defaults or where the exposures in a segment are considered to be heterogeneous.

EAD run-down profiles

The bank is required to provide run-down profiles for contractual EAD to be recorded by the bank team in T7A. Three sets of run-down curves are requested in the template for each AQR risk bucket in each segment:

- The **contractual EAD** run-down should reflect the bank's expectations for overall exposure based on loan conditions. These data are used for QA. A run-down curve in the context of this exercise is a sequence of exposure values over the next ten years.

- **Contractual EAD including prepayments** should reflect banks' expectations for overall exposure after contractual EAD is adjusted for prepayment assumptions. These data are used for QA. Prepayments for the purpose of this exercise are any form of payment ahead of contractual terms.

- **Contractual EAD including prepayments and draw-down of off-balance-sheet exposures** should also factor in off-balance-sheet and CCF assumptions. This data set is used in further calculations. The CCF is set in line with CRR (CCF for standardised portfolios: only 0pct, 20pct, 50pct, 100pct. No restriction in values for IRB portfolios).

Z and R factors for macroeconomic scenarios

To address the IFRS 9 requirement to calculate provisions on the basis of "expected" rather than "most likely" outcomes, ECL are calculated for multiple scenarios and the outputs then combined in a final, probability-weighted result. The challenger model accounts for this by allowing input variables to be entered and outputs calculated for up to three scenarios for each model instance. These scenarios are a base scenario, an adverse scenario and an optional internal scenario which can be defined by the bank and will be a focus of QA if used.

In these scenarios, PD is conditioned using a Vasicek/Merton-style approach to matrix conditioning. Vasicek conditioning uses Z factors (which adjust base PD for macroeconomic conditions) and R factors (which correlate a specific asset group with the observed macroeconomic conditions). Template T7A requires the bank team to work with the bank to provide sets of Z&R values for each scenario. Section 7.5.3 describes the multi-scenario analysis and the derivation of Z&R values in more detail.

7.5.2 ECL calculation overview

The challenger model consists of a core ECL calculation based on five parameter satellite models that draw input data from templates T7L and T7A.

Figure 7
ECL calculation
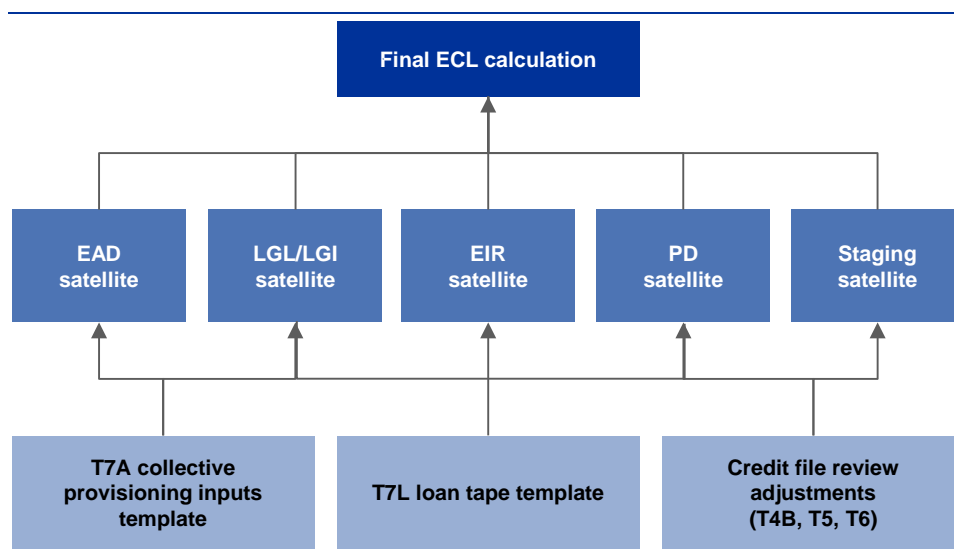
The challenger model is calibrated on the bank's own data as included in T7A and T7L. If the bank's data are insufficient, fall-back parameters may be used. Basic fall-back parameters (e.g. fall-back migration matrices) are provided by the CPMO, but NCAs may propose alternative parameters based on objective analysis for their country. The results of the challenger model calculation are recorded in T7B.

The outputs of the five parameter satellite models are listed in **Table 94**.

Table 94

Outputs of the satellite models

Satellite model	Output
PD	The PD satellite outputs marginal probabilities of default, reflecting the net effect of cures and defaults in a given period.
LGL/LGI	The LGL satellite outputs LGL for retail portfolios. LGL excludes the possibility of cure.
	The LGI satellite outputs LGI for corporate portfolios. LGI assumes contracts are currently impaired, but can cure at later points in time.
EAD	The EAD satellite outputs EAD including prepayment and CCF assumptions.
EIR	The EIR satellite outputs a discount factor for use in the ECL calculation. The discount factor is derived from average exposure-weighted EIRs for each segment.
Staging	The staging satellite outputs exposure-based stage distributions for each segment. Stage distributions describe the percentage of exposure in a given segment that are assigned to IFRS 9 stages 1, 2 and 3.

For consistency and to avoid double-counting, the effect of cures on ECL should only be captured in provisioning once (i.e. not in both LGL/LGI and PD). The challenger model captures the effect of cures in either PD or LGL/LGI depending on the portfolio type:

Retail portfolios

The challenger model for retail portfolios uses marginal PDs from the PD satellite together with LGL from the LGL satellite in the ECL calculation. Cures are captured in the PD satellite during the creation of raw migration matrices that contain a specific "cure" risk bucket. The PD satellite extracts marginal PDs from these cure-containing raw migration matrices. These marginal probabilities closely approximate the marginal probability of loss. Double-counting of cures is prevented by determining LGL rather than LGI. LGL assumes an exposure can no longer cure.

Corporate portfolios

For corporate portfolios, cures are captured in the LGI satellite. LGI is calculated here as the average provision divided by exposure for exposures that have become NPEs in the last 12 months. Since average provisions by definition take cures into account, LGI already takes cures into account. Double-counting of cures in the PD satellite is prevented by excluding cure migrations: the probabilities of moving into cure and out of cure are set to 0 in the raw migration matrix extrapolated from the loan tape. The PD satellite produces marginal PDs irrespective of cure behaviour.

7.5.3   PD

This section describes the PD satellite model:

- data required;

- sub-segmentation to be applied;

- calculation approach;

- example calculations.

7.5.3.1 Data required

The following data are required:

Loan identifiers are required to track loans through multiple snapshots:

- facility ID (for retail) (R_IDFF);

- snapshot date (R_SNAPF);

- debtor ID (R_IDFD) – for corporate portfolios.

Exposure data are required to create the exposure-weighted migration matrix:

- total exposure (E_ONBAL + E_OFFBAL*CCF).

Segmentation criteria are required to assign exposures to the correct sub-segment:

- AQR asset segment (S_AQRASF);

- product (i.e. type of product e.g. auto loan) (B_PROD);

- channel (broker vs non-broker for retail mortgages and retail other only) (B_CHAN);

- LTV bucket (S_LTVBKT);

- remaining time to maturity bucket (S_MATBKT);

- bank-defined segmentation (S_OTHER);

- bank-defined segmentation 2 (S_OTHER2).

Other data:

- AQR risk bucket(S_RSKBKT).

7.5.3.2 Sub-segmentation

PD should be calculated at a sub-segment level. The dimensions for sub-segmentation are:

Table 95

Product-based segmentation

AQR asset segment	Product segmentation
RRE	Primary domestic home; buy to let; second home
Other retail	e.g. credit card; overdraft; unsecured loan; auto loan and lease; other *(note – specific segments are not prescriptive but used as an indication)*
Retail SME	e.g. asset-based lending; trade receivables; other secured; unsecured *(note – specific segments are not prescriptive but used as an indication)*
Corporate (large and SME) and project finance	None
Shipping, aviation, CRE	None

Table 96

LTV-based segmentation (where LTV is calculated based on indexed last valuation)

AQR asset segment	LTV segmentation
RRE	0-60%, 60-80%, 80-100%,100-120%, 120%+, unknown/error
Other retail (excl. other secured loans)	None
Other secured loans (retail)	None
Retail SME	None
Corporate (large and SME) and project finance	None
Shipping, aviation, CRE	0-60%, 60-80%, 80%+, unknown

Table 97

Channel-based segmentation

AQR asset segment	Channel segmentation
RRE	Broker, other
Other retail	Broker, other
Retail SME	N/A
Corporate (large and SME) and project finance	N/A
Shipping, aviation, CRE	N/A

The challenger model defines sub-segments by concatenating the segmentation criteria selected, i.e. SEG = product & LTV bucket & channel.

7.5.3.3 Calculation approach

The PD satellite derives marginal PDs using a migration matrix-based calculation approach which entails the following main steps:

- **raw matrix calculation:** generation of raw migration matrices from migration data;

- **matrix conditioning calculation:** conditioning of matrices for macroeconomic scenarios;

- **marginal PD calculation:** generation of cumulative multi-year matrices from conditioned matrices and extrapolation of marginal probabilities of impairment from the multi-year matrices.

For simplification, the challenger model uses the following assumptions:

- The challenger model approach only uses a single annual migration. It assumes that the migration between snapshots T_{-1} and T_0 accurately captures the current macroeconomic conditions, leading to a stable and representative through-the-cycle (TTC) migration matrix for Vasicek conditioning of migration matrices.

- Disappearing contracts are contracts which are present in snapshot T_{-1} but not in T_0 even though their remaining time to maturity is more than 12 months. The challenger model assumes that disappearing contracts behave in a similar way to regular contracts, meaning no special treatment is required. The relevant contracts are effectively removed from observation, as their exposures are not listed in the migration data.

- Segment changing occurs when a contract switches segments between snapshots. The challenger model assumes segment changing is a rare phenomenon and therefore has no material impact on provisions. As a result, no specific treatment is introduced for these contracts (the original segment is used in the calculation).

- Matrix stability, segment changing and contract disappearance are focus points during QA. If too many contracts are found to leave the portfolio, the bank team should first request higher-quality data from the bank. If the bank is unable to provide higher-quality data, the segmentation granularity should be reduced to ensure adequate sample sizes for the challenger model calculations. Unexpectedly high irregular exposures may hint at further DIV requirements and/or requirements to implement an additional smoothing step.

Raw matrix calculation

A raw exposure matrix is generated from the migration data from T7L for each sub-segment (format 11x11 for the 11 AQR risk buckets). Each row of the migration matrix is normalised, producing a percentage-based migration matrix with rows summing to 100%. Intra-year migrations are disregarded, in other words a contract moving from risk bucket 1 to risk bucket 3 and then back to risk bucket 1 within a year is counted as a migration from risk bucket 1 to risk bucket 1.

Matrix conditioning calculation

Raw migration matrices are deconditioned using the Vasicek deconditioning formula:

$$PD_{TTC} = \Phi(\Phi^{-1}(\text{PD}_{\text{PiT}}) * \sqrt{1-R} - \sqrt{R} * z$$

A TTC matrix is then created as the simple average of deconditioned matrices. The TTC matrix is conditioned for forecasted economic conditions 1-10 years into the future based on the Vasicek conditioning formula:

$$PD_{PiT} = \Phi(\frac{\Phi^{-1}(PD_{TTC}) + \sqrt{R} * z}{\sqrt{1 - R}}$$

The challenger model assumes that a ten-year forecast period is sufficient to capture the expected lifetime loss at the intended accuracy for most conceivable portfolios. The bank team should confirm that significant losses are not expected to take place further into the future, and propose adjustments to the ECL calculation where required.

Multiple sets of Vasicek R- and Z-values can be used to create scenarios. A slight variation of the above formula is used for non-default migrations. In this variation, the cumulative probability of reaching the target risk bucket or a risk bucket worse than the target replaces PD_{PiT} in the formula. Consecutive cumulative probabilities are then subtracted to obtain the probability of migrating to the target risk bucket.

Marginal PD calculation

The Vasicek-conditioned matrices are multiplied to create cumulative multi-year matrices. Cumulative PD can be derived from a multi-year matrix as the sum of migration probabilities into risk buckets "D 90-180" and "D 180+". The marginal PD for year i is defined as the difference between the cumulative probabilities of entering into those buckets for year i and i_{-1}. The marginal PDs for each segment in each forecasted year feed into the core ECL calculation.

7.5.3.4   Example calculations

The challenger model contains example calculations for each element of the PD satellite (raw matrix calculation, matrix conditioning calculation, marginal PD calculation and collection of marginal PDs for core ECL calculation).

Additional step-by-step examples are provided in separate Excel files for the raw matrix calculation and the matrix conditioning calculation.

7.5.4   LGL for retail exposures

The approach for determining LGL differs for retail mortgages compared with other segments. For retail mortgages, a structural approach is applied based on collateral value (including the impact of third-party-provided mortgage indemnity guarantees (MIGs). For other segments, a simpler approach is applied based on observed recoveries.

This section describes the different approaches for retail mortgages and other retail segments:

- data required;

- sub-segmentation to be applied;

- calculation approach;

- example calculations.

7.5.4.1 Retail mortgages LGL

7.5.4.1.1 High-level framework

The LGL framework for retail mortgages essentially involves deducting the discounted value of the property collateral from the outstanding balance at default, taking into account:

- overestimation of appraisal values (assessed based on findings of appraisal by independent external party);

- sales discounts on appraisal values following foreclosure;

- volatility in recoveries;

- direct costs (e.g. auction fees, appraisal fees, etc.);

- accrued interest/discounting of recoveries;

- over-optimistic appraisals.

This is illustrated in the figure below:

Figure 8
Illustration of retail mortgages LGL framework
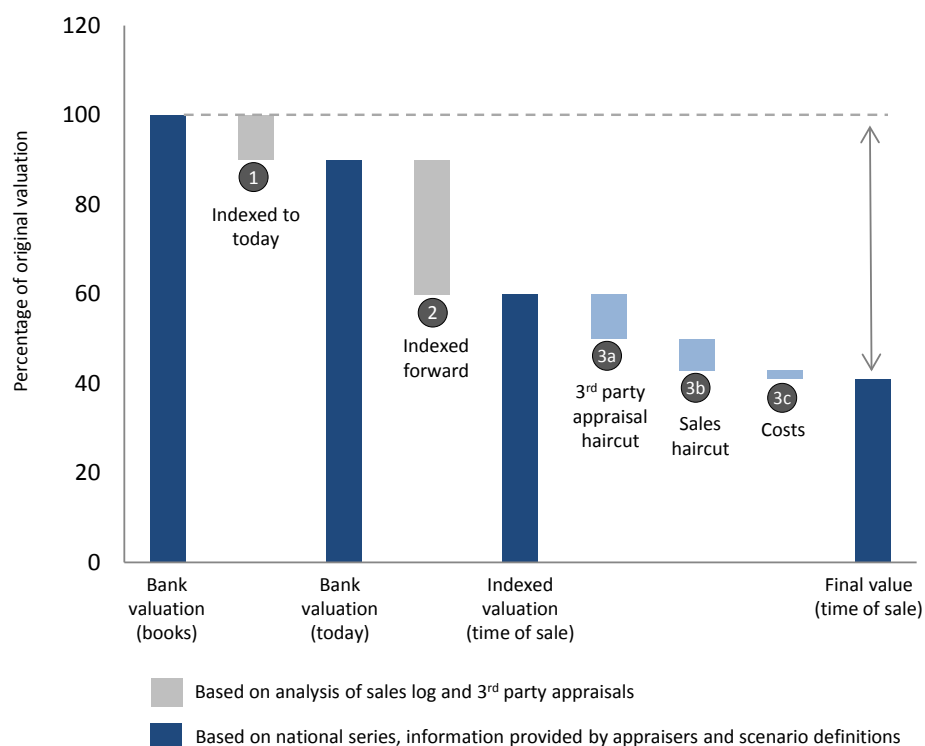
7.5.4.1.2   Data required

Three types of data are required for the analysis: 1) loan tape data, 2) findings from reappraisal of properties and 3) data on historical recoveries.

1.   Loan tape data

The following loan tape data are required to determine the indexed LTV for each facility in the current portfolio:

- total on-balance-sheet exposure (E_ONBAL); [$ONBAL_{20XX}$];

- total off-balance-sheet exposure (E_OFFBAL); [$OFFBAL_{20XX}$];

- CCF (E_CCF);

- valuation at last appraisal (C_VAL);

- date of last appraisal (C_DATE);

- region (C_REGION).

2.   Findings of appraisal by independent external party

It is necessary to understand the difference between property value appraisals by an independent external party and indexed bank appraisals, differentiated where appropriate by the time of appraisal. This information comes directly from the credit file review.

3.   Data on historical recoveries

Additional data are required on all foreclosure cases in the last 36 months:

- sales proceeds;

- last appraisal value;

- date of appraisal;

- date of sale;

- costs incurred in sale.

50 foreclosure cases for each sub-segment are considered sufficient for the purposes of this analysis. It is not acceptable to disregard foreclosure cases on the basis that they are exceptional – foreclosure cases are exceptional by definition.

7.5.4.1.3   Sub-segmentation to be applied

The LGL calculation is segmented by LTV and remaining time to maturity.

The parameters sales ratio, costs and EIR do not need to be segmented to reduce complexity and deal with sparse data if required.

7.5.4.1.4   Calculation approach

The indexed LTV for an array i to the point of default ($LTVI_i$) is defined as follows:

- $LTVI_i = (LTVA_i*(1 + Costs) *(1 + EIR)$^Time to sale$)/((Index\ to\ today_x)*(Index\ to\ sale_x)*(1 + Appraiser\ discount))$;

- $LTVA_i$ = current on and off-balance-sheet exposure/property value at appraisal;

- Appraiser discount = average difference between the last bank appraisal indexed to the date of appraisal and the property value appraisal by an independent external party for the AQR sample of residential property;

- Costs = average foreclosure expenses as a percentage of exposure (e.g. appraisal fees);

- Time to sale = observed average time to sale in years;

- Index to today = average property price for the region today/average property price for the region as at the date of appraisal;

- Index to sale = 1 – forward-looking change to house price index (HPI) for the region (to be communicated by the ECB for each region).

The discount rate used should be the EIR.

The LGL is then calculated from LTVI$_i$ using the formula below (applying Excel notation for transparency).

LGL=(LTVIi-((1-NORMDIST(LTVIi,SALES,SALES_VOL,TRUE))*LTVIi-0.5*SALES*ERF((SALES-LTVIi)/(SQRT(2)*SALES_VOL))-(SALES_VOL/SQRT(2*PI()))*EXP(-(((SALES-LTVIi)/(SQRT(2)*SALES_VOL))^2))+SALES/2-(-0.5*SALES*ERF((SALES)/(SQRT(2)*SALES_VOL))-(SALES_VOL/SQRT(2*PI()))*EXP(-(((SALES)/(SQRT(2)*SALES_VOL))^2))+SALES/2)))/LTVIi

- SALES = average sales ratio for the segment;

- SALES_VOL = standard deviation of sales ratios for observed sales in a segment.

The formula has been fully implemented in the accompanying Excel example, making implementation straightforward. The formula above appears complex but is simply a continuous quantitative means of ensuring that regardless of the indexed LTV, the collective provision is equal to or greater than 0 as illustrated in the figure below. The figure below is based on an expected 10% fall in property prices and the fall-back parameters described below.

Figure 9
Illustration of LGL formula
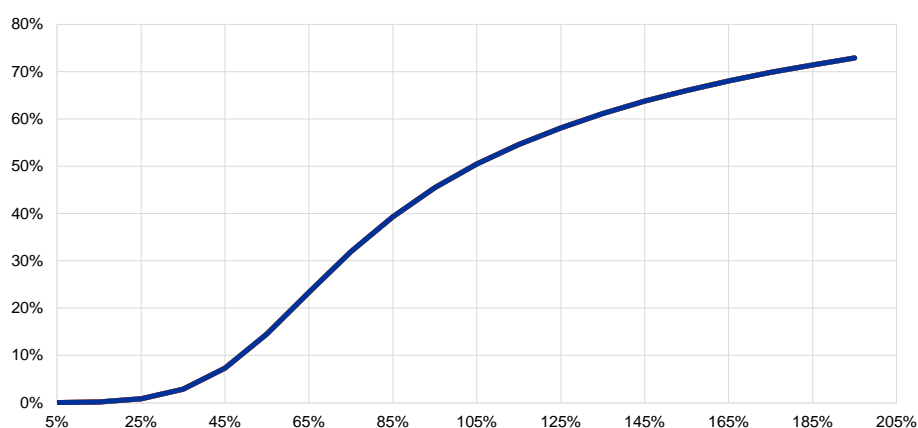
The approach for defining each parameter is described below together with an example calculation for each component. If sufficient data are not available to

populate the above formula for a given segment, the following prudent assumptions should be used:

- sales ratio (SALES) = 75%;

- sales ratio volatility (SALES_VOL) = 18%;

- costs (COST) = 5%;

- time to sale (T) = 3 years;

- property price projection = [to be provided by ECB for each region];

- EIR = 4%.

The specific parameterisation approach for each of the parameters is described below. Please also refer to the example calculation provided in "*LGL illustration – mortgages.xls*".

To account for the different macroeconomic scenarios to be reflected in the ECL calculation, the results of the base LGL calculations are adjusted in line with the approach for adjusting LGD that is applied in ECB stress test exercises, i.e. by applying adjustment factors derived from historically observed correlations between LGL and key macroeconomic variables. The relevant calculations are provided by the CPMO during the exercise. The scenario-adjusted LGL values then feed into the core ECL calculation in the challenger model.

The challenger model uses the basic assumption that LGL remains constant across the ten-year horizon analysed. Where this is expected to lead to distortions due to variations in remaining time to maturity, the bank team should propose appropriate adjustments.

7.5.4.1.5   Appraiser discount

The appraiser discount is calculated based on the findings of the reappraisal of the sample of exposures. It is the average % reduction in the bank's indexed valuation compared with the valuation by the independent external party, as shown in the example below:

- Bank valued a property at €100,000 at t_{-3}.

- The property index fell by 20% between t_{-3} and t_0.

- This implies that the bank's indexed valuation is €80,000.

- An independent external party values the property at €75,000, implying an appraiser discount of -6.25% on this property.

The average appraiser discount for the sample should be value-weighted. If appropriate, the appraiser discount may be differentiated by sub-segment at the bank team's discretion (as illustrated in the accompanying Excel example).

Application of the appraiser discount is subject to a materiality threshold of 5% at portfolio level. Specifically, if the application of the appraiser discount as described above results in a change in collateral value of less than 5% across the total portfolio, then it should not be applied. In this case, updated property values for properties directly reappraised as part of the AQR should still be used.

7.5.4.1.6 Sales ratio (SALES)

The sales ratio is calculated based on sales log data by comparing the indexed last valuation with the observed proceeds for completed property sales following foreclosure. The sales ratio for a given property is simply the observed proceeds divided by the indexed valuation. Any double-counting with the appraiser discount should be eliminated by adjusting the indexed valuation for the appraiser discount.

The sales log should be analysed to determine average sales ratios to be applied across the performing and non-performing portfolio. Sales ratios may be calculated by segment where relevant/possible. Sales ratios should be value-weighted.

A worked example is included in Table 3 and Table 4 of the "Parameter Calcs" tab of the "*LGL illustration-mortgages.xls*" spreadsheet.

7.5.4.1.7 Sales ratio volatility (SALES_VOL)

The sales ratio volatility is calculated based on the same data as the sales ratio and is simply the standard deviation of the observed sales ratios for the sales log for each sub-segment. The bank team may differentiate sales ratio volatility by collateral value and region where differentiation appears meaningful.

A worked example is included in Table 3 and Table 4 of the "Parameter Calcs" tab of the "*LGL illustration-mortgages.xls*" spreadsheet.

7.5.4.1.8 Costs (COST)

Average costs as a percentage of exposure should be calculated as the average observed costs divided by the average exposure for all resolved cases. Unresolved cases, in other words cases where a sale has not been completed, should be excluded.

Again, a worked example is provided.

7.5.4.1.9 Time to sale (T)

Time to sale is the average time between a mortgage default and the sale of the underlying property. This may be difficult to observe from data given the correct censoring of data (time to sale can't be fully observed for a default cohort until all cases have been resolved, which will take a very long time) and specific issues relating to foreclosure processes in particular markets (e.g. legal moratoria). Time to sale may therefore be set on the basis of an expert judgement that takes account of the bank's processes, the current legal context and available data.

7.5.4.1.10 EIR

The EIR should be defined in line with IFRS 9. In the absence of data, an average EIR may be applied across a portfolio or sub-segment at the bank team's discretion for the purposes of parameterising the challenger model.

7.5.4.1.11 Impact of MIGs

Where the bank uses MIGs to mitigate losses, the LGL should be reduced by an appropriate amount that reflects the MIGs, based on the probability that claims will be successful and the level of the cover. If reliable statistics on claim success rates are not available, MIGs should be ignored unless objective evidence suggests otherwise.

7.5.4.2 Example calculation

An example calculation has been provided in "*LGL illustration – mortgages.xls*".

7.5.4.3 LGL for other retail

7.5.4.3.1 Data required

The following data are required for all facilities where a write-off has occurred in the last 36 months:

- observed cumulative recoveries as a percentage of the outstanding balance on cases with write-offs;

- segmentation information (i.e. product type).

If no data are available, the following benchmarks should be applied:

- 60% for secured products;

- 90% for unsecured products.

For the avoidance of doubt, the approach is not materially influenced by differences in the bank's write-off policy as the analysis is focused on cash recoveries from write-offs rather than the level of the write-off. If the bank is relatively quick to write off exposures then the cure rate will be lower and the cash recoveries that influence LGL will be higher, but in combination the implied provision should be largely indifferent to the write-off policy that has been used.

7.5.4.3.2 Sub-segmentation to be applied

The specific segmentation applied is constrained by the available data. The most important segmentation dimension is product type. The following product segments are suggested (if possible):

- personal loans;

- overdrafts;

- credit cards;

- asset-based lending (if relevant);

- auto finance;

- other retail non-SME secured;

- other retail SME secured;

- other retail SME unsecured.

7.5.4.3.3 Calculation approach

Average recoveries from cases with write-offs should be directly observed for each product segment. Assumptions can be arrived at directly from the bank's analysis of recoveries (e.g. from collections departments), to the extent that they are not influenced by recoveries from cases that would be considered cures. As such, the approach for this segment is only prescribed to a limited extent. Instead, an illustrative example is used to indicate how the calculation should be performed. Data on recoveries should be assessed carefully to ensure that practices such as loan sales do not influence the results (in this case a loan sale should be treated as a recovery equal to the sale price).

Cumulative recoveries from personal loans with write-offs are shown below. For the bank in question, movement to late-stage collections would be accompanied by a write-off and the client would therefore be viewed as "non-cure". The LGL can then

simply be read off from the average long-term recoveries by default cohort. Based on the example below, an LGL of 98% is assumed.

Figure 10

Analysis of cumulative recoveries from write-off cases
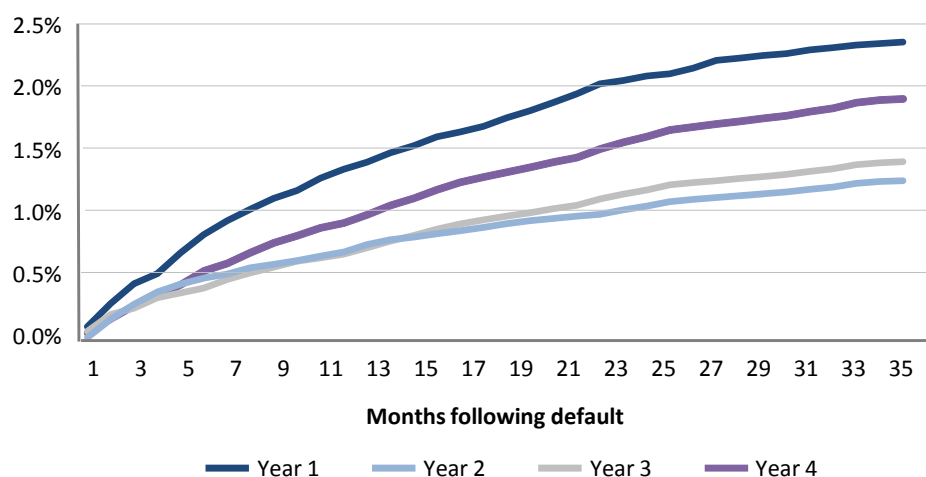
Where the sale of loans is the predominant approach for dealing with late-stage collections, sale prices should be used as a proxy for LGL. Some misalignment between the definitions used in cash recovery analysis and those used in cure rate analysis is to be expected. Bank teams should ensure that any simplifications applied in arriving at LGL assumptions do not unduly influence the outcome of the analysis. In the example above it can be stated with confidence that including cures in the recovery data would not unduly affect the outcome as the LGL is so high.

Recoveries should be discounted based on the observed average time between default and recoveries.

To account for the different macroeconomic scenarios to be reflected in the ECL calculation, the results of the base LGL calculations are adjusted in line with the approach for adjusting LGD that is applied in ECB stress test exercises, i.e. by applying adjustment factors derived from historically observed correlations between LGL and key macroeconomic variables. The relevant calculations are provided by the CPMO during the exercise. The scenario-adjusted LGL values then feed into the core ECL calculation in the challenger model.

The challenger model uses the basic assumption that LGL remains constant across the ten-year horizon analysed. Where this is expected to lead to distortions due to variations in remaining time to maturity, the bank team should propose appropriate adjustments.

7.5.4.3.4 Example calculation

An Excel example of the calculation is attached to the manual (*"LGL illustration – Retail other.xls"*).

7.5.5 LGI for non-retail exposures

This section describes:

- data required;

- sub-segmentation to be applied;

- calculation approach;

- example calculation.

7.5.5.1 Data required

The following data are required, all of which are available in the loan tape:

- on-balance-sheet exposure (E_ONBAL);

- off-balance-sheet exposure (E_OFFBAL);

- CCF (E_CCF) (with the above used to calculate exposure at debtor level (D_EXP));

- Stage 3 (credit-impaired) provisions (P_CI)

- relevant segment information (e.g. product) (S_AQRSD);

- LTV (D_LTV).

7.5.5.2 Sub-segmentation approach

Parameters should be segmented by indexed LTV as follows:

LTV (where LTV is calculated based on indexed last valuation) and determined at debtor level

Table 98

LTV-based segmentation

AQR asset segment	LTV[1] segmentation
Corporate (large and SME) and project finance	0–60%, 60–80%, 80–100%,100–150%, 150–200%, 200%+, unknown/no collateral
Shipping, aviation, CRE	0–60%, 60–80%, 80–100%,100%+, unknown/no collateral

1) V is total indexed collateral value

Sub-segments with immaterial exposure or where the segment cannot be defined need not be analysed separately but can be grouped with the most appropriate other sub-segment.

7.5.5.3 Calculation approach

LGI is determined by calculating the average provision divided by exposure for exposures that have become credit-impaired in the last 12 months by sub-segment. The analysis is exposure-weighted and should be adjusted for extrapolated findings from file reviews, i.e. average provision after AQR adjustments. Where data in a given segment are too sparse to produce reliable assumptions, segments should be merged with similar sub-segments.

LGL/LGI is adjusted according to macroeconomic scenarios.

To account for the different macroeconomic scenarios to be reflected in the ECL calculation, the results of the base LGI calculations are adjusted in line with the approach for adjusting LGD that is applied in ECB stress test exercises, i.e. by applying adjustment factors derived from historically observed correlations between LGD and key macroeconomic variables. The relevant calculations are provided by the CPMO during the exercise. The scenario-adjusted LGI values then feed into the core ECL calculation in the challenger model.

The challenger model uses the basic assumption that LGI remains constant across the ten-year horizon analysed. Where this is expected to lead to distortions due to variations in remaining time to maturity, the bank team should propose appropriate adjustments.

7.5.5.4 Example calculation

An illustration of the calculation is shown in the accompanying spreadsheet *"LGI illustration.xls"*.

7.5.6 EAD

Data required

- Banks provide run-down profiles for three sets of EADs:

  - contractual EAD;

  - contractual EAD including prepayments;

- contractual EAD including prepayments and draw-down of off-balance-sheet exposures.

- Contractual EAD including prepayments and draw-down of off-balance-sheet exposures is used in the ECL calculation.

- EAD curves are a focus of attention during QA.

Sub-segmentation

- EAD sub-segmentation is the most granular parameter segmentation in the challenger model. It encompasses all segmentation criteria and sub-segmentations used in the PD, LGL/LGI, EIR and staging satellites.

- Possible segmentation criteria are AQR asset segment, product, channel, LTV bucket and maturity bucket. Two further segmentation criteria may be specified by the bank/bank team and included in the model (S_OTHER, S_OTHER2).

- EAD is also split according to AQR risk bucket.

7.5.7   Staging

Data required

- Total exposure (E_ONBAL+E_OFFBAL*CCF).

- IFRS 9 credit quality stage (B_STAGE).

- Segmentation information in the loan tape.

Sub-segmentation

Staging parameters are provided at the same granularity as EAD, but only for T_0 (the stage distribution is not forecasted into the future as it is only used to determine the current share of exposures requiring lifetime rather than 12-month provisioning).

Auditors should investigate defined segments for material distortion of the staging distribution across the remaining lifetime. In the event of material distortion, the suggestion is to increase the granularity of EAD segmentation by adding remaining time to maturity as a segmentation criterion. Material distortion of the staging distribution across the remaining lifetime can be expected when contracts with different maturities have heterogeneous stage assignments.

Calculation approach

Raw stage distributions are calculated as percentage-based distributions of exposure across the three IFRS 9 credit quality stages for every risk bucket in each segment. The calculation is carried out on all contracts present in loan tape snapshot T_0 (most recently available snapshot). The exposure used in the calculation is total exposure: $E_{total} = E_{onbal} + E_{offbal} * CCF$.

Example calculations

An example calculation for the staging satellite can be viewed in the collective provisioning challenger model. Specifically, the following sheets in the Excel file are relevant:

- **Loan tape input:** input of loan tape data including the stage distribution for each loan tape item:

  - Three fields in the challenger model loan tape describe the staging distribution (%-Stage 1, %-Stage 2 and %-Stage 3).

  - For single loans, one of the three fields is set to 100% (the loan is 100% in its given stage by definition).

  - For aggregated loans, the aggregated loan group may consist of multiple stages. This is indicated by the staging distribution data fields (e.g. 30% in %-Stage 1, 70% in %-Stage 2 and 0% in %-Stage 3).

- **Staging satellite:** stage exposure distributions for each segment are derived from the loan tape for each risk bucket.

7.5.8   EIR

Data required

- Total exposure (E_ONBAL + E_OFFBAL * CCF);

- EIR (B_EFFRAT);

- EAD segment (S_EAD).

Sub-segmentation

The EIR is provided at the same level of granularity as EAD, but only for T_0. The EIR as reported in T7L should differentiate between exposure types in line with IFRS 9 B5.5.44 – B5.5.48. The bank team should investigate defined segments for material distortions in the average segment EIR across the remaining lifetime. In the event of

material distortion, the suggestion is to increase the granularity of EAD segmentation by adding remaining time to maturity as a segmentation criterion. Material distortion of the average segment EIR across the remaining lifetime can be expected when contracts with different maturities have a heterogeneous EIR.

Calculation approach

The EIR is calculated for every risk bucket in each segment as the exposure-weighted average EIR of all contracts in the given segment with the given risk bucket. The calculation is carried out on all contracts present in loan tape snapshot T_0 (most recently available snapshot). Exposure-weighting is carried out with total exposure: $E_{total} = E_{onbal} + E_{offbal} * CCF$.

The EIR is used to discount future cash flows in the ECL calculation. For forecasting year i, the discount factor is derived from the EIR as follows:

$$DiscountFactor_i = \frac{1}{(1 + EIR)^i}$$

The discount factors feed into the core ECL calculation.

Example calculations

An example calculation for the EIR satellite can be viewed in the collective provisioning challenger model. Specifically, the following sheets in the Excel file are relevant:

- **Loan tape input:** the EIR is provided for single loans or as an exposure-weighted average for aggregated loans.

- **EIR satellite:** exposure-weighted averaging of the EIR by risk bucket in each segment.

7.5.9   Incorporation of findings of the credit file review

The findings of the credit file review (workblock 4) need to be incorporated into the challenger model and potentially affect all of the above parameters (except the EIR).

PD adjustments

Where the credit file review finds that NPEs had been misclassified as non-defaulted/performing, this implies that pre-credit file review migration matrices are distorted. Accordingly, PDs that have been calculated based on these matrices need to be adjusted.

Two sets of adjustment factors are used:

- the extrapolated NPE misclassifications as a percentage of the total performing exposure by risk category (sourced from T6 ("Risk Category Results" sheet);

- the percentage of reclassifications where the NPE event occurred during the previous year (sourced from T4B).

The adjustments are performed as follows:

- unadjusted PD is extracted from the migration matrix as the sum of migrations into "D 90-180" and "D 180+" for each risk category;

- the credit file review adjustment is applied to each PD at risk bucket granularity;

- the distance between raw PD and adjusted PD is determined in the distance-to-default space in the collective provisioning challenger model (raw and adjusted PD are moved to the distance-to-default space by applying Excel's NORMSINV functionality and then subtracted);

- following the calculation of this distance between raw and adjusted PD in the distance-to-default space, the full migration matrix is moved to the distance-to-default space (see calculation in challenger model);

- the matrix is then shifted in the distance-to-default space according to the delta determined between raw and adjusted PD;

- in a final step, the shifted matrix is returned to the regular matrix space and fed into the remainder of the PD calculation.

LGL/LGI adjustment

For retail mortgage portfolios, credit file review LGL adjustments (sourced from T5) are determined for each LGL segment as an absolute percentage increase in LGL (see "Retail mortgages LGL calculation illustration" for an example of how the appraiser discount is calculated for each LGL segment).

For non-retail portfolios, the credit file review LGI adjustment (sourced from T6) is calculated as the average level of provision increases (as a percentage of exposure) at portfolio level.

The credit file review LGL/LGI adjustments are then added to the LGL/LGI values determined in the LGL/LGI satellite.

EAD adjustment

Credit file review EAD adjustments are provided as multiplicative factors for each risk bucket. Each factor indicates the share of exposures that remains in the given risk category after credit file review adjustment (share of correctly classified exposures). Credit file review EAD adjustments are provided for risk categories 1-5. The values for the risk buckets "Cured" and "1-30 DPD" are derived by exposure-weighting the

credit file review adjustments for risk categories 1-5 according to the exposure distribution of risk categories in the given risk bucket. For risk buckets assigned to stage 2 or stage 3 ("31-60 DPD", "61-90 DPD", "D 91-180", "D 180+"), the initial credit file review staging adjustment is 100% (100% of exposure already in stage 2 or 3 will remain in stage 2 or 3). The credit file review EAD adjustments are sourced from T6 ("Risk category results" sheet).

The challenger model differentiates between retail and corporate portfolios when applying credit file review adjustments to EAD:

- For retail portfolios, the share of misclassified exposures for a risk bucket in a given segment is calculated as the raw exposure * (1 - EAD adjustment). Misclassified exposures are removed from the pre-credit file review risk bucket they had been assigned to and placed in one of the two default risk buckets (D 90-180, D180+). The ratio for assigning exposures to the two buckets can be adjusted in the "Lookup tables" sheet of the challenger model (may only be changed by the ECB). The default reassignment ratio is 1/3 "D 90-180" and 2/3 "D 180+" (if a loan stops paying on the first day of the year, it will spend 1/3 of its time in default during the year in "D 90-180" and 2/3 in "D 180+").

- For corporate portfolios, the share of misclassified exposures for a risk bucket in a given segment is calculated as the raw exposure * (1 - EAD adjustment). For corporate portfolios, the provisioning for misclassified exposures is already accounted for in the projection of findings workblock. Misclassified exposures are therefore removed from the portfolio (no reassignment to default stages, but the exposures for a given risk bucket in a given segment are reduced by the amount of misclassified exposures).

Staging adjustment

For AQR risk categories 1-5, credit file review staging adjustments are provided as an overwrite of the stage 2 exposure distribution share. For the AQR risk buckets "Cured" and "1-30 DPD", the challenger model proceeds as follows:

- the loans in the "Cured" and "1-30 DPD" buckets all have an assigned underlying risk category;

- the credit file review adjustment for "Cured" and "1-30 DPD" is derived by exposure-weighting the credit file review adjustments for risk categories 1-5 according to the exposure distribution of risk categories in a given risk bucket.

For risk buckets assigned to stage 2 or 3 ("31-60 DPD", "61-90 DPD", "D 90-180", "D 180+"), the credit file review staging adjustment is 0%.

The credit file review-adjusted stage 2 share is applied to the exposure distribution by overwriting the raw stage 2 share. The increase in stage 2 is offset by an equal decrease in stage 1 in the staging distribution. The percentage of exposure in stage 3 remains unaffected by this adjustment. The credit file review staging adjustment is

sourced from the risk category results sheet of T6 for both retail and non-retail portfolios.

7.5.10   Adjustment for one-off effects

Due to the requirements of the exercise, the challenger model is built using a short data history, meaning that it strongly reflects current conditions. In some cases it may be necessary to make adjustments for one-off effects that are unlikely to be repeated. The main examples of this are regulatory exercises focused on marking previously unmarked NPEs or forborne loans, which may concentrate such events within one year when their transition in states would otherwise have been more spread out.

In such cases the challenger model can be recalibrated if there is quantitative evidence to support this. Such adjustments are likely to be a key issue for discussion during QA.

7.6   Application of findings

Once the bank team's challenger model and the bank's calibration have been compared, the bank team needs to assess whether the bank should be required to increase its provisions.

- If the bank's aggregate provisions at portfolio level are higher than the bank team's estimate, there is no issue with provisioning levels.

- If the bank team's estimate is higher than the bank's, but by less than 5% at portfolio level, there is no need to investigate further and the bank's aggregate provisions should be accepted.

- If the bank team's estimate is higher than the bank's by 5-10% the deviation may still be considered immaterial if there are good reasons relating to the data or methodology, agreed upon by the bank team and the CPMO, that explain the difference without the need for further investigation. Otherwise, the difference feeds into the overall AQR adjustment to provisions calculated in workblock 9.

Where the challenger model provisions exceed the bank's provisions by more than 10%, this should be investigated by comparing the challenger model with the details of the bank's model and data. If the difference can be attributed to data, methodology or calibration issues affecting the challenger model results, this may be considered as mitigation if the bank team and the CPMO agree this is appropriate based on plausible well-evidenced reasons. Otherwise, the difference feeds into the overall AQR adjustment to provisions calculated in workblock 9.

In the investigation, the key elements of accounting requirements highlighted in Section 7.4 should be revisited using the challenger model as a quantitative guide to the implications of the requirements. For example, the challenger model provides a

benchmark of how high a point-in-time PD should be expected to be for the bank's portfolio. If the difference is attributed to a different calibration period (rather than an error in the calculation of the bank's models), this may be considered as mitigation if there are plausible well-evidenced reasons to believe that the year analysed is not representative of a point-in-time calibration, meaning that all or part of the deviation can be explained by the use of a wider calibration window. However, the bank would need to provide the historical data to justify this along with plausible explanations for why the year analysed is not representative (after adjusting for one-off effects such as those described above).

If the investigation detailed above reveals that the bank's collective provisioning model is not compliant with accounting rules and/or supervisory requirements in the context of the AQR, the challenger model should be used to determine an adjustment for collective provisions for use in the AQR-adjusted CET1% and the stress test.

7.7 Outputs

The objectives of the collective provision analysis are fourfold:

- to identify cases where the bank's collective provisioning approach is not compliant with accounting rules and/or prudential requirements;

- where the collective provisioning approach is not compliant with accounting rules and/or prudential requirements, to provide a quantitative means of assessing the impact of correcting the model/calibration for use in the CA;

- to produce parameters that can be used to "join up" the AQR and stress test outcomes;

- to identify the need for mitigating actions by banks with respect to collective provisioning models or policies.

The following outputs need to be produced for this workblock:

Table 99

Outputs for collective provision analysis

Workblock	Output
7. Collective provision analysis	T7B collective provisioning results template O7B PowerPoint presentation describing any remedial action the bank should take as a result of collective provision analysis

8 Fair value exposures review

This section provides the bank team with detailed instructions for the fair value exposures review component of Phase 2. The key aim of the review is to ensure that the bank can appropriately evaluate positions measured at fair value through profit and loss (FVTPL) and fair value through other comprehensive income (FVTOCI). It focuses on those areas where misstatement of positions is most likely, and where such an event may have a material impact on the bank's overall CET1% ratio. The review therefore focuses on assets classified as level 3 and on specific segments of assets classified as level 2 within the IFRS 13 fair value hierarchy[47], where fair value is determined on the basis of unobservable input parameters or input parameters other than quoted prices included within level 1.

8.1 Summary of approach

The fair value exposures review focuses on assets classified as level 2 or 3 within the IFRS 13 fair value hierarchy across both the banking book and the trading book, and is applied to those banks for which the review is most likely to have a material impact due to any of the following reasons:

- the bank has significant level 2/3 securities or loan portfolios;

- the level 2/3 derivatives exposure is material;

- the size of the trading book as a whole is material.

The review itself consists of four elements, each focusing on different categories of level 2/3 exposures:

1. **Revaluation of non-derivative assets:** This element provides an independent external revaluation of material level 2/3 non-derivative assets. Any discrepancies between the bank's original valuation and an independent external valuation are assessed – if the independent external valuation is lower, the difference is deducted from available capital. Valuations of certain asset classes are also benchmarked across banks to provide a further triangulation point. Positive deviations may offset negative deviations within a portfolio.

2. **Trading book core processes review:** This element provides a qualitative assessment of the efficacy and appropriateness of the processes used to estimate fair value for all trading book positions. Remedial actions are mandated to address any issues identified.

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[47] nGAAP banks should identify those positions for which valuation relies on unobservable parameters.

3. **Derivative pricing models review:** This element provides an assessment of the robustness of the most material pricing models used to value level 2/3 derivatives[48]. A reserve is quantified (where possible) and deducted from available capital to address any issues identified, in addition to possible remedial actions.

4. **Booking review:** This element provides an assessment of bookings of uncollateralised level 2/3 exposures to ensure that the features included in their termsheets are reflected appropriately and that model inputs are correct. A reserve is quantified (where possible) and deducted from available capital to address any issues identified, in addition to possible remedial actions.

One or more of the elements above may not be relevant for a given bank. For example, a bank with a large trading book may have no or very few level 2/3 derivatives or securities. Alternatively, a bank may have material level 2/3 assets but an extremely low ratio of level 2/3 assets to RWAs. As such, each element is applied to each relevant bank on a case-by-case basis. In the same vein, the booking review may also cover collateralised positions that are subject to non-standard collateralisation agreements (non-daily, non-bilateral). A sub-set of banks is required to take part for each of the three elements, as described below:

1. **Revaluation of non-derivative assets:** All banks with material non-derivative level 2/3 assets (as determined during Phase 1).

2. **Trading book core processes review:** All banks with material trading books[49], selected as in scope for the trading book review.

3. **Derivative pricing models review:** Only banks selected as in scope for the trading book review that also have material level 2/3 derivative exposure (both on a stand-alone basis and as a percentage of total bank RWAs) will participate in the derivative pricing models review (based on the trading book pricing model selection during Phase 1).

4. **Booking review:** All banks selected as in scope for the revaluation of non-derivative assets and/or the derivative pricing models review.

The next four sections provide further details for each of the four elements.

8.2   Element 1: revaluation of non-derivative assets

The following subsections describe the approach for revaluing non-derivative level 2/3 assets. This component should be carried out by the bank team, assisted where

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[48]   Both assets and liabilities are included here, as an undervalued trading book liability is equivalent to an overvalued trading book asset. This is in line with Article 105 of the CRR, with all trading book positions in scope.

[49]   Defined as having a total trading book greater than €10 billion at the AQR reference date.

appropriate by third parties with expertise in evaluating prices for level 2/3 non-derivative assets, including the ability to determine the most suitable valuation for a level 2/3 non-derivative asset when two divergent prices are available based on divergent assumptions and/or techniques. Different parties may carry out valuations across different asset classes depending on expertise. The CPMO may also decide to carry out revaluations centrally – if so, this will be communicated to the bank team at the start of the AQR.

8.2.1 Summary of approach

The bank team revalues the bank's material level 2/3 non-derivative assets. The assets in scope for revaluation are as follows:

- fair-valued loan portfolios;

- level 2/3 single-name bonds;

- level 2/3 securitisations;

- held real estate;

- participations and individual private equity investments.

Each asset class is assessed for materiality, and if an asset class is deemed to be material (based on the output of Phase I) a sample of assets is selected from that class and revalued by the bank team. The portfolio selection may also lead to other credit-related exposures being included in the review (e.g. distressed products, structured repos, credit-linked notes) where they are found to be material.

The revaluation is complemented by an assessment of the additional valuation adjustment (AVA) and fair value categorisation of the sampled assets. The sampling focuses on capturing the most material exposures in each class across the trading book and banking book in combination – there are not separate samples for the banking book and the trading book.

An additional benchmarking exercise is also carried out for level 2/3 single-name bonds and level 2/3 securitisations as part of the cross-country consistency checks carried out during CPMO QA. For this benchmarking exercise, banks are required to provide data on their level 2/3 bond and securitisation portfolios at issuer/tranche level (e.g. ISIN where available, notional, mark to market (MTM), coupon, maturity, etc.).

Following sampling and benchmarking, an independent external revaluation of each of the sampled assets is compared against the bank's original valuation, taking both the methodology used and the value itself into account. If the new valuation is lower than the original, the bank team outlines why the new valuation is appropriate, using the bank's original methodology as a reference. If no flaws are found in the new valuation, the bank must either adjust the carrying amount in its accounts or increase the reserve against the asset following the CA. In doing so, the bank is expected to

adjust for movements in the market and holdings of the asset since the review was carried out. The aggregate adjustment across all in-scope assets is calculated for each asset class and entered into the AQR-adjusted CET1% calculation as described in Section 9.5 of this document.

The revaluation should include all the elements in the table below.

Table 100

Fair value adjustments

Adjustment	Description	In IFRS 13?
Close-out/bid-offer	Adjustment to account for difference between mid-market and relevant bid/offer price	Yes
Model risk	Adjustment needed due to known limitations in a model or its usage – derived from comparison with other models	Yes
Parameter uncertainty	Uncertainty adjustments when some parameters are not observable in the market	Yes
Liquidity valuation adjustment	Adjustments needed due to uncertainty over the ability to transact at observed market levels	Yes
Future funding and investing cost	Adjustments made where it is appropriate to value the long-term funding implications of a transaction	Yes

The remainder of this section provides details on the following aspects:

1.   indicative timeline;

2.   detailed approach;

3.   outputs.

These are discussed in turn below.

8.2.2   Indicative timeline

Table 101

Indicative timeline for the revaluation of non-derivative assets

Task	Indicative date
Commence review	Week 6
Finalise positions to be revalued	Week 9
Submit benchmarking data	Week 11
Finalise revaluation results	Week 21
Finalise comparison of pricing methodologies	Week 21
Complete review	Week 21

8.2.3   Illustrative models, parameter sheets and templates

The following illustrative models, parameter sheets and templates are relevant to this workblock:

Table 102

Illustrative models, parameter sheets and templates for the revaluation of non-derivative assets

Template	Summary of contents	Frequency of submission to CPMO
T8A. Revaluation of non-derivative assets findings template	• Template to present results of revaluation of non-derivative assets • Results from template are used in the AQR-adjusted CET1% ratio template	Submission of benchmarking, and finally once complete

8.2.4 Detailed approach

The following sections provide further detail on the approach for revaluing different types of level 2/3 assets:

• level 2/3 single-name bonds;

• fair-valued loan portfolios;

• level 2/3 securitisations;

• held real estate;

• participations and individual private equity investments.

They also describe the assessment of the bank's AVA methodology and fair value categorisation to be carried out by the bank team in addition to the revaluation of each of the asset types mentioned above.

Approach for revaluing level 2/3 single-name bonds

The review treatment in this section applies to single-name bonds which are accounted for at fair value and classified as level 2/3 in the IFRS fair value hierarchy. The decision as to whether level 2/3 bonds are in scope for a given institution is made in Phase 1. Where a portfolio of level 2/3 bonds is selected in Phase 1, the bank team should select the 20 most material level 2/3 bonds (measured as MTM x duration x spread) for revaluation. Where this sample would not cover a minimum of 25% of the portfolio fair value, the bank team should instead propose a statistical sampling approach in line with ISA 530 and confirm it with the CPMO. Where the sample of the 20 most material positions exceeds 25% of the portfolio fair value and revaluation results in aggregate adjustments exceeding 5% of the portfolio fair value, the bank team should, in a second step, propose a statistical sampling approach in line with ISA 530 for the remainder of the population and confirm it with the CPMO.

The bonds are revalued individually. The exact revaluation methodology is decided by the bank team, but all fair valuations must be consistent with the principles described in IFRS 13. This should include the following:

- parameters used in the calculation should be market-consistent, including yield assumptions;

- valuation parameters should reflect the specific characteristics of the bond, including coupon, currency, step-ups, call options, embedded derivatives[50], counterparty credit rating, subordination, security, etc.

Details of the methodology used by the valuer must be delivered to the JST/NCA and the CPMO before the valuation is completed, and the JST/NCA and the CPMO must satisfy themselves that the approach is consistent with IFRS 13.

If the valuer's fair valuation is lower than the bank's original booked value (net of any reserves), the bank team should understand the reasons for the difference. Where no valid reason can be found to support the bank's valuation over that of the bank team, the fair value of the portfolio is adjusted to match the bank team value or an appropriate reserve taken following the CA (taking account of market movements and changes in the bank's holdings). The adjustment to fair value/fair value reserves is also entered into the AQR-adjusted CET1% calculation (see Section 9.5. Where a statistical sampling approach is used to select positions for revaluation, the bank team should propose an approach for projecting adjustments to the unsampled part of the portfolio in line with ISA 530.

As stated above, the valuation methodology for the bond portfolio may be chosen based on case-specific circumstances. A range of approaches are possible. We would expect a simple relative value approach to be applied in most instances, whereby contractual cash flows are projected and discounted based on market spreads and the appropriate risk-free rate. Market spreads are defined for unlisted companies based on comparable analysis, with appropriate adjustments (e.g. liquidity) to account for idiosyncratic differences between the reference name and the benchmark. This would typically be based on an external rating, or on a comparison of the counterparty's financial position where no external rating is available.

The approach is demonstrated in the below example with the following characteristics:

- The bond relates to a utility company.

- The bond is a ten-year fixed-rate bond with a coupon of 5 and a notional of 100. Annual coupon paid at the end of the year.

- The utility company is not rated and there is no market CDS, although the company is benchmarked to be equivalent to a BBB utility and market benchmarks indicate that an option-adjusted spread of 250 bps would be appropriate.

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[50] Embedded derivatives refers here to any derivatives relating to the cash flows of the bond itself (e.g. callable, putable, convertible, etc.). The treatment of fair-valued structured notes and any own issue debt with complex embedded derivatives with an underlying unrelated to the debt instrument itself is included in the derivative pricing models review.

- Euro-denominated.

Table 103

Example: Relative Value Approach

	0	1	2	3	4	5	6	7	8	9	10	Total
Contractual cashflow		5	5	5	5	5	5	5	5	5	105	150
Risk-free rate		1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	
Spread		3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	
Discount rate	100%	95%	90%	85%	81%	77%	73%	69%	66%	62%	59%	
Discounted cashflows		4.7	4.5	4.3	4.0	3.8	3.6	3.5	3.3	3.1	62.0	97

Note: Cashflows are fixed and the risk-free rate is constant, since this is a bond with fixed coupon. Clearly this would not be the case if the security was amortising, callable, floating-rate, etc.

For bonds with embedded optionality that is not already captured in the spread, it is important that this optionality is reflected appropriately in the valuation using stochastic calculus, simulation or simplified approaches. The specific approach to be used depends on the context.

When valuing a bond, the bank team must also consider whether there are any hedging derivatives. If this is the case, the hedging derivatives should also be revalued to ensure that the bond and the hedge are dealt with consistently.

A benchmarking exercise is also carried out for level 2/3 single-name bonds as part of the cross-country consistency checks carried out during CPMO QA. For this benchmarking exercise, banks are required to provide data on their bond portfolios at issuer/tranche level (e.g. ISIN where available, notional, MTM, coupon, maturity, etc.). These data are analysed by the CPMO and outliers highlighted to the bank team for consideration. To permit benchmarking, a template will be released to capture bond data and valuation assumptions.

For banks with bonds that are in scope for Phase 2, the spread assumptions applied by the bank team and the approach to dealing with embedded optionality are submitted to the CPMO during the valuation process. Where relevant, the CPMO provides feedback on the assumptions applied, including benchmarking vs assumptions used by other banks and available market parameters, and may ask for parameters to be adjusted where there is evidence that the assumptions are inconsistent with current market values.

Approach for revaluing fair-valued loan portfolios

The review treatment in this section applies only to loans which are accounted for at fair value (fair-valued loans). This does not include purchased loans which are initially booked at fair market value but are subsequently classified and accounted for under amortised cost.

Fair-valued loan portfolios are in scope for review if an incorrect valuation could pose a material risk to the bank's solvency as determined by Phase 1. If the bank has material fair-valued loan portfolios, all of these portfolios are independently valued by

the bank team. The expectation is for revaluation to be carried out at the level of portfolios rather than individual loans. However, the bank team is free to treat each component of the loan portfolio on an individual basis in a manner consistent with the approach described for bond portfolios above. The exact revaluation methodology is decided by the bank team, but the following general principles must be followed:

- All fair valuations must be consistent with the principles described in IFRS 13, in other words they should be market-consistent rather than based on (amortised) cost concepts.

- PD and LGD assumptions used in the valuation should be consistent with the current observed behaviour of the portfolio.

- PD and LGD projections used in the valuation should be aligned with the base case scenario provided by the ECB.

- The valuation should take account of prepayment behaviour and potential for refinancing at the maturity date.

- Discount rates should reflect market yields for similar asset classes, **not** the EIR or the bank's weighted average cost of capital.

- Any collateral valuation that is required to value the portfolio must be consistent with the relevant section of this document (see Section 5).

- Credit file review of the sort envisaged more widely for the AQR **is not explicitly required** for loan portfolio valuation. Internal ratings or other means of segmenting PD and LGD assumptions may be applied instead. However, this would typically involve re-underwriting exposures to a limited degree to ensure that segmentation data can be applied directly without adjustment. Depending on the context, this would be left to the discretion of the third-party valuer.

- The analysis may require a longer historical time series than requested in the AQR loan tape – these data need to be obtained bilaterally from the bank. This longer time series would only be required in the context of fair valuation of loan portfolios.

The example below shows a simple approach for dealing with a homogeneous mortgage portfolio:

- portfolio of good-quality retail mortgages (LTV of 50-70%, 2009 vintage, 20-year remaining maturity, all performing, no forborne);

- current prepayment rate of 5%;

- current default rate of 1%, projected expected recovery rate of 90% (example is simplified by assuming defaulted loans all roll to foreclosure rather than returning to performing book);

- assumed servicing costs of 20 bps;

- priced at EURIBOR +150 bps – lifetime tracker;

- assumed discount rate of EURIBOR forward curve + 150 bps (funding cost) and 40 bps (cost of capital);

- stable macroeconomic outlook;

For ease of communication in this document, the example has also been simplified by assuming that interest is paid annually at the end of each period and that all defaults result in recovery of cashflows after 24 months. Interest paid on defaulted assets is captured in the recovery rate.

In the example, the mortgage pool would be valued at 95% of nominal.

Table 104

Illustrative mortgage pool valuation

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Total
EURIBOR		0.5%	0.8%	1.1%	1.4%	1.7%	2.0%	2.3%	2.6%	2.9%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	3.2%	
Interest rate on mortgages		2.0%	2.3%	2.6%	2.9%	3.2%	3.5%	3.8%	4.1%	4.4%	4.7%	4.7%	4.7%	4.7%	4.7%	4.7%	4.7%	4.7%	4.7%	4.7%	4.7%	4.7%	4.7%	
Contractual balance	1	1.0	0.9	0.9	0.8	0.8	0.8	0.7	0.7	0.6	0.6	0.5	0.5	0.4	0.4	0.3	0.3	0.2	0.1	0.1	0.0			
Prepayment rate		5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%			
Performing outstanding bal	1	0.9	0.8	0.7	0.7	0.6	0.5	0.5	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0			
Default rate		1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%				
Cumulative default rate		1%	2%	3%	3%	4%	5%	5%	6%	6%	6%	7%	7%	7%	8%	8%	8%	8%	8%	8%				
Recovery rate		90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%				
Cashflows from servicing costs		(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)			
Casflows from default cases			0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Cashflows from amortisation		0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02			
Cashflows from prepayment		0.05	0.05	0.04	0.04	0.03	0.03	0.03	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00			
Cashflows from interest		0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00			
Total cashflows		0.11	0.10	0.10	0.10	0.09	0.08	0.08	0.07	0.07	0.06	0.06	0.05	0.05	0.04	0.04	0.04	0.03	0.03	0.03	0.02	0.00	0.00	
Discount rate		2.4%	2.7%	3.0%	3.3%	3.6%	3.9%	4.2%	4.5%	4.8%	5.1%	5.1%	5.1%	5.1%	5.1%	5.1%	5.1%	5.1%	5.1%	5.1%	5.1%	5.1%	5.1%	
Discount multiple	1	0.98	0.95	0.92	0.89	0.86	0.83	0.80	0.76	0.73	0.69	0.66	0.63	0.60	0.57	0.54	0.51	0.49	0.46	0.44	0.42	0.40	0.38	
Discounted cashflows		0.10	0.09	0.09	0.09	0.08	0.07	0.06	0.06	0.05	0.04	0.04	0.03	0.03	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.00	0.00	0.95

Details of the methodology used by any valuer must be delivered to the JST/NCA before the valuation is completed, and the JST/NCA must satisfy itself that the approach is consistent with IFRS 13. Methodology documents must be provided to the CPMO on request.

For banks with loan portfolios that are in scope for Phase 2, the yield assumptions they apply are submitted to the CPMO during the valuation process. Where relevant, the CPMO provides feedback on the assumptions applied, including benchmarking vs assumptions used by other banks and available market parameters, and may ask for parameters to be adjusted where there is evidence that the assumptions are inconsistent with current market values.

If the valuer's fair valuation is lower than the bank's original booked value (net of any reserves), the bank team should use the details of the new valuation approach to establish the differences in the methodology between the bank and the bank team. Where no valid reason can be found to support the bank's valuation over that of the bank team, the carrying value of the portfolio is adjusted to match the bank team value and used as an input to the AQR-adjusted CET1% calculation as discussed in Section 9.5.

For loan portfolios that are held at fair value due to the existence of cash flow hedges, the associated derivatives should also be included in the valuation to ensure that assumptions relating to interest rate curves are consistent.

Approach for revaluing securitisations

The review treatment in this section applies to securitisation notes which are accounted for at fair value and classified as level 2/3 in the IFRS fair value hierarchy. The decision as to whether level 2/3 securitisations are in scope for a given institution is made in Phase 1. Where selected in Phase 1, the most material level 2/3 securitisations rated as **BB- or above** are selected such that at least 50% of the carrying amount and the top 20 bonds by risk (defined as MTM x duration[51] x spread) are included. Where revaluation of this sample results in aggregate adjustments exceeding 5% of the portfolio fair value, the bank team should, in a second step, propose a statistical sampling approach in line with ISA 530 for the remainder of the population and confirm it with the CPMO.

This sample of securitisation notes is revalued by the bank team. The rating restriction does not apply to notes for which the capital requirement is calculated under the supervisory formula approach. The revaluation is calculated at the level of individual notes. The exact revaluation methodology is decided by the bank team, but all fair valuations must be consistent with the principles described in IFRS 13. This should include the following:

- All parameters should be market-consistent where feasible. For example, when valuing a collateralised debt obligation (CDO) the risk parameters (constant default rate (CDR), constant prepayment rate (CPR), severity, correlation) for the underlying notes should wherever possible be derived from market-observed parameters rather than from the historical behaviour of the underlying reference pools.

- The valuation should reflect specific features of the security, including embedded derivatives[52], cash flow triggers, reserve accounts, etc.

- Where a range of approaches are possible and no "right" model exists, an appropriately prudent approach should be taken – e.g. a net asset value-based approach is only acceptable over a cash flow-based approach if it is more conservative.

The use of market-standard tools such as INTEX and TREPP is acceptable for applicable positions[53], depending on the ability of such tools to capture deal-specific

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[51] Duration is floored at one year.

[52] Embedded derivatives refers here to any derivatives relating to the cash flows of the note or reference assets. The treatment of fair-valued structured notes and any own issue debt with complex embedded derivatives with an underlying unrelated to the instrument itself is included in the derivative pricing models review.

features, etc. This should be confirmed by the member of the bank team with the relevant experience.

Details of the methodology used must be delivered to the NCA and the CPMO before the valuation is completed, and the NCA and the CPMO must satisfy themselves that the approach is consistent with IFRS 13.

If the valuer's fair valuation is lower than the bank's original booked value (net of any reserves), the bank team should use the details of the new valuation approach to establish the differences in the methodology between the bank and the bank team. Where no valid reason can be found to support the bank's valuation over that of the bank team, the carrying value of the portfolio is adjusted to match the bank team value and the corresponding capital impact calculated in line with Section 9.5. Where a statistical sampling approach is used to select positions for revaluation, the bank team should propose an approach for projecting adjustments to the unsampled part of the portfolio in line with ISA 530.

An additional benchmarking exercise is also carried out for level 2/3 securitisations as part of the cross-country consistency checks carried out during CPMO QA. For this benchmarking exercise, banks are required to provide data on their securitisations portfolios at issuer/tranche level (e.g. ISIN where available, notional, MTM, coupon, maturity, etc.). These data are analysed by the CPMO and outliers highlighted to bank teams for consideration.

Approach for revaluing held real estate

The review treatment in this section applies to real estate assets which are held in the banking book either through investment or foreclosure and accounted for at fair value (held real estate). This does not include the bank's own property (headquarters, branches, etc.).

The decision as to whether held real estate is in scope for a given institution is made in Phase 1. Where selected in Phase 1, a sample of the bank's held real estate is reappraised by an appraiser appointed by the bank team. The sample should include the following:

The **top 10** assets (by carrying amount) in each of the following four property classes (where they exist):

- residential property;

- commercial, income-producing;

- commercial, in development;

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[53] Market-standard tools should only be used for those positions where the tool has been validated; this approach would not be suitable if the standard tool is unable to capture all features of exotic structures in line with market practice (e.g. revolving pools or exotic liability cash flow triggers).

- land.

Where the top 10 assets by carrying amount in a given property class would not cover a minimum of 25% of the aggregate carrying amount of that property class, the bank team should instead propose a statistical sampling approach in line with ISA 530 and confirm it with the CPMO. Where the sample of the ten most material positions exceeds 25% of the carrying amount of the property class and revaluation results in aggregate adjustments exceeding 5% of the aggregate carrying amount, the bank team should propose a statistical sampling approach in line with ISA 530 for the remainder of the population in the property class and confirm it with the CPMO.

The bank team should choose a representative sample of properties not included in the above and selected on the basis of an approach in line with ISA 530.

Properties which have already been appraised within the last 12 months by an appraiser using a market value approach (consistent with the approach described in the relevant section of this document) may be indexed to the current date rather than being revalued. The entity-level coordinator is responsible for verifying whether this is the case before any need for reappraisal is dismissed.

The market values of foreclosed real estate should be provisioned below market value to reflect administration costs, sales costs and expected haircuts on sale vs market value. These assumptions should be informed by the bank's own data or by system-wide data on foreclosed property sales. Assumptions should be adjusted for right-censoring, in other words the fact that properties which have been sold tend on average to be easier to sell and therefore have lower haircuts vs market values.

Where a statistical sampling approach is used to select positions for revaluation, the bank team should propose an approach for projecting adjustments to the unsampled part of the portfolio in line with ISA 530.

Approach for revaluing participations/individual private equity investments

The review treatment in this section applies to participations and individually named private equity assets (participations/IPE). This includes collective/fund investments where the underlying investee is a single company (as opposed to a group of different, unrelated companies).

The decision as to whether participations/IPE are in scope for a given institution is made in Phase 1. Where a portfolio of participations/IPE is selected as in scope, the bank team should select the top 20 (by carrying amount) for revaluation. Where this sample would not cover a minimum of 25% of the aggregate carrying amount of the portfolio, the bank team should instead propose a statistical sampling approach in line with ISA 530 and confirm it with the CPMO. Where the sample of the 20 most material positions exceeds 25% of the portfolio fair value and revaluation results in aggregate adjustments exceeding 5% of the portfolio carrying amount, the bank

team should propose a statistical sampling approach in line with ISA 530 for the remainder of the population and confirm it with the CPMO.

The exact revaluation methodology is decided by the bank team, but the following general principles must be followed:

The equity method may be used in cases where the bank's stake in the investee company is between 20% and 50%[54] and the entity-level coordinator can verify evidence that the bank has *significant influence.* Significant influence is defined as at least one or more of the influence factors listed under IAS 28(2011[55]);

- representation on the board of directors or equivalent governing body of the investee;

- participation in policy-making processes;

- material transactions between the investor and the investee;

- interchange of managerial personnel;

- provision of essential technical information.

For assets valued under the equity method, the bank team should assess whether there are indications of impairment. If there are, it should perform an impairment test in line with IAS 36. For assets not valued under the equity method, a fair value approach should be applied that must be consistent with the principles described in IFRS 13.

Whenever valuation of participation depends on collateral value, valuation should be consistent with Section 5;

Assets should typically be valued using a comparables-based approach.

Where a DCF-based approach is used instead, the parameters used in the DCF should be market-consistent. In particular, growth rates, discount rates and terminal value assumptions should be consistent with similar asset valuations (with liquidity adjustments where parameters derived from listed equities are used for the valuation of private equity investments). The valuation should be benchmarked on a multiples basis to ensure that the DCF calculation is not overly optimistic.

Revaluations **must not** be based on cost-based approaches unless the investment was made in the last six months.

If the valuer's fair valuation is lower than the bank's original booked value (net of any reserves), the JST/NCA and the CPMO should understand the reasons for the difference. Where no valid reason can be found to support the bank's valuation over that of the bank team, the carrying value of the portfolio is adjusted to match the

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[54] Under IAS 28 it is possible to be judged to have significant influence outside of this range of ownership.
[55] IAS 28 paragraphs 5-9.

bank team value or an appropriate reserve taken. The valuation adjustment should be entered into the AQR-adjusted CET1% template as described later in this document.

Where a statistical sampling approach is used to select positions for revaluation, the bank team should propose an approach for projecting adjustments to the unsampled part of the portfolio in line with ISA 530.

Approach for assessing AVA

The CRR includes requirements for prudent valuation that are applicable to all fair-valued positions, specifying that "Institutions shall formally consider the following valuation adjustments: unearned credit spreads, close-out costs, operational risks, market price uncertainty, early termination, investing and funding costs, future administrative costs and, where relevant, model risk" (Article 105(10) of the CRR). The EBA RTS on prudent valuation further specify the permissible approaches for calculating AVAs for these categories. The bank's implementation of the AVA methodology described in the EBA RTS is reviewed for all non-derivative assets selected for revaluation.

The steps to be carried out by the bank team in its assessment are summarised in **Figure 11** and described in more detail below.

Figure 11

Steps for the review of the bank's implementation of the AVA methodology
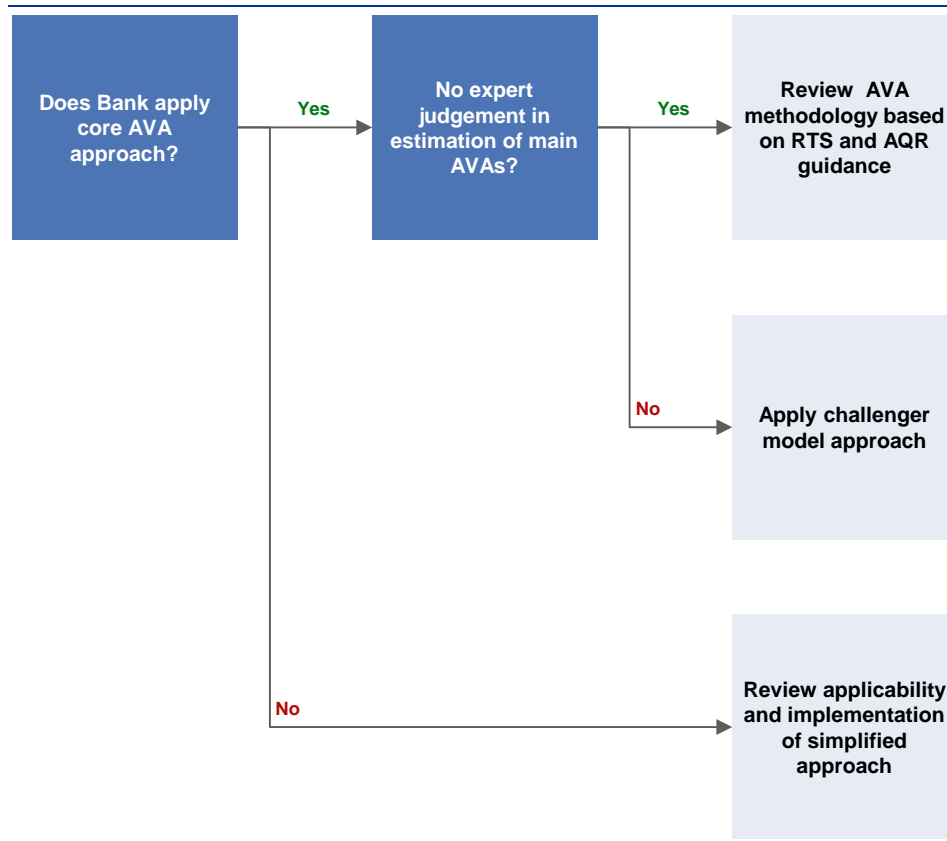
The bank team should first determine the general approach that the bank applies for calculating AVA. The EBA RTS differentiate between a core approach and a simplified approach and specify the following rules concerning the application of the simplified approach:

RTS on prudent valuation, Article 4(1)

Institutions may apply the simplified approach described in this Section only if the sum of the absolute value of fair-valued assets and liabilities, as stated in the institution's financial statements under the applicable accounting framework, is less than EUR15bn.

RTS on prudent valuation, Article 5

Institutions shall calculate AVAs under the simplified approach as 0.1% of the sum of the absolute value of fair-valued assets and liabilities which are included within the threshold calculation in Article 4.

For banks that apply the simplified approach, the bank team must verify the following:

- Is the bank allowed to apply the simplified approach according to the conditions set out in Article 4 of the RTS?

- Is the bank's aggregate AVA consistent with the rules for its calculation under the simplified approach according to Article 5 of the RTS, i.e. does it correspond to 0.1% of fair value?

For banks applying the core approach, the bank team should then determine whether the bank relies on expert judgement rather than quantitative models to determine any of the following category-level AVAs:

- market price uncertainty;

- close-out costs;

- model risk.

Where this is the case (i.e. expert judgement is used), the bank team should construct a simple challenger model to benchmark the bank's aggregate AVA on the position. The methodology of the challenger model is not identical to the AVA methodology set out in the EBA RTS, but provides a credible benchmark by quantifying a replacement cost (i.e. the cost of selling the position to a third party). The challenger model prudent value calculation should be as follows:

Fair value of position

(-) any existing reserves

(-) the cost of capital for holding the position:

$$NPV(Cost\ of\ Capital) = \sum_{n=0}^{N} \frac{(LR_n * LevExp_n * RoC_n)}{(1 + DF)^n}$$

where

LR_n: *expected required capital based on an assumed leverage ratio of 3%*

$LevExp_n$: *leverage exposure in period n*
RoC_n: *expected required return (30% to be used as fall-back)*[56]
C_n: *expected holding period*
DF_n: *discount factor (12% to be used as fall-back)*[57]

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[56] The fall-back parameter of 30% may be updated if the bank has evidence of a similar portfolio being sold at a lower return.

[57] The fall-back parameter of 12% is based on the long-term average high-yield rate and may be replaced by the bank's own discount factor using the bank's own cost of equity in line with the CAPM.

The challenger model calculation requires the bank to provide the bank team with the run-down profile for the leverage exposure (in line with the regulatory leverage ratio framework) of the position. The prudent value calculated using the challenger model is compared with the prudent value determined by the bank based on the AVA it applies to the position. If the prudent value determined by the bank exceeds the value calculated using the challenger model, the difference should be recorded as an AQR adjustment to feed into workblock 9 (AQR CET1 adjustment).

If the bank uses quantitative models rather than expert judgement to determine the AVA for market price uncertainty, close-out costs and model risk, the bank team should not apply the challenger model but should examine the calculations of all category-level AVAs for compliance with the requirements of the EBA RTS and the additional guidance provided in **Table 105**. Any findings should be reported in template T8A and, where relevant, in a supporting note.

Table 105

Guidance for AVA assessment

AVA category	Guidance for bank team assessment[58]
1. Market price uncertainty	• Trades/inputs should be categorised by maturity date, expiry date and strike (for options) • At least one executable price is required for each category, e.g. not indicative (no dealer runs or consensus pricing) • Executable price information should state the notional committed, etc. • Eligibility of price evidence should be aligned with IPV methodology (e.g. for monthly IPV, prices observed during the last five business days of the month are considered eligible)
2. Close-out costs	• A minimum of five data points should be used to calculate 90th percentile • Any use of distributions to extrapolate from a small sample needs to be conservatively fitted (based on real evidence from similar categories with richer data points)
3. Model risk	• Should be based on actual revaluations with alternative model specifications, e.g. vol. smile on and off, stochastic vol. vs local vol., etc. • Estimate of 90th percentile is expected to include a subjective scalar when number of models is low (< 10)
4. Unearned credit spreads	• No CVA-generating trades should be excluded • For proxy spread mappings a 90% measure of dispersion of the index used should be applied
5. Investing and funding costs	• Should be based on the bank's view of the worst-case funding curve, i.e. own market spread, own internal funds transfer pricing (FTP) curve, average bank spread, wholesale unsecured market funding curve, etc.
6. Concentrated positions	• Should be based on an actual comparison with market volumes and outstanding notional for bonds/equities • Basel III defines concentrated positions as any positions that require more than ten trading days to be closed • Expected to be a multiple of close-out AVA where a concentrated position is identified
7. Future admin costs	• Should apply to those portfolios that are hard-to-exit (e.g. defaulted trading loans in a work-out process)
8. Early termination	• Should include an assessment of transactions which have early termination fees waived or where such fees would not cover the bank's early termination costs
9. Operational risk	• Can be zero if the bank uses a comprehensive model for Op Risk and AVA is fully accounted for in the Op Risk calculation • Can otherwise be a function of market price uncertainty and close-out AVAs

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[58] This is to be understood as complementary guidance in addition to the EBA RTS on prudent valuation, which is the main reference document for the bank team assessment.

Approach for assessing fair value categorisation

The bank team must review the fair value categorisation of all non-derivative assets selected for revaluation at product level, primarily to determine whether assets classified as level 2 should in fact be classified as level 3 in line with the relevant criteria prescribed in IFRS 13.

IFRS 13, Para. 76

Level 1 inputs are quoted prices (unadjusted) in active markets for identical assets or liabilities that the entity can access at the measurement date.

IFRS 13, Para. 81

Level 2 inputs are inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly or indirectly.

IFRS 13, Para. 86

Level 3 inputs are unobservable inputs for the asset or liability.

Particular attention should be paid to the fact that inputs calculated based on proxies (quoted prices for similar assets) cannot automatically be considered observable.

IFRS 13, Para. 82

If the asset or liability has a specified (contractual) term, a Level 2 input must be observable for substantially the full term of the asset or liability. Level 2 inputs include the following:

1.   quoted prices for similar assets or liabilities in active markets.

2.   quoted prices for identical or similar assets or liabilities in markets that are not active.

3.   inputs other than quoted prices that are observable for the asset or liability, for example:

(a)   interest rates and yield curves observable at commonly quoted intervals;

(b)   implied volatilities; and

(c)   credit spreads.

(d)   market-corroborated inputs.

Where more than one instance of misclassification across the fair value hierarchy is identified, a wider review of the bank's methodology and outcomes may be initiated after discussion with the NCA and the CPMO.

The bank team should request day 1 P&L for those positions found to be incorrectly classified as level 2. The capital impact should be estimated by linearly adjusting day 1 P&L for the time elapsed from the inception of the misclassified position. This feeds into workblock 9 (AQR-adjusted CET1%).

Where a pricing model input is not observable in the market and the bank still classifies a position as level 2 on the grounds of materiality, the bank team should apply a flex to the parameter consistent with the 90th percentile of potential values and assess the impact on the valuation. If the impact is less than 1% of fair value, the materiality exemption may be accepted.

8.2.5   Outputs

The following outputs need to be produced for this workblock:

Table 106

Outputs for the revaluation of non-derivative assets

Workblock	Output
8. Fair value exposures review	Complete T8A. Revaluation of non-derivative assets findings template
	O8D PowerPoint presentation describing any remedial action the bank should take as a result of the revaluation of non-derivative assets

8.3 Element 2: Core processes review

The following subsections describe the core processes review, which provides a qualitative assessment of the efficacy and appropriateness of the processes used to estimate fair value for all trading book positions. This review should be carried out by a bank team with expertise in capital markets, and in particular with expertise in the processes within a bank relating to the valuation of trading book positions (and any reserves).

If a bank was not selected for the fair value exposures review, the bank team is not required to carry out a core processes review and the remainder of this section is not relevant for that bank[59]. Furthermore, any bank that is in scope for the fair value exposures review but has less than €10 billion worth of assets held for trading as of the AQR reference date is exempt.

8.3.1 Summary of approach

The core processes review involves a qualitative evaluation of the effectiveness and appropriateness of the key processes used to calculate and monitor the fair value of trading book positions (including any related fair value adjustments). The review covers eight processes (see Section 8.3.5) expected to be carried out by the bank in order to calculate and monitor the fair value of the trading book, and where sub-standard practice could lead to material misstatement of the fair value of these positions on the balance sheet. The processes are:

- pricing model validation and monitoring process;

- CVA calculation process;

- processes for calculating other fair value adjustments; (e.g. model risk, close-out costs, etc.);

- IPV process;

- P&L analysis process (P&L explain);

- new product approval process;

- collateral management process;

- operational security valuation processes.

Each process is assessed objectively across a consistent set of dimensions (see Section 8.3.5). These dimensions are:

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[59] All banks included in the trading book review are required to complete the core processes review, which includes an assessment of the pricing model validation and product approval processes.

- governance;

- calculation and methodology;

- scope and coverage;

- timeliness;

- reporting and actions;

- systems and data.

For each process, the bank team answers a prescribed set of questions as part of the detailed review, including an initial "self-assessment" carried out by the bank itself. The response to each question is Red, Amber or Green depending on the bank's sophistication compared with ECB thresholds and accounting standards (see Section 8.3.5), based on supporting evidence provided by the bank. The bank scores Green if it meets the ECB threshold, Amber if it does not meet the ECB threshold but does meet accounting standards, and Red if it meets neither the ECB threshold nor accounting standards. The outcomes of each of these detailed process reviews are compiled into a consolidated bank-level report outlining any mandatory remedial actions required together with expected timelines for remediation (see Section 8.3.7). A data request is also populated during the review and used by the CPMO to benchmark key indicators relating to the valuation processes (see Section 8.3.8). The figure below illustrates the overall review outcome.

Table 107

Core processes review illustration

The remainder of this section provides further details on the review itself and is structured as follows:

- indicative timeline;

- qualitative assessment framework dimensions;

- description of processes for review;

- objective scoring against market and accounting standards;

- remedial actions based on review findings;

- benchmarking data requirements during the core review;

- outputs.

These are described in turn below.

8.3.2 Indicative timeline

Table 108

Indicative timeline for the core processes review

Task	Indicative date
Commence reviews (with a self-assessment phase of length chosen by the NCA)	Week 6
Receive final results	Week 15

8.3.3 Illustrative models, parameter sheets and templates

The following illustrative models, parameter sheets and templates are relevant to this workblock:

Table 109

Illustrative models, parameter sheets and templates for the core processes review

Template	Summary of contents	Frequency of submission to CPMO
T8B. Core trading book processes review findings template	Template containing questionnaire for core process review Includes codified definitions for Red Amber Green assessment of each element of the review	Once complete

8.3.4 Qualitative assessment framework dimensions

A consistent set of dimensions is used across all processes to ensure the review is comprehensive. The dimensions are listed in **Table 110** below.

Table 110

Qualitative framework dimensions

Dimension	Description
A. Governance	Suitability of reporting lines, roles and responsibilities, policies, committees, team suitability, documentation
B. Calculation and methodology	Robustness of calculations and methodology Key assumptions and limitations
C. Scope and coverage	Coverage of any calculations across the portfolio
D. Timeliness	Timeliness and regularity of calculations, reviews and reports
E. Reporting and actions	Demonstrable actions when required based on transparent, relevant reporting and appropriate escalation channels
F. Systems and data	Data feeds, number of manual processes/Excel spreadsheets, systems

8.3.5 Processes

The processes covered as part of the core processes review are:

- pricing model validation and monitoring process;

- CVA calculation process;

- processes for calculating other fair value adjustments; (e.g. model risk, close-out costs, etc.);

- IPV process;

- P&L analysis process (P&L explain);

- new product approval process;

- collateral management process;

- operational security valuation processes.

These are discussed in the following sections.

Pricing model validation and monitoring process[60]

The pricing model validation[61] and monitoring process is the process by which the bank independently ensures the robustness and suitability of its valuation methodologies for each product. It is included in the review because any deficiencies in a bank's execution of this process clearly suggest that the bank may be using unsuitable models to value its trading book positions, which would lead directly to fair value misstatement. The review covers both the initial model validation and the ongoing monitoring of models. Each dimension of the qualitative review (see Section 8.4) is detailed in the table below.

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[60] Article 105 paragraph 7 of the CRR.

[61] This is a review of the bank's overall process for assessing models. Individual models are also investigated as part of the derivative pricing model review (see Section 8.4).

Table 111

Pricing model validation and monitoring process review

Dimension	Area for investigation
A. Governance	• Reporting lines and independence • Committees and challenge in the validation process • Policies and procedures • Role of Internal Audit • Documentation of current validations (including any instances of multiple models for the same product) • Documentation of model risk framework and validation approach • Resourcing of team
B. Calculation and methodology	• High-level coverage of sources of price uncertainty • Robustness of validation framework methodology (covering data quality, modelling assumptions, parameter calibration and stressing, consideration of expected model use, recommendations to hold a model reserve) • Robustness of ongoing validation framework to measure materiality and pricing uncertainty of models given change in portfolio mix and market developments, (including criteria for recommending revalidation)
C. Scope and coverage	• Initial validation coverage across products • Ongoing monitoring coverage across models and product variants • Treatment of vended models and any legacy models
D. Timeliness	• Regularity of model reviews as part of ongoing monitoring • Timeliness of extraordinary reviews (e.g. when there is a significant change to the market/portfolio) • Controls on trading prior to model validation • Time between identification of issues and revalidation/remedial actions as applicable
E. Reporting and actions	• Clarity and relevance of validation reports • Board and senior management reporting • Translation identified model weaknesses into tangible (remedial) actions
F. Systems and data	Suitability of applicable data and systems

CVA calculation process[62]

The CVA calculation process is the process by which the bank calculates its fair value adjustment to take account of the credit risk of derivative counterparties. This process is included in the review because incorrect calculation clearly leads directly to misstatement of trading book positions. Each dimension of the qualitative review is detailed in **Table 112** below. The CVA review also includes a review of the methodology, split across three sub-dimensions, namely:

1.   calculation approach;

2.   parameter estimation and calibration;

3.   parameter stressing and other modelling requirements.

For all banks in scope for the AQR (i.e. not just those banks selected for the fair value exposures review) a CVA review is carried out as part of the PP&A review (see

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[62]   IFRS 13.56, CRR Article 105 paragraph 10

Section 1.1.12). This review ascertains whether the bank performs any type of CVA calculation (as required by IFRS 13) for its derivative portfolio – any issues identified as part of the PP&A review have a quantitative impact on the AQR-adjusted CET1%. Additionally, any issues identified in the CVA component of the core processes review may also have an impact on the AQR-adjusted CET1% (to the extent that this has not already been captured in the PP&A review.

Table 112

CVA calculation process review

Dimension	Areas for investigation
A. Governance	Reporting lines
	Policies and procedures
	Documentation of calculation
B. Calculation and methodology	
i. Calculation approach	Calculation components (e.g. CVA, DVA, etc.)
	Overall calculation approach (e.g. data sources, and exposure calculation methodology)
ii. Parameter estimation and calibration	Data sources used (e.g. implied PDs from CDS when liquid CDS exists, use of proxies when no liquid CDS exists)
	Parameterisation of LGDs and justification of assumptions
	Exposure calculation methodology (e.g. simulation approach, correlations, market implied vs historical, pricing models used)
	Collateral and other risk mitigants (e.g. margin period of risk assumptions, collateral haircuts, incorporation of credit support annex (CSA) features)
iii. Parameter stressing and other modelling considerations	Wrong way risk incorporation
	Stress testing incorporation
C. Scope and coverage	Coverage of product types (e.g. treatment of exotics)
	Coverage by contract (e.g. inclusion of collateralised positions)
	Coverage of counterparties (e.g. inclusion of central counterparties (CCPs) and sovereigns)
D. Timeliness	Frequency of calculation and recalibration
E. Reporting and actions	Relevance of reporting
F. Systems and data	Mitigation strategy for data issues
	Suitability of systems/data feeds used for CVA calculation (either vended or in-house)

Process for calculating other fair value adjustments[63]

The processes for calculating other fair value adjustments (i.e. adjustments in addition to CVAs) are those processes required by the bank to calculate adjustments where the assumptions or data used to calculate fair value do not properly account for one or more of the following factors:

- model risk (including parameter uncertainty);

- illiquidity and concentration risk;

- close-out costs;

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[63]   IFRS 13, CRR Article 105 paragraphs 9-13

- operational risks;

- investing and funding costs;

- day 1 P&L;

- other operational and administrative costs.

These processes are included in the review because issues identified could lead directly to misstatement of fair value adjustments and therefore of trading book positions. Each dimension of the qualitative review (see Section 8.3.4) is detailed in the table below.

Table 113

Process for calculating other fair value adjustments review

Dimension	Areas for investigation
A. Governance	Reporting lines and independence Policies and procedures Documentation of calculations
B. Calculation and methodology	High-level coverage of fair value adjustments Robustness of calculation for each type of adjustment[1]
C. Scope and coverage	Coverage of products and positions in the portfolio Coverage of large exposures (e.g. treatment of concentrated positions) Coverage of models and unobservable parameters
D. Timeliness	Regularity of re-marking adjustments or calculation assumptions Regularity of methodology review
E. Reporting and actions	Accuracy of reporting
F. Systems and data	Accuracy/correctness of key data feeds

1) Model risk for the "riskiest" models is investigated in detail as part of the pricing model review.

IPV process[64]

The IPV process is the process by which the bank verifies prices or valuation inputs for financial reporting of fair value positions. This process is included in the review because any issues identified could lead directly to misstatement of trading book positions. Each dimension of the qualitative review (see Section 8.3.4) is detailed in the table below.

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[64] CRR Article 105 paragraph 8

Table 114

IPV process review

Dimension	Areas for investigation
A. Governance	Reporting lines and independence Policies and procedures Escalation channels
B. Calculation and methodology	Collection of independent prices and quotes and the hierarchy of sources, including use of proxies and age of marks used Cleaning, storage and mapping of independent marks to trades/models Revaluation of fair values and fair value adjustments using independent data Thresholds for escalation Process for disputing discrepancies
C. Scope and coverage	Coverage of positions in the portfolio Coverage of fair value adjustments Coverage of model inputs
D. Timeliness	Regularity of IPV process Timeliness of IPV reports Timeliness of escalation and adjustments
E. Reporting and actions	Impact of IPV findings on on-balance-sheet valuations Reporting of adjustments to P&L and reserves and suitability of aggregation levels Actions to understand IPV discrepancies Escalation of discrepancies above threshold or due to persistent mismarking
F. Systems and data	Suitability of systems/data feeds used

P&L analysis process[65]

The P&L analysis process is the process by which the bank allocates trading book P&L to the effects of underlying risk factors on individual positions or groups of similar positions. Although issues identified do not explicitly result in misstatement of trading book positions, an appropriate P&L analysis process (1) allows the bank to identify areas where mismarking may have a material impact on the fair value of the trading book, and (2) allows the bank to identify areas where the bank may require more conservative valuation or an increase in reserves (e.g. due to unanticipated cross effects in risk factor moves). P&L analysis is therefore included in the review as a key second-order indicator of the bank's ability to understand and correctly determine the fair value of trading book positions. Each dimension of the qualitative review (see Section 8.3.4) is detailed in the table below.

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[65]   Article 105 paragraph 7 (g) of the CRR.

Table 115

Table 115

P&L analysis process review

Dimension	Areas for investigation
A. Governance	Reporting lines and independence Policies and procedures Escalation channels
B. Calculation and methodology	Sensitivity vs revaluation approach Thresholds set for escalation/action based on large unexplained P&L Detail of evidence required in unexplained P&L
C. Scope and coverage	Coverage of portfolio (e.g. rationale for any excluded positions) Inclusion of trade amendments or cancellations
D. Timeliness	Timeliness of P&L explain results following daily P&L confirmation Timeliness of escalation and action following reporting
E. Reporting and actions	Transparency and actionability of reporting Evidence of escalation and action (where applicable) when thresholds are breached
F. Systems and data	Suitability of systems/data feeds used

New product approval process

The new product approval process is the process by which the bank (1) controls which types of product are approved for trading based on the bank's valuation capabilities and other considerations, and (2) controls the ongoing circumstances under which approved products are traded. This process is included in the review because any issues identified suggest that the bank's valuation capabilities and the complexity of the traded products may not be aligned. Each dimension of the qualitative review (see Section 8.3.4) is detailed in **Table 116** below.

Table 116

New product approval and permitted instrument monitoring process review

Dimension	Areas for investigation
A. Governance	Reporting lines and independence Policies and procedures Committee involvement Documentation of products and models, including the existence of a single, centrally approved product list used in downstream trading mandates
B. Calculation and methodology	Overall approval framework (e.g. valuation certainty, risk/capital calculations and limits, liquidity, reputational risk, IT capabilities, IPV, etc.) Approach to unapproved trade limits and off-system variants
C. Scope and coverage	Coverage of products and business areas
D. Timeliness	Timeliness of new product approval process – both regular and ad hoc (e.g. in the case of changes to the market environment)
E. Reporting and actions	Involvement of senior management in new product approval process Reporting of outcomes to Board and other senior management
F. Systems and data	Suitability of systems/data feeds used

Collateral management process

The collateral management process is the process by which the bank determines collateral eligibility, values, allocates and optimises collateral, conducts margin calculations, monitors collateral levels and manages collateral disputes. It is a key source of risk, and operational failures in this process can lead to financial risk and/or significant potential losses being underestimated.

Table 117

Collateral management process review

Dimension	Areas for investigation
A. Governance	• Reporting lines • Senior oversight • Collateral management policy • Collateral management process documentation (e.g. processes covered, quality of documentation) • Escalation process documentation • Management reporting • Legal documentation (e.g. availability of legal documentation in IT systems)
B. Calculation and methodology	• Methodology for determining collateral eligibility (e.g. backed by systematic categorisation, coverage of own equity) • Collateral valuation methodology (e.g. use of alternative valuation methods, definitions of deep and liquid markets, processes for dealing with collateral mismatches) • Collateralisation rates and utilisation
C. Scope and coverage	n/a
D. Timeliness	n/a
E. Reporting and actions	• Records of collateral information in internal systems (e.g. level of details stored, availability of historical data) • Availability of collateral reporting to key stakeholders • Frequency of monitoring of collateral levels • Persistent and material collateral disputes
F. Systems and data	• Dedicated systems for collateral valuation and management • Independent controls around inputs into the collateral valuation process

Operational security valuation processes

Operational security valuation processes are the processes by which the bank manages the development, validation and performance assessment of valuation models, sourcing of model inputs, trading mandates, operational risks of trading desk activities and post-trade processes. The review aims to assess the risks generated by inadequate processes (and supporting systems) that impact security valuation processes.

Table 118

Operational security valuation processes review

Dimension	Areas for investigation
A. Governance	• Reporting lines • Senior oversight • Trading mandates • Security valuation policy • Model lifecycle policy (e.g. coverage of the policy, non-remedial model enhancements, trigger-based actions) • Security valuation process documentation (e.g. quality of the policy and its parts) • Documentation for post-trade processes (e.g. coverage of the policy) • Compliance controls • Operational risk controls
B. Calculation and methodology	n/a
C. Scope and coverage	n/a
D. Timeliness	n/a
E. Reporting and actions	n/a
F. Systems and data	• Completeness of position data in IT systems • Independent data integrity controls around third-party inputs (e.g. market data) • Exceptions due to operational process failures (e.g. failures in broker confirmation checks, failure in front/back office reconciliations)

8.3.6 Objective scoring against market and accounting standards

This section describes how the bank team should carry out the review to provide an objective representation of the bank's core valuation processes (and therefore a consistent view across banks). The template provided to the bank team for the core processes review is structured on the basis of the tables in the preceding section, with one or more detailed questions per area listed. For each of these questions, the bank team scores the bank as Red, Amber or Green. Scores should be assigned using the following definitions:

- Red: Does not meet relevant accounting standards[66].

- Amber: Meets relevant accounting standards, but below ECB threshold.

- Green: Meets relevant accounting standards, and at or above ECB threshold.

The accounting standards should be identified by the bank team responsible for the review. The ECB threshold is provided for each question in the template. The ECB threshold should be objectively compared against the bank's practices and justification (with any relevant supporting evidence[67]) provided by the bank team as part of the review. There is no applicable accounting standard for certain questions, in which case the bank is scored as either Green or Amber only. For other questions

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[66] Either IFRS or nGAAP respectively depending on the accounting rules used by the bank for reporting purposes.

[67] Evidence should be available on request as required during the QA process.

the ECB threshold and the accounting standard may be aligned, in which case the bank is scored as either Green or Red only.

The remainder of this section details four worked examples of the scoring approach for an IFRS bank:

Worked example 1
CVA PD calibration

Question: How does the bank calculate PDs/credit curves for counterparties with a liquid CDS?

ECB threshold response: market-implied PD.

Example steps taken by the bank team:

1. Bank team checks applicable accounting standards and finds that the ECB threshold coincides with IFRS 13.

2. Bank team reviews CVA calculation methodology documentation and discovers that PD calibration is carried out using historical data for some cases where the bank team expects a liquid CDS would be available.

3. Bank team verifies this with supplementary analysis.

4. Bank team populates template as Red and adds rationale for this response, highlighting the sources used and appending the supporting analysis (this would then feed into the use of the CVA challenger model comparison to the extent that this issue was not identified during PP&A).

Worked example 2
IPV reporting line

Question: What is the reporting line of the IPV team?

ECB threshold response: reporting line to Finance and independent of risk takers.

Example steps taken by the bank team:

1. Bank team checks applicable accounting standards and finds no explicit reference exists in IFRS.

2. Bank team checks bank's organisational chart and discovers that the Head of IPV reports into Finance but also has a dotted line into a risk-taking group.

3.	Bank team populates template as Amber and adds rationale for this response, highlighting the source used.

Worked example 3
Calculation of fair value adjustment for illiquidity

Question: Does the bank calculate a fair value adjustment for illiquidity?

ECB threshold response: The bank should conduct regular analysis to determine whether an illiquidity adjustment is required, particularly for positions which might be susceptible to such issues (e.g. concentrated positions, one-way markets, emerging markets, etc.).

Example steps taken by the bank team:

1.	Bank team checks applicable accounting standards and finds that the accounting standard IFRS 13 is concurrent with the ECB threshold.

2.	Bank team reviews fair value adjustment policies and procedures and any other sources available (e.g. methodology documentation), *but* does not find any evidence that the bank considers illiquidity as a fair value adjustment for a particular class of products.

3.	Bank team holds discussions with the bank and allows the bank to provide any evidence. The bank subsequently provides a memo dated 2010 stating that the bank did hold an adjustment for illiquidity, but cannot provide evidence that the adjustment is regularly analysed.

4.	Bank team populates template as Red and adds rationale for this response, highlighting sources used.

Worked example 4
Validation of vended models

Question: Does the bank validate valuation models purchased from a third party?

ECB threshold response: The bank should validate and regularly assess vended models as part of its overall validation and model risk monitoring process.

Example steps taken by the bank team:

1.	Bank team checks applicable accounting standards – accounting standard IFRS 13 is concurrent with the ECB threshold.

2. Bank team reviews validation reports for all third-party models, concludes that all third-party models are validated and confirms this conclusion with the bank.

3. Bank team reviews policies and procedures and model risk framework documentation and confirms that third-party models are included in the ongoing monitoring process.

4. Bank team populates template as Green and adds rationale for this response, highlighting sources used.

8.3.7 Determining remedial actions based on review findings

This section details the approach the bank team should follow to determine any remedial actions and their respective timelines based on the results from the core processes review questionnaire. Each area investigated is scored as Red, Amber or Green based on an objective comparison with accounting standards and ECB thresholds (see Section 8.3.5). Remedial actions are mandated for the bank for all questions resulting in a Red score. The remedial action should be specified by the bank team where necessary, and should be the minimum action required for the bank to comply with accounting standards. These should be addressed so that accounting standards are complied with as soon as possible.

The bank is required to address Amber issues (i.e. misalignment with market standards) at the NCA's discretion.

Where two or more remedial actions are closely linked (e.g. they relate to the same dimension of the same process), the bank team should consolidate the two actions into a single recommendation if appropriate.

8.3.8 Data requirements during the core processes review

As with the PP&A review, each in-scope bank is required to carry out a self-assessment using the core processes review template. In doing so, the bank should provide data to evidence its answers for each of the eight processes – these requests are embedded within the questionnaire template. The bank team may use these responses as evidence when populating the template answers as Red, Amber and Green; they are also used in the QA process to ensure consistency across banks and jurisdictions. Examples of the types of data requested are:

- headcounts for the team responsible for each process in the review;

- model approvals/rejections data;

- counterparty exposure profile by maturity and counterparty rating;

- fair value adjustments by category;

- IPV exceptions report;

- P&L explain report;

- product approvals/rejections data.

8.3.9 Outputs

The following output needs to be produced for this workblock:

Table 119

Outputs for the core processes review

Workblock	Output
8. Fair value exposures review	• Complete T8B. Core trading book processes review questionnaire template • O8D PowerPoint presentation describing any remedial action the bank should take as a result of core trading book processes review

8.4 Element 3: Derivative pricing model review

The following subsections describe the derivative pricing model review, which assesses the robustness of the most material pricing models used to value level 2/3 derivatives. This review should be carried out by a bank team with expertise in pricing derivatives (particularly exotic products) and calculating suitable reserves (or other mitigating action) where there are known deficiencies, limitations or significant unobservable parameters associated with a given valuation technique. The CPMO may also decide to carry out the review centrally – if so, this will be communicated to the bank team at the start of the AQR.

If a bank has immaterial level 2/3 derivative[68] exposure as identified during Phase 1, the bank team is not required to carry out a pricing model review for the bank and the remainder of this section is not relevant for the bank.

8.4.1 Summary of approach

The derivative pricing model review focuses on pricing models used by the bank to price complex derivatives where valuation depends on inputs other than quoted prices (for those positions not covered by the revaluation review detailed in Section 8.2). A set of models for review is selected during Phase 1 as part of the portfolio/model selection. The selection identifies models that make the largest contribution to leverage exposure and AVA, and those most likely to give rise to model risk. The review assesses models across four dimensions, namely:

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[68]   Securitisations in the correlation trading portfolio should be included in the pricing model review.

- **model use:** the appropriateness of the model given the nature of the products being valued and the use of model outputs;

- **model assumptions:** the appropriateness and limitations of any modelling assumptions, techniques and product simplifications used;

- **input data:** the appropriateness and integrity of any input data used;

- **model calibration:** the appropriateness of calibrated model parameter values and the methodology used.

For each dimension, the bank team answers a set of questions as part of the detailed review. The response to each question is High, Medium or Low risk[69], and reflects the robustness of the model's valuation with respect to each question (see Section 8.4.5). The bank team also reviews the AVAs and fair value categorisation of the products covered by the respective model. Where an issue is identified (denoted by a Medium or High response), the bank team quantifies the issue (where feasible) using available means for incorporation into the AQR-adjusted CET1% calculation (see Section 8.4.7).

Additional mandatory remedial actions are also imposed as necessary. These outcomes are compiled into a model report together with expected timelines (see Section 8.4.9).

The bank team selects the models based on the outcome of Phase 1. Five to ten models are expected to be in scope for each bank, though some banks may have very few/none and the very largest and most sophisticated banks could have more than ten (where resources allow). The bank team should then complete the initial questionnaire to identify any issues, and prioritise the quantification of issues based on expected materiality according to the initial assessment. The CPMO acknowledges that there is no well-defined concept of an individual pricing model within the industry. Similarly, there is no standard definition of the point in the model modification process at which such modifications result in a "different" model.

However, the remainder of this document refers to pricing models under the assumption that the NCA, bank team and bank are able to partition the valuation techniques used by the bank into a set of distinct pricing models submitted in the Phase 1 trading book template. This should be done based on the expert judgement of the bank team and bank in line with the guidelines provided during data collection.

The remainder of this section is structured as follows:

- indicative timeline;

- assessment framework dimensions;

- objective scoring for each dimension;

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[69] Risk in this context refers to the risk of the model producing an incorrect valuation.

- quantification of adjustments;

- remedial actions based on review findings;

- outputs.

These are discussed below.

8.4.2 Indicative timeline

Table 120

Indicative timeline for the derivative pricing model review

Task	Indicative date
Commence review	Week 5
Receive triaging results	Week 11
Receive final results	Week 22

8.4.3 Illustrative models, parameter sheets and templates

The following illustrative models, parameter sheets and templates are relevant to this workblock:

Table 121

Illustrative models, parameter sheets and templates for the derivative pricing model review

Template	Summary of contents	Frequency of submission to CPMO
T8C. Derivative pricing model review findings template	- Template containing questionnaire for derivative pricing model - Includes codified definitions for High Medium Low assessment of each element of the review	Interim update provided once questionnaire is complete, then once complete

8.4.4 Assessment framework dimensions

A consistent set of areas is assessed for each pricing model across the four dimensions of the review. The areas are detailed in **Table 122** below.

Table 122

Derivative pricing model review

Dimension	Area for investigation
1. Model use	Range of products priced by model
	Hedging strategies or portfolio decisions made on the basis of model outputs
	P&L explain process and exceptions
2. Model assumptions	Number and type of model components (stochastic differential equation, static distribution, parameterisation, etc.)
	Number of stochastic variables and complexity of modelled behaviour (distribution, mean reversion, drift, jumps, etc.)
	Model solution (e.g. closed-form solution, numerical method, Monte Carlo) and any techniques (e.g. accelerated Monte Carlo methods)
3. Input data[1]	Similarity of market data to required instruments and use of proxies
	Interpolation/extrapolation
	Bid/ask, depth of market and other illiquidity considerations
	Frequency of re-marking and availability of marks
4. Model calibration	Degrees of freedom and global/local considerations
	Calibration fit and number of different possible calibrations that give a good fit
	Economic intuition of parameter values
	Sensitivity to parameters
	Frequency of recalibration

1) Includes calibration input data.

8.4.5   Objective scoring for each criterion

This section describes how the bank team should carry out the review to provide an objective representation of the robustness of valuation for each model respectively (and therefore a consistent view across models and banks). The pricing model template provided to the bank team to carry out the review is structured on the basis of the table in Section 8.4.4 above. For each question, the bank team scores the bank as High, Medium or Low. Scores should be assigned using the following definitions:

- High: Adjustment necessary and either no mitigation already exists, or mitigation does not materially address the issue.

- Medium: Adjustment necessary but mitigation already exists that materially addresses the issue.

- Low: No adjustment necessary.

Mitigation could relate to either the bank's current fair value reserves and/or any conservative marking (e.g. writing off optionality, reserving P&L gains, implicit modelling simplifications, etc.). Objective criteria are provided in the template, enabling the bank team to score each model as High, Medium or Low. The bank team should also provide justification (together with any relevant supporting evidence) within the template as part of the review. The bank team has several sources of information available to use during the review:

- self-assessment carried out by the bank to identify model weaknesses;

- interviews with model users and developers in the bank, who can direct the bank team to specific pieces of documentation or analysis to use as evidence for answers;

- model documentation and validation reports;

- any analysis (regular or ad hoc) performed by the bank regarding positions valued by the model.

Several examples are outlined below:

Worked example 1
IPV results

Question: Have any issues been identified during the IPV process over the last 12 months?

Guidance: All products should be included in the IPV process and all material discrepancies should be reserved, including those arising from consensus price service rejections or collateral margining disputes.

Example steps taken by the bank team:

1. Bank team reviews IPV results for the last 12 months for products priced by model, identifying whether the scope is appropriate, and finds that there have been several recent occurrences of marks from a consensus pricing service being rejected.

2. Bank team is not able to identify a reserve for this issue, and the bank confirms that no reserve or other mitigating action exists for this issue.

3. Bank team populates template as High and adds rationale for this response, highlighting sources used.

Worked example 2
Use of extrapolation

Question: Is suitable analysis performed to understand sensitivity to extrapolation used?

Guidance: The bank should perform regular analysis to understand the sensitivity to any extrapolation assumptions under a range of scenarios (both to input data, and within the model calculation), including the strength of evidence from market data and possible alternative techniques

Example steps taken by the bank team:

1. Bank team identifies that the bank is not currently required to perform extrapolation of observable data points given current market conditions and data availability.

2. Bank team therefore populates template as Low and adds rationale for this response, highlighting sources used.

Worked example 3

Accelerated Monte Carlo technique

Question: Has the bank performed analysis to understand the impact of the choice of solution approach, including bias and variance?

Guidance: The bank should perform regular analysis to understand the impact of the choice of solution approach, including the use of special-case analytical solutions (where applicable), and compare it with alternative approaches such as a larger number of unbiased Monte Carlo scenarios.

Example steps taken by the bank team:

1. Bank team reviews documentation for Monte Carlo pricing model and discovers that the daily model run uses a reduced simulation to lower run time.

2. A model reserve is held for the model, but the rationale is not clearly specified. Bank team asks the bank how the reserve is calculated, and the bank provides evidence explaining that the full calculation is run monthly, and on the full run date the difference between the full and reduced calculation is calculated and included as a component of the overall model reserve.

3. Bank team populates template as Medium and adds rationale for this response, highlighting sources used.

Worked Example 4

Calibration of unobservable parameters

Question: Are unobservable parameter values supported by economic rationale?

Guidance: The bank should be able to justify the choice of parameter value, and a range of possible and plausible values.

Example steps taken by the bank team:

1. Bank team reviews existing parameter values and notes that they require assumptions that are not data-driven and lack economic intuition, leading to a particular choice.

2. The bank is unable to provide evidence of any mitigating action or consideration of alternative values and the impact this would have on valuation.

3. Bank team populates template as High and adds rationale for this response, highlighting sources used.

8.4.6   Quantification of adjustments

This section describes the approaches available to the bank team for calculating quantitative adjustments for issues identified during the assessment detailed in Sections 8.4.4 and 8.4.5. However, no single consistent methodology is available to the bank team that can be used for all issues identified. At a high level, three approaches are possible:

*   have the bank perform ad hoc calculations using existing models to calculate the impact directly, e.g. re-marking of parameters or adjustments to other model settings;

*   have a third party develop a model to price the relevant exposures (or a sample of the exposures);

*   have one or more other banks offer prices on samples of exposures to determine adjustments.

All valuations should ensure that they account for the following factors:

Table 123

Fair value adjustments

Adjustment	Description	In IFRS 13?
Close-out/bid-offer	Adjustment to account for difference between mid-market and relevant bid/offer price	Yes
Model risk	Adjustment needed due to known limitations in a model or its usage – derived from comparison with other models	Yes
Parameter uncertainty	Uncertainty adjustments when some parameters are not observable in the market	Yes
Liquidity valuation adjustment	Adjustments needed due to uncertainty over the ability to transact at observed market levels	Yes
Future funding and investing cost	Adjustments made where it is appropriate to value the long-term funding implications of a transaction	Yes

Examples are listed below. The CPMO acknowledges that these are stylised examples which do not necessarily reflect the complexities that may be identified, and as such they are provided for guidance only. If an identified issue is not similar to the examples, the bank team should where possible use all available means,

including its own expert judgement and experience, to devise an approach for quantifying the issue.

Each example presented below is a simplified description of an issue that may exist with a pricing model valuation, and which may be identified during population of the derivative pricing model template. The examples contain a brief description of the issue together with one or more example approaches of how an independent and external party (the bank team) may attempt to quantify a reserve or mitigate the issue. The approaches to mitigation themselves are also stylised.

The mitigation approaches described below may already be used by the bank (for Amber issues), or may not be appropriate for a particular similar issue identified during the review, particularly given the stylised and brief nature of these examples. The bank team should apply its own expert judgement in all cases when determining a specific mitigation approach, and should use the below examples strictly in the spirit they are provided, as described in this section. Some examples describe multiple stylised mitigation approaches. In such cases the bank team should use its own expert judgement to determine whether any of the example mitigation approaches are appropriate. Where more than one approach is deemed appropriate, the bank team should choose the most suitable based on an appropriate level of prudence and ease of implementation.

Worked example 1
Product coverage

Issue: Model was originally used by the bank for a set of products, but is now also used to price similar illiquid products with additional features that the bank team believes the model assumptions may not be appropriate for (e.g. illiquid long-dated equity options which are dependent on equity/interest rate correlation).

Example mitigation 1:

- The bank revalues positions with a model which captures the features of the illiquid product.

- The difference between the new valuation and the current valuation should be reserved.

Example mitigation 2:

- The bank may look for examples when the illiquid product has traded and quantify the model pricing error.

- The bank should then apply any observed discrepancy to the current positions and reserve the resulting amount.

Worked example 2
Use of extrapolation

Issue: Model inputs require the extrapolation of observable data to illiquid maturities/strikes for which no observable data are available (e.g. long-dated interest rate swap rates or far-out-of-the-money implied volatilities).

Example mitigation 1:

- The bank looks for examples of when the longest-dated marks are available, to determine whether the extrapolation technique would have been appropriate for the observable data, and calculates any observed error.

- The observed error of the extrapolation technique across observable data applied to the current position could then be reserved.

Example mitigation 2:

- The bank team or bank determines (e.g. using any available historical data observed for long-dated trades) a set of possible extrapolation techniques which fit the observed data (assuming there is no economic reason to suspect that the observed relationships may break down).

- The bank should value applicable positions using each extrapolation technique, and reserve the difference between the chosen technique's valuation and the lowest valuation of all techniques.

Worked example 3
Accelerated Monte Carlo technique

Issue: The daily running of a Monte Carlo valuation model uses a small number of scenarios (known to demonstrate limited stability) to reduce the computational burden, with the full simulation only run periodically.

Example mitigation:

- The bank runs the full simulation to determine the error of the reduced method.

- This error is reserved.

Worked example 4
Calibration of unobservable parameters

Issue: The calibration used is one of several "good fits" selected on the basis of trader intuition and is based on liquid strikes, where the bank also trades other illiquid strikes.

Example mitigation 1:

- The bank identifies the parameters lacking intuition and stresses them to reasonable values.

- The impact on valuation is calculated and reserved.

Example mitigation 2:

- The bank determines a representative set of possible "good fit" calibrations.

- The bank's current position should be valued using each calibration, and the difference between the chosen calibration valuation and the lowest valuation of all calibrations used should be reserved.

Worked example 5
Distribution choice for stochastic variable

Issue: The pricing model assumes a distribution for one of the model inputs that the bank team believes underestimates kurtosis.

Example mitigation 1:

- The positions should be repriced using an alternative model (either bank or third-party) that allows for fatter tails (e.g. an appropriately parameterised jump diffusion or stochastic volatility model).

- The difference between the new valuation and the current valuation should be reserved.

Example mitigation 2:

- The historical distribution should be determined and the distribution parameters used in the model recalibrated using an appropriate tail percentile of the observed distribution.

- The difference between the new valuation and the current valuation should be reserved.

Worked example 6
Model choices

Issue: The model used is one of several models currently used in the market for a particular product – the bank's model is either used less frequently or considered less able to describe the observed behaviours of the applicable underlying.

Example mitigation:

- The applicable positions should be revalued using as many of the models within this suitable portfolio of models as possible, potentially by a third party.

- The difference between the chosen model valuation and the lowest valuation of all models tested should be reserved.

Worked example 7
Unobservable parameter

Issue: An unobservable parameter is required to price an exotic product.

Example mitigation 1:

- Realistic values of the unobservable parameter are determined (using any market-implied or historical data and economic intuition where possible).

- Applicable positions should be repriced for each parameter value, and the difference between the current valuation and the lowest valuation of all parameter choices should be reserved.

Example mitigation 2:

Where optionality is "long optionality only" and using a simplified more liquid product is globally conservative (e.g. Bermudan vs European), the difference between the

Example mitigation 3:

Where the unobservable parameter has no economic basis by which a plausible set of values can be determined, an alternative model which does not rely on such a parameter may be used (probably including globally conservative simplifications of the product).

The difference between the chosen model valuation and the new valuation is reserved.

Worked example 8
Model assumptions

Issue: There are one or more model assumptions (in general) identified by the bank team as simplified compared with models used widely in the market.

Example mitigation 1:

Where traded optionality can be simplified to a globally conservative liquid product (e.g. Bermudan vs European, or digital vs call spread), the difference between the model valuation and the equivalent simplified option with same underlying can be reserved.

Example mitigation 2:

The PV of the pay-offs of applicable trades may be determined for stressed values of the underlying, and the difference between the worst case and the current valuation should be reserved.

Example mitigation 4:

The bank team asks the bank to have a sample of exposures revalued by a capable third party (either the bank team or another third party).
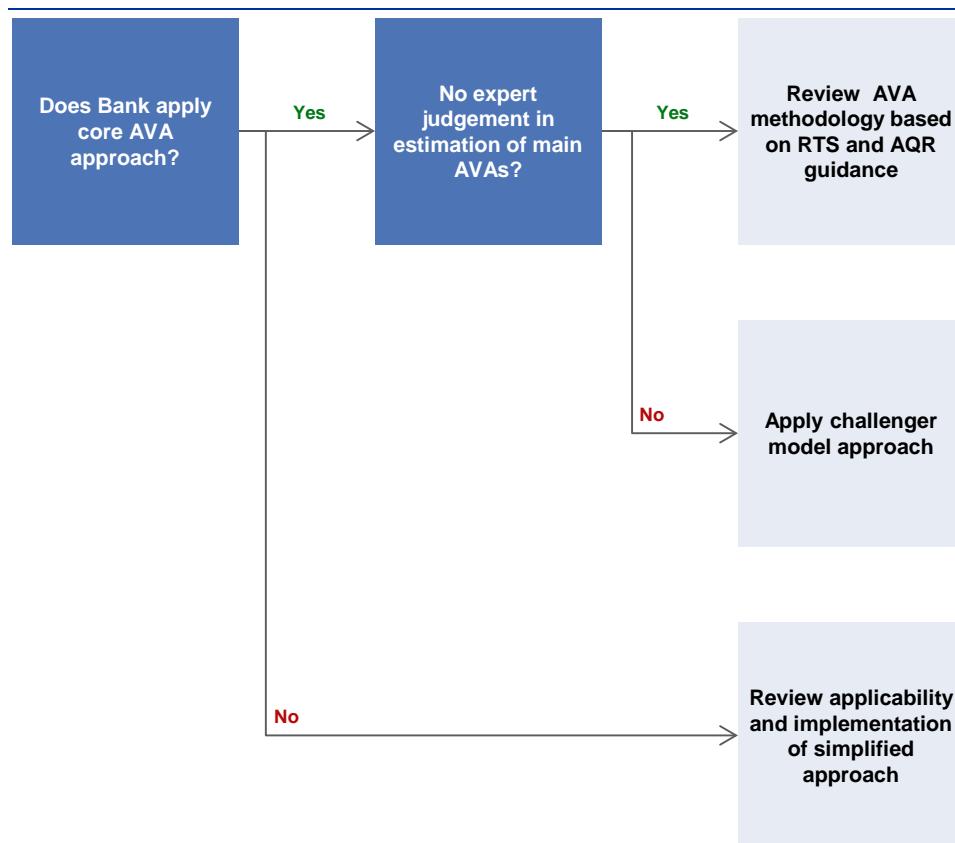
8.4.7   AVA assessment

The CRR includes requirements for prudent valuation that are applicable to all fair-valued positions, specifying that "Institutions shall formally consider the following valuation adjustments: unearned credit spreads, close-out costs, operational risks, market price uncertainty, early termination, investing and funding costs, future administrative costs and, where relevant, model risk" (Article 105(10) of the CRR). The EBA RTS on prudent valuation further specify the permissible approaches for calculating AVAs for these categories. The bank's implementation of the AVA

methodology described in the EBA RTS is reviewed for the positions covered by the pricing models selected for review.

The steps to be carried out by the bank team in its assessment are summarised in **Figure 12** and described in more detail below.

Steps for the assessment of the bank's implementation of the AVA methodology

The bank team should first determine the general approach that the bank applies for calculating AVA. The EBA RTS differentiate between a core approach and a simplified approach and specify the following rules concerning the application of the simplified approach:

RTS on prudent valuation, Article 4(1)

Institutions may apply the simplified approach described in this Section only if the sum of the absolute value of fair-valued assets and liabilities, as stated in the institution's financial statements under the applicable accounting framework, is less than EUR15bn.

For banks that apply the simplified approach, the bank team must verify the following:

- Is the bank allowed to apply the simplified approach according to the conditions set out in Article 4 of the RTS?

- Is the bank's aggregate AVA consistent with the rules for its calculation under the simplified approach according to Article 5 of the RTS, i.e. does it correspond to 0.1% of fair value?

For banks applying the core approach, the bank team should then determine whether the bank relies on expert judgement rather than quantitative models to determine any of the following category-level AVAs:

- market price uncertainty;

- close-out costs;

- model risk.

Where this is the case (i.e. expert judgement is used), the bank team should construct a simple challenger model to benchmark the bank's aggregate AVA on the position. The methodology of the challenger model is not identical to the AVA methodology set out in the EBA RTS, but provides a credible benchmark by quantifying a replacement cost (i.e. the cost of selling the position to a third party). The challenger model prudent value calculation should be as follows:

Fair value of the position

(-) any existing reserves

(-) the cost of capital for holding the position:

$$NPV(Cost\ of\ Capital) = \sum_{n=0}^{N} \frac{(LR_n * LevExp_n * RoC_n)}{(1 + DF)^n}$$

where

LR_n: *expected required capital based on an assumed leverage ratio of 3%*

$LevExp_n$: *leverage exposure in period n*
RoC_n: *expected required return (30% to be used as fall-back)*[70]

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[70]   The fall-back parameter of 30% may be updated if the bank has evidence of a similar portfolio being sold at a lower return.

C_n: *expected holding period*

DF_n: *discount factor (12% to be used as fall-back)*[71]

The challenger model calculation requires the bank to provide the bank team with the run-down profile for the leverage exposure (in line with the regulatory leverage ratio framework) of the position. The prudent value calculated using the challenger model calculation is compared with the prudent value determined by the bank based on the AVA it applies to the position. If the prudent value determined by the bank exceeds the value calculated using the challenger model, the difference should be recorded as an AQR adjustment to feed into workblock 9 (AQR CET1 adjustment).

If the bank uses quantitative models rather than expert judgement to determine the AVA for market price uncertainty, close-out costs and model risk, the bank team should not apply the challenger model but should examine the calculations of all category-level AVAs for compliance with the requirements of the EBA RTS and the additional guidance provided in **Table 124**. Any findings should be reported in template T8C and, where relevant, in a supporting note.

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[71] The fall-back parameter of 12% is based on the long-term average high-yield rate and may be replaced by the bank's own discount factor using the bank's own cost of equity in line with the CAPM.

Table 124

Guidance for AVA assessment

AVA category	Guidance for bank team assessment[1]
1. Market price uncertainty	Trades/inputs should be categorised by maturity date, expiry date and strike (for options)
	At least one executable price is required for each category, e.g. not indicative (no dealer runs or consensus pricing)
	Executable price information should state the notional committed, etc.
	Eligibility of price evidence should be aligned with IPV methodology (e.g. for monthly IPV, prices observed during the last five business days of the month are considered eligible)
2. Close-out costs	A minimum of five data points should be used to calculate 90th percentile
	Any use of distributions to extrapolate from a small sample needs to be conservatively fitted (based on real evidence from similar categories with richer data points)
3. Model risk	Should be based on actual revaluations with alternative model specifications, e.g. vol. smile on and off, stochastic vol. vs local vol., etc.
	Estimate of 90th percentile is expected to include a subjective scalar when a number of models is low (< 10)
4. Unearned credit spreads	No CVA-generating trades should be excluded
	For proxy spread mappings a 90% measure of dispersion of the index used should be applied
5. Investing and funding costs	Should be based on the bank's view of the worst-case funding curve, i.e. own market spread, own internal FTP curve, average bank spread, wholesale unsecured market funding curve, etc.
6. Concentrated positions	Should be based on an actual comparison with market volumes and outstanding notional for bonds/equities
	Basel III defines concentrated positions as any positions that require more than ten trading days to be closed
	Expected to be a multiple of close-out AVA where a concentrated position is identified
7. Future admin costs	Should apply to those portfolios that are hard-to-exit (e.g. defaulted trading loans in a work-out process)
8. Early termination	Should include an assessment of transactions which have early termination fees waived or where such fees would not cover the bank's early termination costs
9. Operational risk	Can be zero if the bank uses a comprehensive model for Op Risk and AVA is fully accounted for in the Op Risk calculation
	Can otherwise can be a function of market price uncertainty and close-out AVAs

1) This is to be understood as complementary guidance in addition to the EBA RTS on Prudent Valuation, which constitute the main reference document for the bank team assessment.

8.4.8 Assessment of fair value categorisation

The bank team must review the fair value categorisation of the products covered by the pricing models selected for review, primarily to determine whether positions classified as level 2 should in fact be classified as level 3 in line with the relevant criteria prescribed in IFRS 13.

IFRS 13, Para. 76

Level 1 inputs are quoted prices (unadjusted) in active markets for identical assets or liabilities that the entity can access at the measurement date.

IFRS 13, Para. 81

Level 2 inputs are inputs other than quoted prices included within level 1 that are observable for the asset or liability, either directly or indirectly.

IFRS 13, Para. 86

Level 3 inputs are unobservable inputs for the asset or liability.

Particular attention should be paid to the fact that inputs calculated based on proxies (quoted prices for similar assets) cannot automatically be considered observable.

IFRS 13, Para. 82

If the asset or liability has a specified (contractual) term, a Level 2 input must be observable for substantially the full term of the asset or liability. Level 2 inputs include the following:

1.   quoted prices for similar assets or liabilities in active markets.

2.   quoted prices for identical or similar assets or liabilities in markets that are not active.

3.   inputs other than quoted prices that are observable for the asset or liability, for example:

(a)   interest rates and yield curves observable at commonly quoted intervals;

(b)   implied volatilities; and

(c)   credit spreads.

(d)   market-corroborated inputs.

IFRS 13, Para. 83

Adjustments to Level 2 inputs will vary depending on factors specific to the asset or liability. Those factors include the following:

1.   the condition or location of the asset;

2.   the extent to which inputs relate to items that are comparable to the asset or liability (including those factors described in paragraph 39);

3.   the volume or level of activity in the markets within which the inputs are observed.

IFRS 13, Para. 84

An adjustment to a Level 2 input that is significant to the entire measurement might result in a fair value measurement categorised within Level 3 of the fair value hierarchy if the adjustment uses significant unobservable inputs.

In the review, the bank team should focus in particular on those level 2 positions where the highest levels of day 1 P&L were realised at inception and on positions which have been reclassified from level 3 to level 2, especially in cases where the reclassification has led to recognition of initially reserved day 1 P&L.

Where more than one instance of misclassification across the fair value hierarchy is identified, a wider review of the bank's methodology and outcomes may be initiated after discussion with the NCA and the CPMO.

The bank team should request day 1 P&L for those positions found to be incorrectly classified as level 2, in order to quantify the capital impact. Where appropriate, this can be estimated by linearly adjusting day 1 P&L for the time elapsed from the inception of the misclassified position. This feeds into workblock 9 (AQR-adjusted CET1%).

Where a pricing model input is not observable in the market and the bank still classifies a position as level 2 on the grounds of materiality, the bank team should apply a flex to the parameter consistent with the 90th percentile of potential values and assess the impact on the valuation. If the impact is less than 0.1% of notional, the materiality exemption may be accepted.

8.4.9 Determining remedial actions based on review findings

The reserve calculations should be complemented with any necessary remedial action identified by the bank team. The remedial action should be the minimum action required for the bank to mitigate any issues identified (including setting up the calculation and holding a model reserve), and any other actions required to ensure IFRS[72] and CRR[73] compliance. Where two or more remedial actions are closely linked (e.g. they relate to the same dimension of the same process), they should be consolidated into a single template if appropriate.

8.4.10 Outputs

The following outputs need to be produced for this workblock:

Table 125
Outputs for the derivative pricing model review

Workblock	Output
8. Fair value exposures review	• Complete T8C. Derivative pricing model review findings template • O8D PowerPoint presentation describing any remedial action the bank should take as a result of the derivative pricing model review

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[72] In particular, any IFRS 13 disclosures for significant level 3 inputs required under IFRS 13.92(g), (h).

[73] In particular, Article 105 paragraph 2 (a) and paragraph 13.

8.5 Element 4: Booking review

The following subsections describe the booking review, which provides an assessment of bookings of uncollateralised level 2/3 exposures to ensure that the features included in their termsheets are reflected appropriately and that model inputs are correct. This review should be carried out by a bank team with expertise in pricing exotic products and calculating suitable reserves (or other mitigating action) where there are known deficiencies, limitations or significant unobservable parameters associated with a given valuation technique.

8.5.1 Summary of approach

The first step in the booking review is to select, from all uncollateralised level 2/3 transactions, a sample of those that exhibit complex features and are thus prone to booking errors. The bank team achieves this using a combination of four approaches:

- a sample of 100 termsheets is created by identifying key terms that are indicative of complex features (e.g. contingent, bespoke, etc.) using an NLP tool;

- an additional sample of 100 termsheets of the bank's most material uncollateralised level 2/3 positions is selected;

- an additional sample of 100 termsheets of uncollateralised level 2/3 positions is drawn randomly;

- the bank is asked to identify its most material positions exhibiting each of the following five specific features prone to booking errors:

    - off-balance-sheet lending;

    - floored coupons;

    - notional linked to non-market event;

    - callable by the bank;

    - snowball.

The sampling approach described above may also be extended to cover collateralised positions that are subject to non-standard collateralisation agreements (non-daily, non-bilateral), where these are material.

The bank team then reviews each of the 305 sampled bookings to verify that the valuation model inputs are correct and can be mapped to the termsheet, and that all features of the transaction as set out in the termsheet are captured in the booking.

8.5.2   Indicative timeline

Table 126

Indicative timeline for the booking model review

Task	Indicative date
Commence review	Week 5
Bank to provide list of most material positions with five specific features	Week 7
Finalise sample of termsheets	Week 8
Receive final results	Week 18

8.5.3   Illustrative models, parameter sheets and templates

Table 127

Illustrative models, parameter sheets and templates for the booking review

Template	Summary of contents	Frequency of submission to CPMO
T8D. Booking review findings template	Template to record the sample of bookings selected for review and the findings of the review	Interim update provided once sample has been determined, then once review is complete
NLP tool	Proof of concept illustrating the NLP sampling process (Python Notebook file containing code and step-by-step comments)	Submission only upon specific CPMO request

8.5.4   Detailed approach

Termsheet sampling

The bank team first needs to gather the termsheets of all of the bank's uncollateralised level 2 and level 3 positions, from which it selects a sample of 100 termsheets by identifying key terms that are indicative of complex features (e.g. contingent, bespoke, etc.). It should do this by following the steps outlined below. The bank team can conduct its analysis using the NLP tool/proof of concept provided by the CPMO, which has been developed in Python, or create an adapted version using different software.

1.   PDF termsheets are converted into html/txt format.

2.   The html/txt files are analysed and a dictionary of stem words produced (for example, amortising, amortisation and amortise are reduced to the common stem word amort).

3.   This dictionary is reviewed manually and words considered indicative of complex features (expected to appear with low frequencies) are identified.

4. The words identified in step 3 are added to a default list of watchwords provided by the CPMO.

5. The full set of termsheets is analysed for the occurrence of watchwords, creating an intermediate sample of all those in which they occur.

6. The intermediate sample from step 5 is further reviewed manually to determine the final sample of 100 termsheets. The bank team should strike a balance between termsheets including the watchwords that occur most frequently and those including the watchwords that occur rarely, selecting roughly 50 from each category.

In addition to the 100 termsheets selected on the basis of watchwords as described above, the bank team then selects the following from the remaining termsheets of uncollateralised level 2 and level 3 positions:

•   an additional sample of 100 termsheets of the bank's most material positions;

•   an additional random sample of 100 termsheets.

As well as identifying the sample of 300 termsheets as described above, the bank team should also ask the bank to identify its most material positions exhibiting each of the following five specific features:

•   off-balance-sheet lending;

•   floored coupons;

•   notional linked to non-market event;

•   callable by the bank;

•   snowball.

In other words, for each feature the bank must identify its largest position that exhibits that feature. Where a bank states that it does not hold any position exhibiting a given feature, the bank team asks it to provide evidence in the form of trading mandates and control mechanisms which ensure that such instruments cannot be added to its books.

Review of bookings

The sampling process described above should result in a total of 305 termsheets to be reviewed manually by the bank team. The review needs to ensure that

•   all inputs (both static and dynamic) into the valuation model are correct and, by implication, that the model used can accommodate all the features of the position (as set out in the termsheet);

•   all inputs in the booking can be mapped to the termsheet;

- all features of the trade as set out in the termsheet are captured in the booking.

Any material issues identified by the bank team during its review should be flagged to the CPMO as early as possible. Depending on the findings, the CPMO may provide guidance on sampling/reviewing additional positions.

The overall objective of the review is twofold:

- to determine any remedial actions required to fix structural weaknesses in the bank's processes and practices for booking positions with complex features;

- to quantify adjustments to potential incorrect valuations for inclusion in the AQR-adjusted CET1%.

8.5.5   Outputs

The following outputs need to be produced for this workblock:

Table 1288

Outputs for the booking review

Workblock	Output
8. Fair value exposures review	• Complete T8D. Booking review findings template • O8D PowerPoint presentation describing any remedial action the bank should take as a result of the booking review

9 Determination of AQR-adjusted CET1% and definition of remedial actions for the bank following the CA

This section explains the approach for reflecting findings from the AQR in a way that achieves the objectives of the AQR while still being feasible to implement. After summarising the approach, it describes how the findings from the AQR should influence a bank's future reporting. It then describes the key aspects that the bank team must ensure the bank has captured in its reported CET1% to fully incorporate all aspects of CRR/CRD IV. Next, it explains how the AQR findings should be used to adjust the bank's reported CET1% to create an "AQR-adjusted CET1%" for use as an input to the stress test. Finally, it looks at the implications of the AQR for the bank's accounts at the next relevant reporting date.

9.1 Summary of the approach

No change in the certified accounts of banks as at the AQR reference date is required following the AQR (except in the unlikely event that the AQR highlights issues that would lead to restatement under local law, e.g. identification of accounting irregularities)[74].

The expectation is that certain findings from the AQR will be reflected in the bank's accounts in the accounting period following the AQR. These may include:

- corrections to specific provisions for individually impaired credit facilities that were sampled in the credit file review;

- corrections to specific provisions for collectively impaired credit facilities, where the bank's collective provisioning model is viewed by the bank team as missing crucial aspects required under accounting rules (e.g. discounting based on the EIR);

- creation of a CVA for derivatives.

Other findings from the AQR will not be included in the accounts for the period following the AQR reference date, as they are not strictly required under accounting rules. For instance:

- the extrapolation of findings from sampled files to the wider portfolio;

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[74]   IAS 8 applies for IFRS banks.

- adjustments to collective provisions driven by factors other than bank misalignment with accounting rules;

- adjustments based on third-party or NCA valuations of level 2/3 securities driven by factors other than bank misalignment with accounting rules.

To correctly account for all AQR findings, an AQR-adjusted CET1% is calculated for each bank. This AQR-adjusted CET1% is used to compute the final stress test outcomes. **The bank is not required to restate accounts or apply the AQR assumptions on an ongoing basis, in other words the AQR-adjusted CET1% is not a de facto alternative accounting standard.**

9.2 Indicative timeline

Table 129
Indicative timeline for the AQR-adjusted CET1% calculation

Task	Indicative date
Obtain bank CET1% parameters and verify that all capital requirements/deductions have been applied according to CRR/CRD IV	Week 12
Obtain all inputs necessary to populate template	Week 24
Complete population of AQR-adjusted CET1% template and submit to CPMO	Week 26
Obtain feedback from CPMO and incorporate in final report	Week 28

9.3 Illustrative models, parameter sheets and templates

The following illustrative models, parameter sheets and templates are relevant to this workblock:

Table 130
Illustrative models, parameter sheets and templates for the AQR-adjusted CET1% calculation

Template	Summary of contents	Frequency of submission to CPMO
T9 AQR-adjusted CET1% adjustment tool	Tool to adjust bank CET1% ratios based on results of AQR	At end of task

9.4 Checks on the bank's CET1% calculation

To understand the influence of losses identified in the AQR on each bank's capital requirements, the impact of the relevant findings on the bank's capital ratio must be considered.

First and foremost, it is critical that the bank fully applies the specific rules of CRR/CRD IV when determining the CET1%. Specifically, NCAs should ensure that the CET1% calculation has incorporated the following aspects appropriately:

- only eligible capital counted in line with CRR/CRD IV;

- all trading book capital requirements reflected;

- AVA adjustments included in line with CRR/CRD IV;

- provisions fully deducted from available capital;

- IRB provision shortfall deducted from available capital for IRB banks, with Article 159 of the CRR applied at the aggregate exposure level;

- prudential filters removed as appropriate (with phase-in).

They must also ensure that adjustments have been made for:

- gains and losses on own credit risk;

- cash flow hedge reserve.

Finally, they must ensure that appropriate deductions have been made (with appropriate phase-in) for:

- holdings in financial institutions;

- losses, goodwill and other intangibles;

- Deferred tax assets (DTAs);

- defined benefit pension fund assets;

- own CET1 instruments;

- reciprocal cross holdings;

- qualifying holdings outside the financial services sector, free deliveries, securitisations with 1,250% risk weight.

It is necessary for stress-testing purposes to understand how the CET1% ratio would change as phase-in is removed. As such, an analysis must be produced of the change in the CET1% ratio over time with different levels of phase in.

9.5 Determination of the AQR-adjusted CET1%

Once the bank's verified CET1% ratio is established, it should be adjusted to arrive at the AQR-adjusted CET1% ratio according to the specific rules for the AQR. The AQR-adjusted CET1% is an input to the stress test, allowing adjustments to be made to bank stress test projections if required.

The following principles are applied to arrive at the AQR-adjusted CET1%:

- The AQR-adjusted CET1% should be adjusted for deviations in estimates of provisions, reserves or level 2/3 valuations (both sampled and extrapolated findings).

- For the purposes of the AQR, we assume the IRB provisioning shortfall does not change from the bank's current calculation given materiality and to ensure the feasibility of the exercise.

- Material offsetting impacts from increases in provisions and reserves or changes to valuations should be taken into account (e.g. tax effects when material).

- For the purposes of the AQR-adjusted CET1%, RWAs are not adjusted given materiality and to ensure the feasibility of the exercise, except for the impact of a change in the level of protection from risk transfer transactions/securitisations, etc. Of course, the bank would be expected to make the associated adjustments to RWAs once the accounts have been adjusted following completion of the CA.

- For institutions which, as at the AQR reference date, have chosen to apply transitional arrangements to mitigate the impact of the introduction of IFRS 9 on own funds, these transitional arrangements are taken into account in accordance with Regulation (EU) 2017/2395 of the European Parliament and of the Council of 12 December 2017 when reflecting AQR adjustments to impairments in the AQR-adjusted CET1%, subject to the following assumptions:

    - AQR adjustments do not affect the static component of the amount that is subject to transitional arrangements (i.e. the amount specified in paragraph 2 of REGULATION (EU) 2017/2395)[75];

    - only adjustments to impairments on exposures which are classified as stage 1 and 2 after the AQR classification review are taken into account for the dynamic component (i.e. the amount specified in paragraph 4 of REGULATION (EU) 2017/2395 in conjunction with paragraph 5, points (b) and (c)).

The following adjustments need to be made to the AQR-adjusted CET1%:

- adjustment for reclassification of exposures from amortised cost to fair value;

- adjustment to CVA charge;

- adjustment to available capital for changes to provisions;

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[75] The CPMO may consider exceptions in severe cases where the AQR results imply a material issue within the bank's IAS 39 provisions as at 31 December 2017. In such cases the CPMO requests further input from the bank during the execution of workblock 9 to verify that the static component applied for transitional arrangements is appropriate.

- adjustments to valuation of level 2/3 assets (or equivalent for nGAAP banks);

- offsetting impact of risk transfer mechanisms (e.g. securitisation, portfolio guarantees) on provisions, reserves and valuation adjustments;

- adjustments to available capital for tax effects;

- adjustments to RWAs for changes to capital relief from portfolio guarantees/securitisations under the supervisory formula approach (IRB banks only);

- other adjustments that may be required.

A template is provided for the required calculation so that results can be calculated and delivered in a standardised way. The following subsections cover each component of the template in a step-by-step way:

- step 1 – enter results of workblocks relating to accrual accounted assets;

- step 2 – enter results of workblocks relating to fair value exposures;

- step 3 – calculate AQR-adjusted CET1%.

The template is colour-coded as follows:

- **Yellow** – field to be populated based on data from banks, checked by NCAs;

- **Green** – field to be populated following completion of AQR;

- **Pink** – calculated field;

- **White** – sum totals.

9.5.1 Step 1 – enter results of workblocks relating to accrual accounted assets

The findings from the workblocks relating to accrual accounted assets are entered in step 1. For corporate exposures, findings observed in the credit file sample and findings from projections of findings (including collective provisioning adjustments) are entered separately for each portfolio. For retail exposures, the findings from challenger model analysis are entered for each portfolio (if any).

Space is allowed in the template for offsetting impacts of risk protection, such as from portfolio risk transfer transactions or securitisations. Space is also allowed in the template for taking tax effects into account (with scope to adjust the tax effect for different levels of CRR/CRD IV phase-in).

The total net impact on provisions is summed across in-scope corporate and retail portfolios and the adjustment to capital calculated for all portfolios.

Not all fields are expected to be populated as most banks may have relatively few portfolios in scope.

9.5.2   Step 2 – enter results of workblocks relating to fair value exposures

In the section on fair value exposures, three types of adjustments are required (where relevant):

- reclassifications of accrual accounted assets to fair value;

- adjustment to the CVA charge based on CVA review and the challenger model (note – no adjustment is made to DVA as the adjustment is a capital adjustment and DVA is deducted from capital);

- revaluation of level 2/3 fair-valued exposures.

An adjustment is entered for all assets in accordance with the applicable CRR/CRD IV phase-in.

Parameters may also need to be entered for the offsetting impact of risk protection, e.g. from portfolio guarantees.

Parameters may also need to be entered based on NCA input to take account of tax effects from movements in valuations as appropriate under local tax rules. There is scope to reduce the impact of tax effects following phase-in of DTA rules.

9.5.3   Step 3 – calculate AQR-adjusted CET1%

In step 3, the bank's reported CET1% ratio as at the AQR reference date is adjusted to determine the AQR-adjusted CET1% for application in the stress test. This involves reading in the total adjustment to available capital from steps 1 and 2 and adding the adjustment to the bank's reported available capital.

If the bank has received an offsetting impact from risk protection schemes, the bank team/NCA should assess whether an adjustment should be made to RWAs for the reduction of RWA relief from the risk protection scheme under the supervisory formula approach. This is because the AQR may imply that adjustments need to be made to the parameters of the supervisory formula (i.e. input parameters to Kirb). This is only required if an offsetting benefit from a risk protection scheme is received in step 1 or 2.

9.6 Specific list of adjustments that the bank may be expected to include in future accounts or other relevant external reporting

The AQR may lead to a wide range of findings which may or may not need to be included in the bank's accounts or other external reporting. The expectation is that findings will not require historical restatement unless required under local law or accounting rules (for IFRS banks, IAS 8 applies). However, there may be other changes that should be incorporated into future accounts. Issues that may be expected to be included in future accounts are:

- adjustments to bank policies that are not in line with accounting rules (e.g. approach to collateral valuation, use of collateral valuation for provisioning purposes);

- issues with bank processes that mean policies relating to impairment staging triggers or provisioning calculations are not applied appropriately;

- changes to the approach to reserves for derivative pricing models (quantum and approach);

- changes to the classification of assets into amortised cost, FVTPL or FVTOCI (or nGAAP equivalents);

- changes to the classification of assets in the fair value hierarchy;

- revaluation of specific level 2/3 securities or inclusion of reserves based on approaches applied by NCAs/third parties;

- development or adjustment of CVA models;

- increased parameter uncertainty or model reserves for pricing models where issues are found;

- revision of specific DCF models for individual sampled files;

- portfolio-wide reassessment of provisions to ensure that findings from sampled files have been addressed in all cases.

A report should be produced for each bank setting out the remedial actions required. This report should be provided to the bank in the form of a letter to management requiring the prescribed actions. A standard template is provided to make ongoing monitoring of remedial actions more straightforward.

9.7 Outputs

The objective of this workblock is twofold:

- To produce an AQR-adjusted CET1% that can be used for the purposes of the stress test to make adjustments for all incurred and projected findings from the AQR[76]. This parameter is not used to adjust the bank's reported capital ratios.

- To allow a letter to be drafted to the bank outlining all findings from the AQR that the bank should, under local law, be required to incorporate in its accounts.

The following output needs to be produced for this workblock:

Table 131

Outputs for the AQR-adjusted CET1% calculation

Workblock	Output
9. AQR-adjusted CET1% ratio	• Completed T9. AQR-adjusted CET1% adjustment tool • O9B Draft letter to bank outlining actions that should be taken as a consequence of the AQR (referencing output O1B, O2B, O3B, O4B, O7B, O8D)

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[76] Incurred losses would be expected to be reflected in the bank's Pillar 1 capital requirements following the CA, while other findings would be expected to be reflected in Pillar 2 assessments.

10   QA and progress tracking

This section outlines the approach for QA and progress tracking. QA and progress tracking are two complementary processes with the joint goal of ensuring the accurate and timely delivery of Phase 2 in a standardised manner across all banks. Both processes follow a three lines of defence model, with all three lines jointly responsible for ensuring the quality of the overall AQR outcomes.

Bank teams form the first line and are responsible for the accurate and timely execution of the AQR in line with guidance issued by the CPMO. The NCA forms the second line, independently performing plausibility checks on the work of the bank teams, closely monitoring their progress and escalating issues to the CPMO as required. The CPMO forms the third line of defence, reviewing and challenging the execution of the AQR from an SSM-wide perspective and conducting a focused investigation of specific issues as required. Progress tracking is coordinated within the fortnightly PMO reporting process to minimise the additional work required.

10.1   Summary of approach

Table 132
Overview of progress tracking, QA structure

- The exact structure of the NCA QA teams varies by country. They are all constructed on the same principles, however, namely performing plausibility and completeness checks on analysis and acting as a second line of defence for the AQR. This ensures that any issues can be identified promptly, thus avoiding problems later in the exercise when issues are identified that have previously gone unnoticed.

- Both QA and progress tracking are carried out in some capacity at each of the three levels of defence. The responsibilities of each stakeholder are detailed in the following table.

Table 133

Summary of responsibilities for QA and progress tracking

Stakeholder	QA	Progress tracking
CPMO	Review and challenge to ensure consistency from a cross-SSM perspective; investigate specific issues as required and deemed appropriate by the ECB	Review and challenge the Phase 2 plan submitted by the NCA Coordinate the fortnightly PMO reporting process Coordinate interim progress reporting as required
NCA	Perform plausibility checks on the output of the bank teams Review outputs at a high level (i.e. portfolio level) for consistency across banks in the country Raise all issues identified to the CPMO via the QA issue log	Carry out detailed planning of the Phase 2 process for all relevant banks, across all workblocks Aggregate templates from banks, followed by regular timely submission
Bank teams	Execute the AQR accurately in line with the guidance issued by the CPMO	Execute the AQR in a timely manner, in line with plans and timelines agreed with the NCA

Neither the exact structure nor the exact approach that an NCA should use internally for QA or progress tracking are prescribed in precise terms in this manual. Each NCA is responsible for ensuring that the approach it chooses to follow meets its responsibilities – this will be reviewed and challenged by the CPMO during the QA exercise to assess fitness for purpose. However, further guidance is provided in an annex to this document.

QA does not need to be repeated by both home and host SSM NCAs. Each should retain responsibility for QA of the tasks they are responsible for.

As a minimum, the NCA should direct all information and communication during Phase 2 to the CPMO through the relevant set of templates provided, as summarised in the following table.

Table 134

Summary of templates used in communication between NCA and CPMO

Template	Purpose	Frequency of submission by NCA via Darwin
PMO templates	For use in the regular fortnightly CPMO PMO reporting cycle	Fortnightly
FAQ templates	To record questions regarding interpretation of AQR methodology	Daily
QA issue log	To record specific QA issues identified by the NCA	Weekly
Output templates	To capture data submitted for each Phase 2 workblock	As per Table 2

The CPMO will publish the responses to the FAQs on a regular basis.

Issues encountered during Phase 2 are dealt with using a range of remedial actions, aimed at allowing the bank in question to complete the exercise on time or to the specified quality level.

Actions proposed are escalated to a commensurate level within the ECB and may include, for example, the application of conservative assumptions or workarounds, or re-execution of portions of the AQR where required.

The following table provides guidance on the key basic checks that should be carried out for each template before submission to ensure that they have been filled out completely.

Table 135

Summary of responsibilities for QA and progress tracking

Workblock	Output	Key checks
1. PP&A review	T1. Processes, policies and accounting review assessment template	All questions have been answered, with appropriate evidence available to justify answers
	O1B. PowerPoint presentation on all remedial actions that the bank is required to undertake following the CA as a consequence of the PP&A review	All issues identified either have a remedial action described or a satisfactory explanation has been provided setting out why remediation is not required
2. Loan data tape creation and DIV	T2B. DIV monitoring template	All checks have been performed
		Remediation strategies have been defined for all relevant issues
	O2B. PowerPoint presentation describing any remedial action that the bank should take as a result of DIV following CA	All issues identified either have a remedial action described or a satisfactory explanation has been provided setting out why remediation is not required
3. Sampling	T3. Sampling rates template	Data have been entered into the sampling rates template correctly
		Prescribed sampling rates have been applied accurately
		Sample chosen reflects prescribed sampling rates for each stratum
4. Credit file review	T4B. Credit file review findings template	Template is populated for all sampled credit files
		Key metrics and multiples (e.g. cash flow multiples) aligned with AQR guidelines (or satisfactory explanation provided)
	O4B. PowerPoint presentation describing any remedial action that the bank should take as a result of credit file review	All issues identified either have a remedial action described or a satisfactory explanation has been provided setting out why remediation is not required
5. Collateral and real estate valuation	T5. Collateral and real estate valuation template	Template is populated for all sampled collateral and real estate
		Valuation guidelines have been followed in full
6. Projection of findings	T6. Projection of findings tool	Findings from credit file review have been entered into tool accurately and projection of findings has been performed in line with AQR rules for all relevant metrics
7. Collective provision analysis	T7. Collective provisioning results template	Template is fully populated for all required segments
		Challenger models have been reviewed and found to be consistent with guidelines for AQR
		Top-down checks and benchmarking performed on parameters to ensure relationship between provisioning rates by segment is logical
	O7B PowerPoint presentation describing any remedial action that the bank should take as a result of collective provision analysis	All issues identified either have a remedial action described or a satisfactory explanation has been provided setting out why remediation is not required
8. Fair value exposures review	T8A. Revaluation of non-derivative assets findings template	All sampled assets have been revalued in line with guidelines
		Explanation provided for the choice of valuation
		Findings have been extrapolated where appropriate (i.e. securitisations)
	T8B. Core trading book processes review findings template	All questions have been answered, with appropriate evidence available to justify answers
	T8C. Derivative pricing model review findings template	All questions have been answered, with appropriate evidence available to justify answers
		Quantification of key issues has been made where appropriate
	T8D. Booking review findings template	All questions have been answered, with appropriate evidence available to justify answers
		Quantification of key issues has been made where appropriate
	O8D. PowerPoint presentation describing any remedial action that the bank should take as a	Any non-derivative portfolio that requires wider revaluation

	result of fair value exposures review	has been identified
		All issues with core processes or pricing models either have a remedial action described or a satisfactory explanation has been provided setting out why remediation is not required
		Clear statement has been provided explaining where derivative fair value reserves should be made, with appropriate evidence provided
9. AQR-adjusted CET1% ratio	T9. AQR-adjusted CET1% adjustment tool	Template is populated accurately based on outputs of other templates, fully in line with accounting rules
	O9B Draft letter to bank outlining actions that should be taken as a consequence of the AQR (referencing output O1B, O2B, O3B, O4B, O7B, O8D)	Draft letter has been completed covering all relevant issues

10.2 Indicative timeline for QA

NCAs are expected to complete their own QA before final outputs are submitted to the CPMO. Clearly, if templates are submitted on an interim basis some degree of QA is expected to have been carried out, but it may not be fully completed. Timelines for the completion of NCA QA are agreed between the CPMO and each NCA at the start of the exercise.

10.3 Overview of QA

This subsection provides further detail on QA. It covers roles and responsibilities and gives an overview of the expected interactions during the QA process.

QA is a continuous process and ensures consistent and high standards of work across each component of the AQR. QA is conducted by both NCAs and the CPMO. If an NCA is executing an element of the Phase 2 work, an operating model should be defined which ensures that a four-eyes principle is applied. The scope of QA is large, as it needs to cover each of the ten workblocks of the AQR.

This manual does not prescribe an exhaustive set of checks and investigations that NCAs should carry out in order to fulfil their QA responsibilities. Each NCA is still responsible for choosing an approach commensurate with its situation that allows it to fulfil its responsibilities.

10.3.1 Roles and responsibilities

The roles and responsibilities of stakeholders, with reference to Figure 46: Overview of progress tracking, QA structure, are as follows.

Bank team responsibilities

- executing the AQR in an independent and confidential manner from the bank itself, and raising issues to the NCA within a timeframe commensurate with the materiality of the issue, for example:

  - if a material issue is found that may have an impact on the market or suggests fraud, this should be raised immediately to the NCA and not discussed with the bank;

- executing the AQR accurately and within agreed timelines;

- working closely with the NCA PMO and QA teams; note that the bank team does not normally interact directly with the CPMO;

- flagging to the NCA any deviations from the AQR methodology or from guidance given in the FAQs.

JST/NCA responsibilities

- conducting QA on the work produced by the bank teams and ensuring that it is accurate before submission to the CPMO;

- providing methodological guidance to the bank teams consistent with the AQR methodology;

- aggregating questions that are not addressed by the manual or the FAQs and addressing them to the help desk;

- raising QA issues identified using the QA issue log and submitting this to the CPMO on a regular basis.

CPMO responsibilities

- conducting SSM-wide QA, e.g. through cross-country consistency checks, to ensure that the AQR is carried out accurately and consistently across the SSM;

- responding to technical questions raised via the help desk;

- managing the CPMO QA process at a country level, including communication between the CPMO and the NCAs on QA-related topics;

- providing technical guidance to the NCAs based on the AQR methodology;

- reviewing and challenging the QA work carried out by the NCAs, through on-site visits where appropriate;

- investigating country-level issues in detail, including on-site visits as required.

10.3.2 Overview of the CPMO QA process and resulting interactions with JSTs/NCAs

The purpose of this section is to provide an overview of the CPMO QA process and the likely resulting interactions with JSTs/NCAs. The CPMO uses the information provided in the templates to perform QA, and searches for potential issues by

- comparing AQR results across countries to ensure that the approach outlined has been applied consistently, and highlighting areas for further investigation where it has not;

- conducting spot checks on the AQR output;

- conducting on-site visits to gain a deep understanding of the QA process followed by the NCAs, and hosting a forum for reviewing and challenging the output that has been produced;

- reviewing any potential issues that NCAs have raised in the QA issue log that is submitted on a regular basis.

The CPMO maintains an open and constructive dialogue with NCAs regarding QA during the course of Phase 2. This includes conducting on-site QA visits and interviews as required and deemed appropriate by the ECB.

10.4 JST/NCA QA execution guidance

The purpose of this section is to provide guidance on the QA to be carried out by the JST/NCA for each of the AQR workblocks. The following table outlines a QA framework for the AQR that the JST/NCA can apply to each workblock. The framework may not be exhaustive, and the JST/NCA may use other tools as required to complete the QA.

Table 136
JST/NCA QA framework

QA tool	Rationale
1. Template checks	To ensure templates have been filled in completely and in line with the specified rules
2. Plausibility checks on calculations/sample assessments	To ensure accurate and consistent application of the AQR methodology
3. Comparison of parameters and outputs across segments, portfolios, banks	To identify potential areas of inconsistency for further investigation
4. Comparison of parameters or outputs against industry benchmarks or expert judgement	To ensure accuracy by sense-checking parameters and outputs
5. Discussion with bank teams on how they have applied the methodology	To ensure that the approach and rationale are consistent with the AQR methodology

The following subsections provide more specific guidance on the QA process for each workblock.

10.4.1 PP&A review

The PP&A review can begin immediately once bank teams have been established. An approach of "constrained expert judgement", i.e. prescriptive guidelines, is applied to the process review to ensure that bank teams explicitly address all necessary issues. Objective criteria help to avoid subjectivity and variability in standards across countries.

For the purposes of the PP&A review, the CPMO provides the JST/NCA with the processes, policies and accounting review templates as described in **Table 2**. The JST/NCA must submit the completed templates to the CPMO once the exercise is finished, and produce a PowerPoint presentation on all remedial actions that the bank is required to undertake following the CA as a consequence of the PP&A review.

JST/NCA responsibilities include

- checking that the template is fully populated;

- checking that bank template responses have been signed off by an appropriate and identified senior officer;

- checking that evidence is available for answers in the template;

- checking that all issues identified have appropriate corresponding remedial actions (together with specified timelines, i.e. within Phase 2) or that a satisfactory explanation is provided setting out why remedial action is not required;

- checking that any remedial actions required during the course of Phase 2 (e.g. identifying the impact of reclassifying assets from amortised cost to fair value treatment) have been/are being carried out.

CPMO responsibilities include

- checking that templates are fully populated for all banks within the SSM;

- checking that the CVA challenger model has been completed for all banks within the SSM;

- checking that any Phase 2 remedial actions have been carried out, identifying any cross-country inconsistencies in quality and completeness;

- checking that accounting reclassifications (including any revaluations) have been incorporated into the AQR-adjusted CET1% template.

10.4.2 Loan tape creation and data integrity validation

For the purposes of loan tape creation, the CPMO provides the JST/NCA with a loan tape data dictionary as described in **Table 2**. This acts as a checklist for bank teams to ensure that banks have provided all the necessary data. Nothing needs to be submitted to the CPMO.

For the purposes of data integrity validation (DIV), the CPMO provides the JST/NCA with a DIV monitoring template as described in **Table 2**. This is an RAG assessment template for each check prescribed for DIV for each field/combination of fields. A weekly update must be submitted to the CPMO. At the end of the exercise the completed DIV monitoring template is submitted together with a PowerPoint presentation describing any remedial action that the bank should take as a result of DIV.

JST/NCA responsibilities include

- checking that DIV templates are fully and accurately populated using appropriate sources, identifying any cross-bank inconsistencies in quality;

- checking that all issues identified have appropriate corresponding remedial actions (with correct timelines, i.e. to fit within wider timelines of Phase 2), and ensuring that conservative proxies/workarounds are in place if remediation strategies cannot be completed within the timeframe of the exercise;

- checking that DIV findings are reported and ensuring that Phase 2 remedial actions have been carried out.

CPMO responsibilities include

- checking that templates are fully and accurately populated, identifying any cross-country inconsistencies in quality;

- checking that Phase 2 remedial actions have been carried out or that appropriate workarounds are in place;

- providing a final sign-off for significant remedial actions proposed by NCAs.

10.4.3 Sampling

Sampling should begin soon after the DIV process once a portfolio's loan tape has been completed. The sampling rates template provided by the CPMO constrains the way samples are selected. The tool is populated by the bank team. The JST/NCA should verify that the inputs are consistent with the contents of the bank's portfolios and that the outputs (in terms of sampling rates and projection of findings multiples) are taken directly from the tool without adulteration and used directly in the final

calculation of capital shortfall. The bank team must check that the sample composition is consistent with the one implied by the sampling tool, including "reserve" cases. Credit file collection continues until all samples are provided.

For the purposes of sampling, the CPMO provides the JST/NCA with the sampling rates template as described in **Table 2**. This tool determines sampling rates for each portfolio for each stratum. An interim version should be provided two weeks after the DIV process begins, with a final update supplied two days after DIV is finished.

JST/NCA responsibilities include

- verifying that the sampling strata have been correctly defined:

  - no buckets missing, e.g. the Higher Risk Cured bucket is missing across all of the exposure size buckets or exposure size bucket number 3 is missing across all of the riskiness buckets;

  - correct number of buckets of the correct size;

- verifying that the correct number of debtors have been selected:

  - number of debtors included in each fifth percentile bucket represents 5% of the number of debtors in the corresponding riskiness bucket;

  - number of debtors included in each priority sample bucket is correct;

  - sample selected conforms to the appropriate number for the bucket;

- verifying that the sample of debtors has been selected at random and that all steps set out in the section on sampling are followed.

CPMO responsibilities include

- ensuring that correct sampling rate parameters have been applied.

10.4.4   Credit file review

The CPMO provides the JST/NCA with a credit file review findings template to capture the findings of the credit file review for each debtor. This template must be submitted to the CPMO on a weekly basis until it is complete. The JST/NCA must also produce a PowerPoint presentation describing any remedial action that the bank should take as a result of the credit file review. In addition, the CPMO provides a parameter sheet for collateral indices and other macro indices.

JST/NCA responsibilities include

- sense-checking the results of classification reviews against expected results based on the PP&A, provisioning levels and previous JST/NCA findings;

- performing spot checks on classification reviews, particularly for high-risk items not classified as credit-impaired and/or NPE;

- sense-checking the results of provisioning reviews against expected results based on the PP&A, provisioning levels, cross-bank comparison and previous JST/NCA findings;

- performing plausibility checks on key metrics of the individual impairment review that are not in line with the manual (e.g. low haircuts for collateral, high EBITDA multiples);

- performing spot checks on cash flow projections for the individual impairment review;

- reviewing the remedial actions report and ensuring that it is complete.

CPMO responsibilities include

- performing cross-bank and country analysis to ensure that AQR rules are applied consistently;

- performing spot checks on outliers/apparent deviations from guidelines.

10.4.5   Collateral and real estate valuation

Before starting collateral valuation analysis, the JST/NCA is asked to provide key high-level assumptions that it believes are appropriate for its market (e.g. ranges for yields or valuation per square metre by region and type of property). These are reviewed by the CPMO to ensure that a consistent approach is applied across markets.

All bank teams are asked to complete a single template containing findings for all collateral items they revalue. This includes the specific key assumptions applied for each property. The JST/NCA must then ensure that the specific key assumptions are in line with the high-level assumptions described above and agreed with the CPMO. Any deviations that are accepted must be flagged to the CPMO.

For the purposes of collateral valuation, the CPMO provides the JST/NCA with the collateral and real estate valuation template as described in **Table 2**. This template captures information on collateral revaluations and must be submitted to the CPMO on a weekly basis until it is completed.

JST/NCA responsibilities include

- obtaining reasonable assurance from the bank team that collateral items for the sample have been identified and forwarded to the correct parties for revaluation, and understanding the reasons where this is not the case;

- obtaining reasonable assurance that decisions on which collateral should be revalued and which should be indexed has been made appropriately;

- ensuring that instructions to property appraisers are consistent with AQR requirements;

- performing spot checks on unusual cases;

- obtaining reasonable assurance that findings from the collateral review have been fed into the other relevant workstreams, i.e. collective provisioning, credit file review and fari value exposures review.

CPMO responsibilities include

- performing cross-bank and country analysis to ensure that AQR rules are applied consistently;

- performing spot checks on outliers/apparent deviations from guidelines.

10.4.6   Projection of findings of credit file review

For the purposes of projecting the findings of the credit file review, the CPMO provides the JST/NCA with the projection of findings tool as described in **Table 2**. This takes the results of the credit file review and projects findings for the unsampled exposure for the relevant portfolio. These results are used in the AQR-adjusted CET1% ratio template.

JST/NCA responsibilities include

- verifying that projection of findings is completed accurately and that steps laid out in Section 6 are followed.

CPMO responsibilities include

- checking that projection of findings has been performed where required and in accordance with the guidelines specified.

10.4.7 Collective provision analysis

Collective provision analysis can begin on an unadjusted basis (with findings from file review taken into account later in the process). The bank team is required to produce a summary table of collective provision analysis parameters. The JST/NCA sense-checks the parameters against expectations and verifies that there are no issues with unexpected findings. This may involve requests to review and verify the specific spreadsheets or code used to produce the summary tables. This is likely to be a two-step process: first checking the analysis with no adjustment for credit file review (around 1-2 months after DIV is completed), then reviewing the final analysis once collective provisioning models have been adjusted to take account of the findings from credit file reviews.

The summary tables (at step 1 and 2) are also provided to the CPMO, which performs its own checks of the key parameters in the form of a cross-country analysis to ensure appropriate consistency. The JST/NCA reviews the rationale for disregarding findings where the collective provision analysis implies that the bank was underprovisioned for any portfolio, obtaining reasonable assurance that it is comfortable with the conclusions and that a consistent approach has been applied between banks. If the JST/NCA conclusion differs from the bank team results, the bank team is asked to either provide more evidence or change its findings. Any situation where either the bank team or the JST/NCA conclude that the bank's model is insufficient must be reported to the CPMO for further validation.

JST/NCA responsibilities include

- obtaining reasonable assurance that parameters have been determined in line with AQR guidelines;

- verifying that decisions to disregard any deviations are appropriate;

- reviewing the findings of the bank team regarding the bank's collective provisioning model;

- reviewing decisions to override/not override the bank model;

- sense-checking challenger model parameters based on typical experience;

- obtaining reasonable assurance that challenger model parameters are adjusted for credit file review findings.

CPMO responsibilities include

- performing cross-bank and country analysis to ensure that AQR rules are applied consistently;

- performing spot checks on outliers/apparent deviations from guidelines.

10.4.8 Fair value exposures review

All four components of the fair value exposures review require QA and progress tracking. As with the PP&A review, an approach of "constrained expert judgement" is applied to ensure that bank teams explicitly address all issues in a consistent manner. The four components of the fair value exposures review are:

- non-derivative assets review;

- trading book core processes review;

- derivative pricing model review;

- booking review.

10.4.8.1 Revaluation of non-derivative assets

For the purposes of revaluing non-derivative assets, the CPMO provides the JST/NCA with a template for presenting the results of the revaluations. The template should be submitted to the CPMO twice – first when the positions are entered, and then again once it has been completed. A report should also be produced describing any remedial action that the bank should take as a result of the revaluation.

JST/NCA responsibilities include

- ensuring that the correct positions have been selected for revaluation for each asset class (e.g. Top 20);

- checking that the valuer has used an appropriate approach to revalue the chosen positions for each asset class;

- checking that the comparison with the bank valuation has been conducted in an appropriate way and that any findings are reported appropriately in results.

CPMO responsibilities include

- performing cross-bank and country analysis to ensure that AQR rules are applied consistently;

- performing spot checks on outliers/apparent deviations from guidelines.

10.4.8.2 Trading book core processes review

For the purposes of the core processes review, the CPMO provides the JST/NCA with the core trading book processes review findings template. This contains a questionnaire for the core processes review that includes codified definitions of

Red/Amber/Green for each element of the review. This should be submitted to the CPMO once completed. A report should also be produced describing any remedial action that the bank should take as a result of the review.

JST/NCA responsibilities include

- checking that the template is fully populated;

- checking that appropriate data has been received to objectively determine the RAG score;

- checking that appropriate evidence has been provided to support conclusions.

CPMO responsibilities include

- reviewing remedial actions recommended by the review;

- performing cross-country consistency checks.

10.4.8.3 Derivative pricing model review

For the purposes of the derivative pricing model review, the CPMO provides the JST/NCA with a template for assessing the pricing models with codified definitions of High/Medium/Low (H/M/L) for each element of the review. The template captures the quantitative adjustments for all in-scope pricing models. The template should initially be completed when the questionnaire is completed, then subsequently once a fortnight. A report should also be produced describing any remedial action that the bank should take as a result of the review.

10.4.8.4 Booking review

For the purposes of the booking review, the CPMO provides the JST/NCA with the booking review findings template. This contains a list of the termsheets sampled, the basis for their selection and a summary of the bank team's findings. The template should be submitted to the CPMO once completed. A report should also be produced describing any remedial action that the bank should take as a result of the review.

JST/NCA responsibilities include

- checking that the template is fully populated;

- checking that appropriate data has been received to objectively determine the H/M/L score;

- checking that the methodology explanation given for reserve calculations is sufficiently detailed;

- checking that a quantification of impact has been determined where required and validated by an appropriate valuer.

CPMO responsibilities include

- performing cross-bank and country analysis to ensure that AQR rules are applied consistently;

- performing spot checks on outliers/apparent deviations from guidelines.

10.4.9   Determination of AQR-adjusted CET1% ratio

The JST, which includes the relevant NCA, must write a letter to banks outlining the required adjustments that need to be made to accounts, other regulatory submissions, policies and processes. The JST should also provide guidance on which rules should be included in the calculation where these are not fully defined for future reporting periods.

A template is provided for calculating the AQR-adjusted CET1%. The NCA must verify that the template has been completed correctly, which includes checking that all deductions included in the Single Rule Book[77] have been made (with and without appropriate phase-in).

JST/NCA responsibilities include

- checking that the AQR-adjusted CET1% template is completed fully;

- checking that banks have applied appropriate CRR/CRD IV rules when calculating the CET1% ratio (pre-AQR adjustment).

CPMO responsibilities include

- checking that calculations are performed in line with instructions and adjustments;

- challenging specific issues on an exceptional basis;

- ensuring that the letter to banks covers all relevant issues.

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[77]   Article 36 of the CRR (a.k.a. the CRD IV Single Rule Book).

10.5 Outputs: QA issue log

The objective of QA is to ensure accuracy and consistency in the application of the AQR and thus lend credibility to the process. During the QA process, issues are identified that need to be addressed appropriately. With this in mind, the CPMO provides the JST/NCA with a QA issue log that offers

- a common language that the CPMO and the JST/NCA can use to communicate issues;

- a tracking tool for any issues identified, ensuring that they are recorded, assessed and appropriately addressed at the correct level within the ECB;

- an aid to open and direct communication between the JST/NCA and the CPMO on issues affecting the AQR;

The JST/NCA submits the QA issue log to the CPMO on a weekly basis. It comprises a cumulative log of issues that the NCA has identified across its relevant banks and is used as an input to the CPMO QA process.

10.6 Progress tracking

10.6.1 Roles and responsibilities

This section details the roles and responsibilities of the various stakeholders, with reference to Figure 46: Overview of progress tracking, QA structure, as follows.

Bank team responsibilities

- designing a detailed plan for each bank for the AQR exercise, for discussion and agreement with the respective NCA PMO;

- submitting completed templates to the NCA on a weekly basis;

- flagging to the NCA PMO any potential delays or issues that may threaten delivery as per the agreed plan.

JST/NCA PMO responsibilities

- tracking and delivering Phase 2 at a country level, and coordinating interactions between the NCA QA team, the bank teams and the CPMO;

- leading the design and implementation of mitigation plans and liaising with the bank teams to implement these;

- coordinating and aggregating AQR outputs for all relevant banks and uploading them to Darwin in a timely manner;

- aggregating weekly submissions from all banks to provide a country view using the automatic aggregation tool provided by the CPMO;

- escalating issues to the CPMO if there are delays or issues that may threaten delivery as per the agreed country-level plan;

- managing the regular fortnightly CPMO PMO reporting cycle, including submission of materials and attendance at meetings; this process forms the basis of central Phase 2 tracking by the CPMO and is therefore very important.

CPMO PMO responsibilities

- producing materials for updating the Comprehensive Asset Steering Committee (CASC), and bringing key issues to its attention;

- reporting overall progress at bank level based on the information received in the templates from the NCA PMO;

- challenging progress reports produced by the NCA and demanding creation of remediation plans if issues are found.

10.6.2   Process and reporting timelines

Progress tracking is conducted in conjunction with the current Phase 2 PMO fortnightly reporting process – the processes are closely aligned to reduce the administration required. The fortnightly PMO templates will not change and will continue to be used in the same manner as before, along with the same processes. The JST/NCA PMO is required to submit the aggregated set of templates from across the banks to the CPMO via Darwin on a regular basis, at the frequency stated in **Table 2**. Where a submission is required at the end of a process or task, the JST/NCA may send the submission prior to the deadline.

The bank-level AQR templates are used for progress tracking, for example by monitoring the number of completed fields compared with the number of outstanding fields in each template. The CPMO PMO provides a tracking tool that each JST/NCA may use as it sees fit – this tool provides a progress dashboard based on the underlying templates that are being filled in across the banks.