EUROPEAN CENTRAL BANK

EUROSYSTEM

COMPREHENSIVE ASSESSMENT STRESS TEST MANUAL

In 2014 all ECB publications feature a motif taken from the €20 banknote.

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Definitions

The following definitions are used throughout the manual:

Term	Definition
Distance to default	A transformation of PD into an inverse normal parameter
DIV	Data Integrity Validation
EI	The expected impairment result for a portfolio created by the AQR's collective provisioning approach
EL	Expected loss
IRB	Internal rating-based approach
LGD	Loss given default. May refer to either the point-in-time or regulatory parameter
LGD PIT	The point-in-time loss given default used to calculate the loss rate on new defaults
LGD REG	The IRB model LGDs used for calculation of regulatory EL and RWA
LGI	The loss given impairment result for a portfolio created by the AQR's collective provisioning approach
Parameter	A single number (e.g. PD, LGD, EAD)
PD	Probability of default. May refer to either the point-in-time or regulatory parameter
PD PIT	The point-in-time probability of default used to calculate the default rate in each year of the stress in accordance with the EBA methodology
PD REG	The IRB model PDs used for calculation of regulatory EL and RWA
PI	The probability of impairment result for a portfolio created by the AQR's collective provisioning approach
PP&A	Processes, policies and accounting review component of Phase 2 of the AQR
RWA	Risk weighted assets
STA	Standardised approach

INTRODUCTION

The ECB's comprehensive assessment of banks deemed significant under the Single Supervisory Mechanism (SSM) encompasses two key elements that will help ensure a consistent, comprehensive and transparent treatment of individual bank results within the exercise: (i) a systematic and centrally-led quality assurance of the stress test outcomes produced by the banks, and (ii) a "join-up" of the asset quality review (AQR) and stress test outcomes.

This manual covers both these elements of the comprehensive assessment. It first sets out in detail how the envisaged stress test quality assurance process will be carried out and then describes the methodology for combining the results of the AQR and the stress test. The methodologies for the AQR and the stress test are specified in separate publications[1], which, together with this manual, provide the complete methodology and process manual for the quantitative component of the comprehensive assessment.

The manual is divided into two parts.

- The first part broadly describes the checks on the stress test outcomes produced by SSM banks, which will be performed during a thorough and centrally-led quality assurance conducted by the ECB and national competent authorities (NCAs). The purpose of a centrally-led and harmonised quality assurance is to ensure that the comprehensive assessment results are consistent across banks, thereby providing a level-playing field and enhancing the credibility of the exercise as a whole. This manual also describes the approach that will be taken if results do not meet defined thresholds.

- The second part of the manual sets out the methodology for integrating the results of the AQR and the stress test. A key strength of the comprehensive assessment is that the results of the AQR will be used to adjust the starting point balance sheet applied in the stress test. To the extent that year-end 2013 balance sheet figures are adjusted by the AQR, these changes will result in the re-assessment of projected results produced in the stress test. The process of joining the AQR and stress test outcomes will to some extent be centrally-led, as the full AQR results cannot be disclosed to the banks sufficiently in advance of the publication date to allow for a bank-led approach. For certain elements of the AQR outcomes, banks will be required to carry out the join-up themselves, subject to appropriate quality assurance at the central level. This manual specifies the methodologies for the join-up at the central level (by the ECB and NCAs) and at the bank level.

[1] See EBA Methodology EU-wide Stress Test 2014 (April 2014) and ECB Asset Quality Review Phase 2 Manual (March 2014).

The quality assurance and the join-up are integral parts of the comprehensive assessment stress test process, which is divided into four phases.

- Phase 1 (May-June): Bank-led stress test [completed]
- Phase 2 (July-August): Quality assurance [ongoing]
- Phase 3 (September): Join-up
- Phase 4 (September-October): Finalisation and disclosure

During **Phase 1 (bank-led stress test)**, the banks lead the process by producing a stress test result in line with the EBA methodology. In addition, the banks will modify their results for the AQR processes, policies and accounting (PP&A) review and data integrity validation (DIV) exercise as discussed with their NCA. The banks may use centrally-provided credit risk benchmark parameters for key portfolios in the stress test. Furthermore, banks need to apply a specified approach for sovereign exposures held in the banking book. Moreover, for the purpose of the stress test quality assurance work by NCAs and the ECB, banks participating in the exercise are required to supply additional (SSM) templates as well as a narrative document explaining the approaches taken to generate the results and to justify the results created.

During **Phase 2 (quality assurance)**, the ECB and NCAs will conduct a series of tests, including comparisons to in-country peers, all SSM significant bank peers and other specified checks outlined in this document, together with comparisons to the results of the ECB's top-down stress test model. The quality assurance (QA) process will have a Red/Amber/Green (RAG) threshold approach. Green results will be considered to be in line with the EBA methodology and will not necessarily require modification. Amber results will be subject to a "comply or explain" test, for which the thresholds for "explain" are laid down clearly and require objective evidence (e.g. two economic cycles to demonstrate low sensitivity of a portfolio to interest rate effects). Red results will indicate non-compliance with the EBA methodology and will thus need to be modified. During this process, it is possible that some banks will perform further analysis and may resubmit stress test outcomes to support a result that is satisfactory to the NCA and the ECB.

During **Phase 3 (join-up)**, the quality-assured stress test results will be joined-up with the AQR results. In many cases where there has been an AQR modification for a portfolio, the corresponding stress test portfolio results will be modified. For example, if the AQR exercise concludes that a default identification in a portfolio has not been undertaken satisfactorily, then the bank's estimates of PD PIT projections will be challenged and potentially changed. This process will largely be conducted centrally by the ECB – in conjunction with the NCAs who

have detailed data on the individual banks from the AQR – and, for certain elements, join-up calculations will be carried out at the bank level. Again, the join-up will be quality assured by the ECB and NCA to ensure consistent and accurate application of the methodology.

During **Phase 4 (finalisation and disclosure)**, the NCAs and ECB will finalise the results, associated disclosure templates and capital requirements and share partial, preliminary information on specific components of the comprehensive assessment with banks, to enable them to mount a challenge on items of concern. Final results will be communicated to the banks very shortly before publication.

1 QUALITY ASSURANCE

The ECB and the NCAs will work together to conduct a robust QA exercise, building on the EBA's guidance. Parts of the QA will rely on the expert judgement of the QA experts in the NCAs and the ECB, and will include discussions in which the banks are invited to defend their results. In addition, many of the more important items in the stress test will be subject to a threshold-based evaluation, where bank results may be adjusted if they do not meet criteria, placing the burden of proof on the bank rather than on the NCAs and the ECB.

The purpose of the QA exercise is to ensure that banks apply the prescribed methodology and translate the impact of the baseline and adverse scenarios on their balance sheet in an appropriate manner.

In addition, the QA process is designed to:

- Ensure a level playing field:
    - Without a robust QA process, more conservative banks will be penalised relative to those that have taken less prudent approaches, which would be manifestly unfair. A robust QA process will address such issues.
- Focus on material issues:
    - The QA process is designed to quickly focus on areas where the bank's stress test results may materially underestimate the capital impact of the stress test.

Banks are subject to a "comply or explain" requirement. Reflecting the fact that the EBA exercise is a bottom-up stress test exercise, the QA process defines standards of evidence that banks should provide on a "comply or explain" basis, when numbers appear materially optimistic.

As described in the Introduction, the QA runs from the start of July to the end of August on stress test results only. The join-up will take place in September, with any associated additional join-up QA required occurring during this time. The QA will be led by the ECB in coordination with NCA teams. The approach and tests described in this chapter refer to the process that will be used for the QA of the pre-join-up stress test results.

The approach to QA will be to:

Focus on those areas of banks' stress test results that may materially underestimate the capital impact of the stress. The focus will be on, first, the banks' "raw", i.e. pre-AQR adjusted, results and, second, on the adjustment of the stress test results as part of the join-up. The analysis of the banks' pre-AQR-adjusted stress test results will both consider the approach used to calculate the results and examine the results themselves quantitatively.

Specify a number of quantitative checks to be performed on banks' submitted results. These constitute a minimum standard to be applied consistently across all countries. These QA tests will not be applied in a mechanistic manner, but will be subject to a prioritisation based on the effect of the line items identified on the bank's Common Equity Tier 1 ratio (CET1%). NCAs may, in addition, apply further tests – however, these may only add conservatism and cannot reduce the impact of the ECB-defined QA tests. Similarly, during the QA process, the ECB stress test QA team may decide when reviewing individual bank results to run additional QA tests, if this is deemed relevant for ensuring the quality of the stress test results.

Specify Red/Amber/Green thresholds for these checks:

- "Green" results are those which have not triggered any pre-defined Amber or Red thresholds.
- "Amber" results will be subject to a "comply or explain" test where the bank can provide statistical evidence that the results provided are sufficiently conservative. Standards of evidence for such tests are specified by the ECB; if standards are not met then results may be adjusted.
- "Red" results indicate clear breaches of EBA methodology and banks will be required to resubmit results.

Upon receipt of the stress test templates, standardised reports will be created mechanically through a tool that will specify Red/Amber/Green classifications for each test and portfolio. These reports will form the basis of QA engagement with the banks and will be provided to the NCA QA teams. After a period of discussion between the ECB and the NCA, QA engagement will then be run with the supervised banks led by the NCA and involving the ECB in trilateral

discussions. Specifically, banks will be asked to restate stress test results in the case of "Red" results, and to either restate or provide further evidence supporting their results in the case of "Amber" results. The interaction with the banks will be led by the NCAs, with the ECB involved directly in bank discussions where required.

In order to ensure a level playing field across countries, a prioritisation approach will be taken to addressing the Amber checks. This will focus on the Amber cases which have the most material impact on the CET1 capital ratio (or an approximation of the CET1 capital ratio where this cannot be easily calculated directly), defined by the CET1 capital ratio difference between the Amber threshold and the bank result (i.e. in addition to focusing on parameters and portfolios that are more material, results that are further from the Amber threshold will be more material than those that are closer to the Amber threshold). For the purposes of prioritisation, Amber checks will be ordered by materiality and addressed in order of importance.

The result of the QA tests will be a report for each bank indicating the result of each test performed (Red/Amber/Green), and the overall result for each parameter.

The result of the QA will be an updated bottom-up stress test result that addresses concerns raised during the QA. In terms of the comprehensive assessment, these results are intermediate and serve as the starting point for the join-up, and should therefore be considered indicative/preliminary, as the join-up will both change starting points and evolution and potentially trigger further discussions between the ECB, the NCA and individual banks.

1.1 THE RED/AMBER/GREEN TESTS

This section details the set of minimum standard tests to be performed, the Red and Amber points for each test or combination of tests, and the standards of evidence required for non-adjustment of an Amber flag. The RAG tests cover the major risk types and other key elements of the stress test results, including:

1 credit risk;

2 market risk;

3 securitisations;

4 net interest income;

5 other pre-provision profit.

One of the key elements of the QA will be a comparison with the results of the ECB's top-down model, which has modules relating to each of the elements above.

1.2 CREDIT RISK

For credit losses, five types of test will be run:

1 comparison of starting point PD PIT and LGD PIT parameters with outcomes of AQR collective provisioning challenger model and other analysis of default flow;

2 parameter consistency within the bank;

3 comparison of bottom-up stress test results provided by the banks with the results of the top-down model owned by the ECB (and used for the creation of the ECB credit risk benchmarks);

4 comparison of bottom-up stress test results provided by the banks with the results of other banks within the same market;

5 comparison of bottom-up stress test results provided by the bank with the results of other banks across the SSM.

These tests can be considered to be a hierarchy and as such will be prioritised in the order above, from 1 to 5. Given this, if checks related to parameter consistency within the bank or related to comparisons with the ECB's top-down model, for example, raise significant issues during the QA, it may be the case that some additional checks (e.g. cross-market comparisons) are not performed, at the discretion of the ECB. For tests 4 and 5, priority will be given to those portfolios which have multiple Amber flags over those with only one Amber flag.

1.2.1 CREDIT RISK – PARAMETER CONSISTENCY WITHIN BANK

Starting EL will be compared with the 2013 unadjusted EI (for AQR portfolios) and the 2013 observed loss rate (for non-AQR portfolios) as measured by the impairment flow as a proportion of performing exposure during 2013 for each portfolio (it should be noted that the AQR unadjusted EI excludes one-off effects that are idiosyncratic to 2013).

Adverse case PD PIT and LGD PIT will be compared with both baseline PIT parameters and in the adverse scenario projected values will be compared with starting values.

Provision coverage rates on existing defaulted stock will be compared with the starting position, and with the loss rates for new defaults.

For IRB portfolios:

- Changes in PD REG are compared with changes in PD PIT.

- RWA under the adverse scenario will be compared with 2013 RWA and baseline RWA[2].

1.2.2 CREDIT RISK – BANK RESULTS VS. ECB TOP-DOWN MODEL

For this test, the ECB's credit risk parameters resulting from the top-down model – i.e. the ECB credit risk benchmarks provided to banks in the context of the EBA stress test – will be compared with the banks' forecast point-in-time parameters. The comparison will be conducted as follows:

At the level of each country portfolio (e.g. ECB credit risk projections for the Spanish corporate banking sector are compared with bottom-up credit risk projections forecast by each individual bank, including non-Spanish banks that have corporate exposures in Spain).

The model will take into account the starting default rate and loss rate to decide on the appropriate benchmark. As such, the comparison will be with the actual projected default rate and loss rates rather than the uplift multiples.

For LGD on new defaulted assets, a separate top-down model result is used for comparison. This will also utilise the starting-point-dependent benchmarks.

Portfolio thresholds will be applied based on the loss rate (e.g. PD*LGD) to determine Amber flags. In the event of an Amber result, the underlying PD and LGD comparisons will be made in order to understand the source of the divergence. However, in the event that, for example, a bank has a PD estimate over the benchmark and an LGD estimate under the benchmark such that the loss rate is in line with the benchmark, a Green flag will be returned (though, in extreme cases, NCAs or the ECB may also seek an explanation from the bank).

Only Amber flags are returned for this check – any result below the benchmark parameters will return an Amber flag which will then be investigated subject to the prioritisation procedure described above.

As the approach to the QA and the application of the benchmarks to banks with their own stress testing models creates the possibility of a level playing field issue with regard to standardised banks that apply the benchmarks straight, a follow-up test at the end of the QA process will consider whether an adjustment is needed for the standardised banks that have applied the benchmarks unadjusted (see Section 1.2). Any such adjustments will be made only after the conclusion of the QA on credit risk parameters within that market (i.e. likely during September).

[2] This applies only to accrual accounted assets. RWA on banking book assets accounted at fair value should also be checked, but are subject to the market risk methodology.

Any such adjustments will be communicated to the banks, with an opportunity for discussions with the banks at this point.

1.2.3 CREDIT RISK – BANK RESULTS VS. IN-MARKET COMPARISONS

For this test:

The definition of the portfolio to be tested is similar to that of the top-down model. However, two test comparison groups are considered:

- All banks with domestic exposures (e.g. the Spanish corporate exposures of all banks; Spanish or foreign).
- Domestic portfolios of domestic banks and foreign exposures of foreign banks (e.g. for Spanish banks the comparison is made with the Spanish corporate exposures of other Spanish banks; similarly for non-Spanish banks, the comparison is also made with the Spanish corporate exposures of other non-Spanish banks). This is done to adjust for any differences that may exist in the domestic exposures of domestic banks versus foreign banks.
- In both cases, only SSM banks in the stress test are considered for comparison.

The projected point-in-time loss rate will be compared with the loss rates in the rest of the market. In order to adjust for different starting points, this will be achieved by:

- Converting PD changes into changes in "Distance to default" space. The same approach is used in the ECB's top-down model to adjust for different starting points.
- Extracting the absolute change in LGD for other banks.
- Comparing the bank's EL to that which would apply based on market comparable PD and LGD changes in combination.

For the projected LGD PIT, the test compares the increase in the LGD PIT:

- This will look at the absolute increases in LGD, as percentage increases are highly sensitive to starting-point LGDs.
- For example, if bank A has an LGD that increases from 25% to 35%, this corresponds to an increase of 10%, to be benchmarked against other banks in-market for the same portfolio.

1.2.4 COMPARISON OF BANK LEVEL RESULTS WITH EUROPEAN AVERAGES

Bank-level loss rate results (defined as new impairment flow/last year's performing assets) will be collated across countries for the same asset class (e.g. mortgage PDs across all banks in all countries). Bank loss rate results will be compared against the loss rates of other banks in all markets based on a cross-market regression of the underlying parameters. In the event of an Amber result, a comparison of the underlying parameters will be made in order to understand the source of the divergence. The underlying parameters will be treated as follows in order to calculate the implied EL. As per the in-market comparisons, adjustments will be made to account for different starting points, with the changes in distance-to-default (DtD), changes in LGD and the ratio between loss rate and PD*LGD extracted and applied to a single set of starting parameters to create a like-for-like comparison.

1.2.5 VERIFICATION OF STRESS TEST PIT PARAMETERS VS. AQR COLLECTIVE PROVISIONING PARAMETERS

As part of the stress test QA, the bank's end-2013 point-in-time parameters should be compared with the AQR's collective provisioning parameters (prior to any AQR adjustments). The QA will first check the banks EL PIT (defined as the portfolio average PD PIT * LGD PIT) vs. the AQR's EI parameter, and in the event of an Amber flag (i.e. where EL is lower by a quantitative pre-defined threshold than AQR unadjusted EI), then the differences between PD PIT and AQR-unadjusted PI; and between LGD PIT and AQR-unadjusted LGI need to be investigated.

For the PD, under the EBA methodology, banks are asked to use a PD PIT estimate for calculating the default flow, based on approved IRB models, where these exist. This test will verify that result against the observed default rate (unadjusted PI) generated by the AQR – not including reclassifications into default identified through the credit file review process and excluding one-offs.

In cases where the bank's PD PIT is lower by a pre-defined quantitative threshold than the AQR-unadjusted 2013 PI, banks will be asked to provide compelling evidence to justify the appropriateness of the submitted PD PIT parameter. In cases where sufficient evidence is not provided, the PD PIT will be adjusted as part of the QA process (this will include dialogue with banks) and may be rebased to the AQR-unadjusted 2013 PI (excluding one-offs and reclassifications into default identified through the credit file review process). All subsequent checks (and the subsequent join-up) would then be based on this rebased result, where relevant.

The same process will be conducted for starting-point LGD – with the LGD PIT used by the bank compared with the (pre-adjustment) LGI parameters collected as part of the AQR

collective provisioning work. Where the LGD PIT is lower by a pre-defined quantitative threshold than the 2013 LGI, unless compelling evidence is provided by the bank showing the appropriateness of the LGD PIT parameter, adjustments will be made as part of the QA process.

Moreover, given that, in some countries, provisioning levels are set in a prescriptive way according to local accounting rules (e.g. coverage ratios are fixed for all banks according to the amount of time the customer has been in arrears), in these circumstances an AQR adjustment may be made to the year-end 2013 provisioning levels if the observed loss experience in 2013 indicates that the prescribed local accounting coverage ratios are currently not sufficiently high to meet ECB thresholds set for the purposes of the comprehensive assessment. However, an adjustment of this sort does not necessarily imply the bank's forward-looking projections are inappropriate, as it is often the case that banks will be projecting losses on an economic basis. As a result, forward-looking projections should be assessed in the QA without prejudice to the AQR findings in such circumstances.

The different RAG tests for credit risk items are presented in the table below.

Test group	Test	Amber	Red	Evidence required for non-adjustment of Amber
Parameter consistency checks	CR01: Starting EL[3] (defined as the product of PD PIT and LGD PIT)	For AQR portfolios: EL << AQR unadjusted EI[4] For non-AQR portfolios: EL << Observed loss rate for 2013		• Approval of the calibration approach used to ensure 100% Point-in-time calibration • Evidence that the starting parameters used have appropriately taken account of one-off effects and macroeconomic effects in a manner comparable to that used in the AQR challenger model
	CR02: Adverse PD PIT and LGD PIT during the adverse scenario	PD PIT or LGD PIT are lower at any point in the stress than in 2013		• Demonstration that the macroeconomic conditions in the adverse scenario are an improvement on the 2013 starting point • This requires either that the ECB's top down model produces falling PD or LGD for the country, or else that the bank is able to provide its own model that satisfies the criteria outlined below in the tests of the banks' result vs. the ECB model (as stated below, pragmatism will be used when applying the outlined standards of evidence to these models)
	CR03: Adverse PD PIT or LGD PIT compared	PD PIT or LGD PIT are at any point in the scenario		• Bank needs to demonstrate that there is a portfolio improvement effect that outweighs the new information effect (see Section 2.1

[3] In all cases, EL refers to the ratio of EL/Exposure. All tests are performed for each portfolio separately.

[4] AQR unadjusted EI excludes one-off effects that are idiosyncratic to 2013.

Test group	Test	Amber	Red	Evidence required for non-adjustment of Amber
	with baseline PD PIT and LGD PIT	lower in the adverse than in the baseline scenario		for an explanation of these)
	CR04: Loss rates on defaulted assets (demonstrates that an appropriate LGD stress has been applied to existing defaults and not only to new defaults)	LGD PIT for defaulted assets in year t of the adverse scenario/ LGD for existing defaulted assets in 2013 << LGD PIT for performing assets in year t of the adverse scenario/ LGD PIT for performing assets in 2013	LGD stress for old defaulted assets in 2014 / LGD for existing defaulted assets in 2013 is ≤ 1 (i.e. DPC as defined in the EBA methodology <1)	• Demonstration that stress effect has been partly captured by adjusting DPC • Demonstration of the cyclicality of existing defaulted assets. This could include: ▪ Demonstration that the level of collateralisation of such assets is considerably lower than for new defaults ▪ Demonstration that existing defaulted assets have already been provisioned on the assumption of a zero cure rate, thus reducing cyclicality of LGD ▪ In either case, it is expected that the LGD on existing defaulted assets would be higher than for new defaults
	CR05: ΔPD REG vs. ΔPD PIT	ΔPD REG << ΔPD PIT: • for corporate portfolios • for retail portfolios	PD REG under stress < PD REG (2013)	• Regulator-approved IRB models demonstrating cyclicality of PD model is lower than a pre-defined quantitative threshold
LTV and LGD for RE related portfolios (starting points)	CR06	LTV % > 120% and LGD PIT 2013 < 20%		• Explanation of why the LGD PIT is not covering all the likely losses in the portfolios
Top-down model	CR07: Loss rate delta to ECB benchmark (taking into account bank-specific starting level)	Two levels of Amber apply: 1. Below ECB benchmark result by a pre-defined quantitative threshold will result in an Amber subject to materiality prioritisation as per the introduction to this chapter 2. Below the ECB benchmark by a further pre-defined threshold reflecting model		Statistical evidence based on the bank's own default rate data. For this Amber to be accepted, pragmatism will be used and the following standards of evidence will be reviewed in light of results: • The bank must present the results of macroeconomic regression analysis for PD and either macroeconomic regression analysis or a parametric model for LGD • The data series must cover at least one full cycle and include the years up to 2013. • In cases where domestic data series which would be used for calibration are not appropriate (e.g. historic data are significantly less severe than the scenario), evidence should be provided that alternative (more appropriate) sources of economic history have also been used

Test group	Test	Amber	Red	Evidence required for non-adjustment of Amber
		uncertainty in the ECB benchmarks will result in a 'dark Amber' meaning this is viewed as 'material' and is prioritised		• Provide evidence of sufficiently strong statistical performance of the bank's internal PD and LGD models • Banks taking the parametric approach for LGD should separately demonstrate the effect on observed cure rates, collateral recoveries, the time to recover, stressed discount factors
	CR08: Absolute loss rate	Loss rate << ECB top-down model result calculated using AQR PI and LGI		As per separate tests above
In-market comparison (all tests apply both to the whole market and domestic/foreign only comparison; all PD tests performed on pit parameters and for IRB portfolios also on regulatory parameters)	CR09: EL relative change	Bottom quartile; or ΔLGD (bank) << ΔLGD (market)		• Demonstration of reduced sensitivity (of at least 25%) of the cyclicality of the bank's loss rate vs. the rest of the market covering a complete economic cycle • Demonstration that the historical data used for this analysis are reflective of the bank's current portfolio • Explanation of differences in the quality of the bank's portfolio or credit processes that could lead to such a difference in result
	CR10: PD relative change (considered only in the event of an Amber flag on the EL check)	Bottom quartile[5]; or -ΔDtD (bank) << -ΔDtD (market)		• Demonstration of reduced sensitivity (of at least 25%) of the cyclicality of the bank's default rate vs. the rest of the market covering a complete economic cycle • Demonstration that the historical data used for this analysis are reflective of the bank's current portfolio • Explanation of differences in the quality of the bank's portfolio or credit processes that could lead to such a difference in result
	CR11: LGD relative change (considered only in the event of an Amber flag on the EL check)	Bottom quartile; or ΔLGD (bank) << ΔLGD (market)		• Demonstration of reduced sensitivity of the cyclicality of the bank's LGD vs. the rest of the market covering a complete economic cycle of a pre-defined quantitative threshold • Demonstration that the historical data used for this analysis are reflective of the bank's current portfolio • Explanation of differences in the quality of the bank's portfolio or credit processes that could lead to such a difference in result

[5] In all cases where quartile comparisons are made, this is restricted only to markets of four or more banks. Bottom quartile is defined based on -ΔDtD.

Test group	Test	Amber	Red	Evidence required for non-adjustment of Amber
	CR12: LTV 2013	LTV 2013 bank << market LTV		• Explanation of why the LTV of the related portfolio is so much lower than the market average
Cross-market comparison	CR13: EL	Implied EL based on cross market regression >> Bank EL		• N/A – this test is used to triangulate other results and may be used in selective circumstances where such a comparison is useful. Amber on this alone will not result in an overall Amber, and banks will be required to disprove the other Amber result

Note: "<<"/">>" refers to lower/higher by a pre-defined quantitative threshold.

In view of the fact that the top-down model comparison may, in theory, result in banks with stress testing models being allowed to use parameters that are below the ECB's credit risk benchmark parameters, a mechanism is applied to ensure that there remains a level playing field between these banks and those that apply the ECB's benchmark parameters directly due to a lack of their own stress testing models. This will apply only when:

The result of the QA for banks with stress testing models is on average below the mean result of the ECB model.

The reasons for the change are due to systemic features rather than differences between the portfolios of banks with stress testing models and standardised portfolios in the market.

As there are reasonable grounds to suppose that banks with more sophisticated models may systematically have portfolios that are of superior quality to those of banks without sophisticated models, compelling rationale would need to be provided that the results from the banks with such models could be read across to other banks in the market. The ECB will be responsible for determining when such an adjustment should be made, in consultation with the NCA.

1.3 MARKET RISK[6]

The EBA methodology defines two alternative approaches for stressing market risk/trading losses for Held-for-Trading (HFT) positions in both scenarios (baseline and adverse) – a simplified approach and a comprehensive approach. All banks participating in the exercise are required to apply stressed market risk factors and haircuts to exposures held in HFT, Available-for-Sale (AFS) or Fair Value Option (FVO) portfolios.

[6] This section applies to all banks, including those excluded from AQR work block 8.

For the simplified approach for HFT positions, the EBA methodology is highly prescriptive as to how banks should derive both baseline and adverse scenario stress test results from recent net trading income results. The QA on such results is, therefore, limited to assuring that this methodology has been correctly applied (see MR01). NCAs should verify that the correct result has been given by the bank. If any of these tests indicate that the methodology has not been correctly applied, this will qualify as a Red flag and the results replaced with the NCA's own calculation.

For banks using the comprehensive approach for HFT positions, a "floor" is set in the EBA methodology at the result of the simplified approach – i.e. if the result of the comprehensive approach is lower than that of the simplified approach for a particular bank, the simplified approach will be applied, therefore ensuring a level playing field for all banks. However, banks for which the floor is active will be challenged on their comprehensive approach results. This challenge may lead to an upward revision of the comprehensive approach losses and possibly deactivate the floor.

Beyond this floor for HFT positions, the main test of the plausibility of the results for HFT positions will be based on the reported sensitivities and standalone Value at Risk (VaR) contributions per risk factor. The Amber thresholds will be calibrated on the basis of the cross-section of submissions by banks (see MR02).

For AFS and FVO positions, a range of Mark-to-Market (MtM) losses, per maturity bucket and position type will be calculated, based on a set of benchmarks (e.g. Index moves, corporate bonds). Amber flags will be calibrated for these ranges (see MR03).

For Credit Valuation Adjustment (CVA), the only QA that will be possible will be to ensure that the CVA stress test methodology has been carried out correctly – namely that the correct haircuts have been applied to the relevant MtM position. This is due to the fact that the CVA haircut provided by the EBA scenario is only applied to derivatives positions which are not with a Central Counterparty (CCP), and where no Credit Support Annex (CSA) exists, and therefore no comparison, for example, with International Financial Reporting Standards (IFRS) accounts is possible, nor is it possible to compare against the output of the CVA Challenger model from the AQR, as these are both applied to a broader set of counterparties. The approach to market risk is summarised in the table below:

Test	Amber	Red	Evidence required for non-adjustment of Amber
MR01. HFT positions: Comparison with simplified approach	N/A	Comprehensive approach is <100% Simplified approach	
MR02. All HFT positions (Comprehensive approach)	Comprehensive approach losses < Stand-alone VaR (applied at asset class level) Comprehensive approach losses < Sensitivity * Position (applied at major risk factor level)	N/A	Proof of different perimeter of VaR model vs HFT portfolio Evidence that the VaR shocks are significantly different from the scenario (direction, magnitude) Evidence that first-order local sensitivities do not capture substantial non-linearities in the trading book – i.e. that the sensitivity is not a good approximation of the stress impact
MR03. All cash positions in AFS and FVO	Comprehensive approach losses < benchmark value (applied at the level of maturity/issuer type)	N/A	Demonstration that the bank's portfolio is of higher credit quality or shorter maturity than the benchmark portfolio
MR04. CVA losses – ensure methodology has been applied correctly	N/A	EBA methodology not applied correctly	

In the event of an Amber result, the NCA should seek further evidence from the bank to support its submitted results – this should evidence the approved valuation models used, explain the positions in the portfolio and quantify any offsetting second or third-order effects to explain the result, or consider other factors such as the impact of diversification in the stress test versus the VaR model, or any difference between the positions included in the VaR model versus the HFT portfolio. In the event that the bank is not able to provide such supporting evidence, banks will be asked to resubmit their results.

In addition, QA tests should be conducted for market risk RWA elements, as specified below:

Test	Amber	Red	Evidence required for non-adjustment of Amber
MR05. VaR – EBA methodology test	N/A	EBA methodology not applied correctly	N/A
MR06. Incremental Risk Charge (IRC) – comparison with top-down model7	Bank IRC << Top-down model IRC	N/A	Evidence of a stress testing model developed for IRC that links the macroeconomic scenario to underlying credit exposures (in line with the requirements in the credit section) and reruns the bank's IRC calculations
MR07. IRC – cross market comparison	Increase in IRC below a pre-defined percentile of market peers		Evidence that IRC portfolio consists of higher quality credit exposures than peer portfolios, or that the approach taken by the bank is superior to peers
MR08. IRC – comparison with increase in total credit risk RWA	Increase in IRC substantially different from increase of RWA in STA and IRB portfolios	N/A	Evidence that IRC portfolio is substantially different to overall credit portfolio
MR09. CRM – EBA methodology test	N/A	EBA methodology not applied correctly	N/A
MR10. CVA VaR – comparison with top-down model CVA VaR[8]	Bank stressed CVA VaR << Top-down model stressed CVA VaR	N/A	Evidence of an approach to stress-testing CVA VaR that links macro factors to migrations, spread changes, increases in spread volatilities, and exposure changes in a way that better captures the bank's portfolio
MR11. CVA Capital under stress – comparison with CVA Capital pre-stress	Bank CVA Capital << CVA Stressed-VaR	N/A	Evidence that the scenario used for calibration of CVA stressed VaR is less severe than the adverse scenario and/or that the ratio between starting CVA VaR and CVA stressed-VaR is less than 3
MR12. CVA – cross market comparison	Increase in CVA capital charge below a pre-defined percentile of market peers		Evidence that CVA exposures are of higher credit quality than exposures of peer banks

Note: "<<"/">>" refers to lower/higher by a pre-defined quantitative threshold.

7 The ECB has developed a top-down model that calculates IRC based on the rating distribution of exposures, based on a Monte-Carlo simulation of a range of different portfolios.

8 The ECB has developed a top-down model that relies on stressed migration matrices and applies the spread shocks specified in the scenario to calculate an approximate CVA VaR for the adverse scenario. For Standardised banks, the CVA is calculated using the standardised formula, using the average maturity of the portfolio and assuming constant exposure at default in line with the static balance sheet assumption. This CVA VaR will be compared with the bank's projection of CVA VaR under stress.

1.4 SECURITISATIONS HELD IN THE BANKING BOOK

Securitisations subject to MtM valuation are stressed using the approach to market risk/trading losses described above, and included in the same QA process. Specifically, the detailed securitisation position information collected as part of the AQR on a sub-sample of banks has been used to populate a top-down model based on banks' sensitivities to the market risk shocks. For the avoidance of doubt, the prudential scope of consolidation should be binding under the stress test, provided that the CRR has been fully followed. This means that retained securitisation positions of an originator or sponsor (where the unretained tranches have been deconsolidated in accordance with the relevant paragraphs of the CRR) are included in the QA process.

For securitisation positions not held for trading, banks are required to estimate impairments under stress by stressing the underlying credit pool's credit and prepayment models consistent with the scenario. For the QA, banks' results will be tested against a top-down model developed by the ECB – this model employs scenario-dependent stressed migration matrices together with rating agencies' reported LGDs to estimate impairments for different categories of securitisation (Residential Mortgage-Backed Securities (RMBS), Commercial Mortgage-Backed Securities (CMBS), Asset-Backed Securities (ABS) and Structured credit split between Europe, the Middle East and Africa (EMEA) and North America).

For this test (see SN01), the bank's results will be considered Amber if the reported losses are less than a pre-defined quantitative threshold of the top-down model. In the event of an Amber result, banks should provide statistical evidence to support their results. This should include:

Use of approved impairment calculation models for securitisations.

Stress testing models for the underlying credit pool quality that:

1 link macroeconomic factors to credit losses in the underlying pool – such models should meet the same standards of evidence as required for models used for credit losses as described above.

2 link prepayment to macroeconomic factors – these models should be either regulator-approved models used for securitisation valuation or interest rate risk in the banking book (IRRBB), or provided by reputable external vendors (especially for US securitisations).

In the event that such evidence is not provided to the satisfaction of both the NCA and the ECB, Amber results may be replaced with the ECB top-down model result as part of the QA process. The detailed securitisation position information collected as part of the AQR mentioned above will also be used in this context for consistency checks.

For RWA on securitisations, the EBA prescribes revised risk weights to be used depending on three pre-defined risk buckets. The QA should test via the additional SSM stress test templates that this has been applied correctly – where it has not, this will qualify as a Red flag and should be corrected or replaced (see SN02).

In addition, the market cross-comparison checks (SN03 and SN04) should be made for the exposure corresponding to the credit quality steps "all other and unrated".

Test	Amber	Red	Standards of evidence required
SN01. Impairment flow for HtM portfolio - comparison with top-down model	Bank losses < Top-down model losses	N/A	Bank has employed stress testing models that link the scenario to securitization losses that meet the above defined standards of evidence (see paragraph above this table)
SN02. RWA - EBA revised risk weights methodology is applied correctly	N/A	Total RWA reported is inconsistent across templates	N/A
SN03. Ratio of 2013 adjustment/2013 exposure (for all other and unrated exposures, across all types of risk)	A pre-defined quantitative threshold [9]	N/A	Evidence that the quality of exposure in this rating bucket is better than peers, and has lower cyclicality than peers
SN04. percentage cumulative change end-2013-2016 in total adjustments (for all other and unrated exposures, across all types of risk)	A pre-defined quantitative threshold	N/A	Evidence that the quality of exposure in this rating bucket is better than peers, and has lower cyclicality than peers

1.5 NET INTEREST INCOME

QA of Net interest income (NII) will be tested with three types of checks:

- methodology and parameter consistency checks;
- comparison with the ECB's top-down model results;
- in-market cross-comparison checks.

These tests, associated Red/Amber/Green thresholds, and standards of statistical evidence for overturning an Amber result are shown below. In all material Amber cases, banks are requested to submit new evidence or results. In the event of a Red classification, the bank will be instructed what needs to be done to meet the Green classification and asked to submit new results. Pragmatism will be used in applying the outlined standards of evidence, and the ECB

[9] The relevant peer group is all banks with securitisation portfolios corresponding to the relevant asset classes.

may be open to reviewing the standards of evidence in light of bank responses in order to ensure a level playing field.

1.5.1 NET INTEREST INCOME – METHODOLOGY AND PARAMETER CONSISTENCY CHECKS

Test	Amber	Red	Standards of statistical evidence required
NII01. 2013 data consistency with reported figures (test to be performed by NCAs)	Any deviation		Externally audited revised 2013 figures
NII02. Static balance sheet	Static balance sheet methodology has not been correctly applied		Bank has an approved restructuring plan and has been granted a specific exemption from the static balance sheet assumption. In such cases, the bank should provide evidence that the restructuring plan has been correctly applied in the stress test
NII03. NII does not increase compared with end-2013 under either adverse or baseline scenario	Any increase		EITHER bank has an agreed restructuring plan where such an increase is specified, including a justification that it would remain under stress OR NII increase comes exclusively from discount unwind on defaulted assets and is shown to be sufficient to create an aggregate increase in NII
NII04. Interest accrual on NPE assets in the stress test under the adverse scenario	>0		Demonstration of current use of discount unwind methodology in existing accounting, including use of this methodology in published accounts Demonstration that NPE on defaulted assets is not more than that which could be expected as a result of this discount unwind approach consistent with the scenario
NII05. Pass-through of sovereign spread increase into funding costs according to paragraph 172 of the EBA methodology	<100% to wholesale funding <50% to corporate deposits <30% to household deposits		These tests are requirements of the EBA methodology. However, as it is not possible with 100% accuracy to determine whether they have been adhered to, based on the templates, it is necessary to infer the approach taken. In the event that this inference[10] suggests

[10] In the stress test templates submitted, new business rates are not explicitly specified – instead banks are asked to provide an effective rate on business that has been replaced since 2013. In the stress test template, maturity is defined in terms of reference interest rate re-pricing date. Furthermore, products with maturities below one year will distort the picture, and the full maturity profile of maturing assets is unknown (only the average starting maturity). Therefore, to infer the pass-through, the ECB will assume that items mature evenly through the year and that maturing loans and deposits are replaced with similar loans and deposits with the same starting maturity profile as the starting balance sheet. This should provide a good approximation, but not a perfect one.

Test	Amber	Red	Standards of statistical evidence required
			a deviation from the methodology, the bank will be asked to prove that the pass-throughs have been applied with reference to details of their balance sheet structure, repricing arrangements and maturity profiles. Where behavioural assumptions are relied upon, the bank should have statistical models to justify these assumptions (such as those used for IRRBB calculations)
NII06. Pass-through of funding costs to lending rates according to paragraph 173 of the EBA methodology	>75% of increase in funding costs applied (excl. mortgages) >50% of increase in funding costs applied to mortgages		As above
NII07. It is expected that the increased cost of funding would feature under the adverse scenario (paragraph 176 of the EBA methodology)		Cost of funding over the ST horizon under the adverse scenario < cost of funding at the beginning of the exercise	N/A
NII08. Rate on non-maturing fixed rate assets and liabilities	Any change		Either • Evidence of contractual ability of the bank to change the rate charged or paid to customers within the term of the contract, and • Statistical evidence showing that the bank has used this right in the past during times of stress covering at least the last five years and at least one year of GDP contraction Or • Evidence of a change in portfolio composition during the scenario as a result of defaults and/or maturing assets and liabilities that would systematically affect net interest income
NII09. Eurosystem funding (in accordance with paragraph 180 of the EBA methodology)		Any increase in Eurosystem funding	Restructuring plan that explicitly envisages an increase in Eurosystem funding during the scenario period
NII10. Deposit rate compared with wholesale funding rate	Deposit rate increase << wholesale funding increase distinguishing between: • Sovereign and Institutions		• Statistical evidence showing historical ability to increase deposit rates below increases in wholesale funding rate without losing market share • Historical period should cover market-wide (rather than idiosyncratic) stress events

Test	Amber	Red	Standards of statistical evidence required
	• Corporate • Retail		covering at least the last five years and at least one year of GDP contraction

Note: "<<"/">>" refers to lower/higher by a pre-defined quantitative threshold.

1.5.2 NET INTEREST INCOME – BANK RESULTS VS. IN MARKET COMPARISONS

All tests outlined below should be made with reference to portfolios – e.g. the comparison for German mortgages will include all German mortgage portfolios, including those of non-German banks.

Test	Amber	Red	Standards of statistical evidence required
NII11. Lending rate increase (applied for each portfolio; comparison made to both all banks in that portfolio and to only the domestic/foreign banks as per the credit risk section)	Bank-specific lending rate increase >> market average rate increase distinguishing between: • Institutions and sovereigns • Corporate lending (including CRE) • Retail		• Statistical evidence showing historical ability to increase loan rates beyond competitors without losing market share beyond X (as defined in the Red and Amber tests) • Historical period should cover market-wide (as opposed to idiosyncratic) stress events covering at least the last five years and at least one year of GDP contraction
NII12. Deposit rate increase	Bank-specific rate increase << market average rate increase distinguishing between: • Institutions and sovereigns • Corporate lending (including CRE) • Retail		• Statistical evidence showing historical ability to increase deposit rates less than competitors without losing market share beyond X (as defined in the Red and Amber tests) • Historical period should cover market-wide (rather than idiosyncratic) stress events covering at least the last five years and at least one year of GDP contraction

Note: "<<"/">>" refers to lower/higher by a pre-defined quantitative threshold.

1.5.3 NET INTEREST INCOME – BANK RESULTS VS. ECB'S TOP-DOWN MODEL

The ECB has a top-down model that stresses net interest income based on a projection of the bank's static balance sheet given the maturity profile provided in the templates and a series of regression models that link macroeconomic factors to front-book loan and deposit rates in

different countries. For the purposes of the QA, bank-produced NII results will be compared with the results of this model as shown below:

Test	Amber	Red	Standards of statistical evidence required
NII13. NII comparison at both a total and major line item level (e.g. wholesale funding)	Bank-specific NII >> top-down model NII distinguishing between total and major line items		• Use of an asset-liability model (ALM) model to project forward NII that is either the same as the ALM model used for Pillar II interest rate risk as reviewed by the NCA, or that has been specifically developed for the purposes of stress testing, and that incorporates: ▪ The duration and maturity profile of the bank's balance sheet to capture the effect of interest rate movements on NII ▪ the whole of the bank's interest-bearing balance sheet ▪ behavioural assumptions for maturity of products, including links between customer behaviour (e.g. prepayment on mortgages) and macroeconomic factors ▪ the impact of defaults on NII ▪ the impact of the scenario on front-book pricing for both loans and deposits consistent with the EBA methodology ▪ a consistent static balance sheet assumption ▪ stress applied to both the reference rate and the spread charged or paid by the bank to customers ▪ differences in the maturity profile of spread re-pricing vs. interest rate re-pricing
NII14. Central bank rate increase	Bank-specific rate increase << top-down model		• N/A
NII15. Front-book loan rate increase (applied for each portfolio)	Bank-specific rate increase >> top-down model		• Statistical evidence showing the relationship between macroeconomic parameters and the bank's own lending spreads • Historical period should cover market-wide (rather than idiosyncratic) stress events covering at least the last five years and at least one year of GDP contraction • Regression must satisfy all the statistical tests specified in the credit risk section
NII16. Deposit rate increase	Bank-specific rate increase << top-down model		• Statistical evidence showing the relationship between macroeconomic parameters and the bank's own deposit rates • Historical period should cover market-wide (rather than idiosyncratic) stress events covering at least the last five years and at least one year of GDP contraction • Regression must satisfy all the statistical tests specified in the credit risk section

Note: "<<"/">>" refers to lower/higher by a pre-defined quantitative threshold.

1.6 OTHER PRE-PROVISION PROFIT AND CAPITAL PLANS

Other pre-provision profit items can be projected in the EBA methodology, either using bank-defined methodology or on the basis of conservative recent historical ratios. For the purposes of the QA, two tests are envisaged:

1 consistency checks with EBA methodology;

2 in-market cross-comparisons;

1.6.1 OTHER PRE-PROVISION PROFIT AND CAPITAL PLANS – METHODOLOGY CONSISTENCY CHECKS

Test	Amber	Red	Standards of statistical evidence required
PPP01. Increase in non-interest income vs. 2013	N/A	Any increase	• N/A
PPP02. Application of recent ratios	Non-II is above EBA methodology result	N/A	• Bank has documented in its narrative note the methodology it has used for non-interest income lines • Statistical or contractual evidence provided supporting the bank's own estimates of non-II line items. Where statistical evidence is used this should cover at least five years and meet the same statistical standards as specified for credit risk and NII
PPP03. Other administrative and other operating expenses		Below 2013 level	• Restructuring plans that explicitly envisage a decrease in administrative and other operating expenses in the stress test horizon
PPP04. Prudential AFS filter on regulatory capital phase-out		Prudential AFS filter on regulatory capital phase-out transition not applied	• N/A
PPP05. Deferred tax assets		DTAs applied above maximum acceptable bound	• N/A
PPP06. Callable capital items		Capital items not called at the first call date	• N/A

1.6.2 OTHER PRE-PROVISION PROFIT AND CAPITAL RESULTS BANK RESULTS VS. IN-MARKET COMPARISONS

For these tests, the market is defined as the SSM banks operating in the same market (e.g. a French bank will be compared with other French banks in the SSM).

Test	Amber	Red	Standards of statistical evidence required
PPP07. Income items (applied to each line item individually)	percentage decrease in income item (bank) << percentage decrease in income item (market average)		• Bank can provide evidence business model differences to competitors and statistical evidence of the reduced cyclicality of the elements of its business model that create this result • Statistical evidence should provide at least five years of data including at least one year of GDP contraction
PPP08. Expense items (applied to each line item individually)	percentage increase in expense item (bank) << percentage increase in expense item (market average)		• Bank can provide evidence of business model differences to competitors and statistical evidence of the reduced cyclicality of the elements of its business model that create this result • Statistical evidence should provide at least five years of data including at least one year of GDP contraction

Note: "<<"/">>" refers to lower/higher by a pre-defined quantitative threshold.

1.7 APPROACH FOR BANKS WITH APPROVED RESTRUCTURING PLANS

The QA will be performed on all banks, including those with approved restructuring plans. However, as banks with restructuring plans have a (restricted) exemption from the static balance sheet assumption, some of the QA tests need to be rebased to reflect this difference. This will apply to:

- the aggregate-level comparison with the top-down model for NII and Non-II;
- the static balance sheet test;
- the Eurosystem funding test;
- non-II tests of DTAs, callable capital items and the increase in individual Non-II items (reduction in expense items).

In addition, for these banks, a further test will be applied that checks that the price obtained for any disposed assets is lower under the adverse scenario than under the baseline scenario. Moreover, it will be checked that Profit and Loss (P&L) account results under the adverse scenario are lower (higher for expense items) compared with the baseline scenario.

2 JOIN-UP

2.1 ACCRUAL ACCOUNTED CREDIT RISK JOIN-UP

The approach for all banks with respect to the join-up for accrual accounted assets is to ensure that the stress test results are properly informed by the AQR findings, thereby ensuring confidence in the robustness of the final results of the comprehensive assessment. The bank's projections of credit losses from its accrual accounted portfolios are thus affected by the findings of the AQR where these are material.

The findings of the AQR provide a number of adjustments to year-end 2013 balance sheet results. Any changes identified in the AQR can be applied directly to the starting point balance sheet. In addition, the AQR provides new information on the way a bank classifies and measures credit risk, along with some of the underlying assumptions that drive the results. The aim of the accrual accounted credit risk join-up is to ensure that this information is included in a bank's stress test results.

The critical assumption underlying the approach to the join-up for accrual accounted credit portfolios is that findings from the 2013 AQR analysis should, if considered material, lead to adjustments in forward-looking projections over the stress test horizon. In cases where the AQR finds that credit losses have not been correctly measured in historical terms, the projections should be checked to establish whether they have been drawn up appropriately.

Where possible, the results of the AQR are given to the banks for incorporation into the bank-led exercise; see Chapter 2.3 for more details.

Substantial bottom-up information has been obtained through the AQR regarding the credit measurement of a bank; this information will support the join-up. The results show on a granular basis the impact of AQR findings on specific credit measures, more specifically:

- The PI parameter is derived in the AQR based on the observed flow from performing to non-performing exposures during 2013 (with non-performing exposures (NPE) defined according to the EBA simplified approach). The PI is adjusted for one-off NPE reclassifications that occurred during 2013, and goes through QA with the bank and the NCA. It is also explicitly adjusted on a "bottom-up" basis for any AQR reclassifications that have been made, and thus accounts directly for the result of transfers on the quality of the underlying portfolio.

- The LGI parameter is derived in the AQR based on the observed coverage ratio for non-performing exposures. As per the PI parameter, the LGI for performing exposures is

adjusted for portfolio composition on a "bottom up" basis after AQR reclassifications.[11]

- The PI parameter is analogous to the 2013 PD PIT parameter used in the stress test (it should be noted that this is different to the 2013 PD REG parameter) and the LGI parameter for performing exposures is analogous to LGD PIT and LGD PIT-old in the EBA template. It is recognised that these parameters may diverge, and thus no direct mechanistic comparison between them is performed.

- The PI and LGI parameters from the AQR are calculated on a completely "bottom-up" basis (i.e. using detailed data) as they are derived from granular analysis of loan tape data, but they are "centrally-led" as they are calculated as part of the AQR. The experience of collating loan tape data in the AQR is that in many instances the AQR exercise has access to substantially more granular data than the "bottom up" analysis that the banks themselves will have performed when conducting the stress test.

Adjustments to PI and LGI parameters from the AQR cannot be ignored during the join-up process. Where there are material differences between adjusted and unadjusted results, this must be reflected in the bank's stress test parameters to ensure that they are appropriately conservative and potentially further investigated by NCAs and the ECB. This assessment will draw on qualitative findings from the AQR and discussions with the banks during the QA. It should be noted that as part of the stress test QA the appropriateness of PD PIT parameters will be checked (e.g. ensuring that these are exposure-weighted not obligor-weighted), such that any join-up comparisons will not confuse "pure" stress test results with new information from the AQR.

Reclassification from "performing" to "non-performing" has two offsetting effects on the PI and the LGI of the remaining performing portfolio:

- Portfolio improvement effect (PIE): Loans re-classified as NPE are most likely to have been from the lower credit quality part of the performing portfolio. As a result of the re-classification, the remaining portfolio may be of higher quality.

- New information effect (NIE): The re-classification of loans provides new information on the bank's ability to correctly measure defaults. This new information suggests that the default rates the bank has observed historically and used as an input to calculate PD measures were inappropriate.

- PIE and NIE are opposing effects, and depending on the composition of the portfolio and a number of other factors, will offset one another to differing degrees. The quantification of this is undertaken on a granular basis as the PIE and NIE effect are

[11] Note, for some portfolios LGI is defined as: (1-cure rate) * Loss Given Loss (LGL)

taken into account directly and the final adjusted AQR parameters give the net result of these two effects.

The join-up adjustment to future parameters will in all cases include reducing the amount of performing exposure by the amount of exposure reclassified to NPE as a result of the AQR.

In cases where there is a material difference in EL projections (compared to a pre-defined quantitative threshold) as a result of applying new AQR information, the following adjustments will be made to the PD PIT and the LGD PIT NEW parameters (note that changes to these parameters can be both positive and negative):

- The bank's post-QA PD PIT parameters will be adjusted by applying an additive shift in distance-to-default space that reflects the difference between the AQR-adjusted and unadjusted PI.
- The bank's post-QA LGD PIT NEW will be shifted by the absolute difference between the AQR-adjusted and unadjusted LGI.
- The above effects will be translated into a revised projection of loss in each year.
- In cases where a bank's post-QA PD PIT or LGD PIT NEW is higher than the AQR-adjusted PI or LGI, there will not be an adjustment to the PD PIT or the LGD PIT NEW.
- In cases where a bank's post-QA PD PIT or LGD PIT NEW is higher than the AQR unadjusted PI or LGI, then the PD PIT or LGD PIT NEW following the join-up should not increase above the AQR-adjusted PI or LGI.
- In a situation where the unadjusted PI is zero, the PD PIT will be set to the maximum of either the PD PIT or the adjusted PI.

The join-up is performed at the most granular portfolio level available with AQR and stress test information, with adjustments made for the misalignment between these.

2.1.1 STRESS TEST QA PRIOR TO JOIN-UP (RECAP)

An important element of the stress test QA will be an assessment of banks' starting-point parameters (i.e. their PD PIT and LGD PIT). This will include, among other checks, a comparison with AQR-unadjusted PI and LGI parameters (i.e. prior to these having been adjusted for the impact of any AQR findings). Discussions will take place with the banks as part of the stress test QA on the relationship between PD PIT vs. AQR-unadjusted PI and LGD PIT vs. AQR unadjusted LGI, but there will be no "mechanistic" adjustments. Quality-assured PD

PIT and LGD PIT parameters will be agreed without reference to reclassifications to NPE or changes in provision coverage identified in the AQR. This will be the starting point for the subsequent join-up with the AQR findings.

Further to this, some elements of the join-up with the AQR will take place on a bank-led basis as part of the QA process:

1 Changes in AQR asset segment identified in the credit file review

2 Changes in regulatory exposure class

3 Identification of future losses

These are described in more detail in the following sub-sections.

Changes in AQR asset segments identified in the credit file review

The AQR exercise will identify credit exposures that have been incorrectly classified in terms of their AQR asset segment, for example, a portfolio might need to be re-classified from small and medium-sized enterprises (SME) loans to commercial real estate (CRE) loans. Asset re-classifications identified as part of the DIV exercise will be incorporated into the stress test by the banks themselves to ensure that macroeconomic sensitivities in the stress test are applied appropriately. This is described in Section 2.3.3.

For the avoidance of doubt, the correction of asset segment misclassifications should have no direct impact on the December 2013 available capital. Furthermore, as changes to accounting metrics will not be communicated to banks this is expected to have no consequences for market disclosure by the banks.

The AQR credit file review will also identify credit exposures with similar asset segment re-classification issues. The misclassifications to consider are re-classifications to:

- any segment that should be reclassified as real estate related;
- any segment that should be reclassified as shipping or aviation;
- any segment that should be reclassified as retail mortgage.

If the bank differentiates parameters between owner occupier and buy-to-let mortgages, this should also be considered.

Where it was not possible to communicate asset segmentation re-classifications to banks in the time available before the submissions of the bottom-up stress test results to NCAs and ECB,

then additional material re-classifications will be considered during the QA of the bank's stress test results. Where it is concluded that additional centrally-led adjustments are required in order for stress test results to accurately reflect such additional re-classifications, these will be reflected in the QA findings.

Changes in regulatory exposure classes

For regulatory capital requirements purposes, exposures are assigned to categories such as institutions, corporate, retail, etc. As part of the AQR credit file review, NCA teams will review the adequacy of regulatory exposure classes for credit exposures and will identify instances where re-classifications are required.

Material re-classifications will be considered during the QA of the bank's stress test results. Where it is concluded that additional centrally-led adjustments are required in order for stress test results to accurately reflect such re-classifications, these will be reflected in the QA findings.

Identification of future losses

The AQR may identify cases where exposures are not currently considered impaired but are very likely to be in the near future. These future losses are identified and noted but are not included in the AQR-adjusted CET1 ratio, nor are they produced in time to be shared with banks and factored into the bank-led stress test results. However, in selected cases, they may be a material driver of future losses and should be captured in the ECB's comprehensive assessment.

In order to ensure that future losses identified in the AQR are included in the stress test but not double-counted, NCAs and the ECB will consider the impact as part of the stress test QA. Where it is concluded that such losses have not been adequately included, this will be reflected in the QA findings.

2.1.2 AQR PARAMETERS AND HOW THEY ARE DERIVED

The AQR will calculate both *unadjusted* and *adjusted* PI and LGI parameters. Unadjusted parameters are prior to any AQR findings (e.g. NPE re-classifications and changes to coverage ratios) and are calibrated as part of the AQR QA; adjusted parameters take into account AQR findings. Unadjusted AQR parameters will be used as part of the QA process for banks'

starting-point parameters; the difference between adjusted and unadjusted AQR parameters will be used as part of the join-up in order to quantify the impact of AQR findings.

As part of the AQR, NCA bank teams have carried out detailed analysis of the appropriate PI and LGI parameters following a standardised methodology to create a "collective provisioning challenger model". While no direct and mechanistic comparison between PD PIT and PI or LGD PIT and LGI is made, the PI and LGI parameters are analogous to PD PIT and LGD PIT in the EBA methodology:

PD PIT 2013 reflects the point-in-time default rate for 2013 as does the PI. This is based on the assumption that the banks use the EBA simplified approach for the default definition, as they have been instructed to do by the ECB.

LGD new 2013 in the EBA methodology reflects the point in time LGD for new exposures flowing into default. LGI for performing exposures reflects the loss given impairment applied to performing exposures in the IBNR calculations[12] as at December 2013.

It should be noted that as part of the AQR QA process, both the PI and the LGI will be discussed with the banks, which will have an opportunity to challenge these parameters as part of this AQR QA.

Further detail on the AQR PI and LGI is provided in the sub-sections below.

Probability of Impairment

The probability of impairment (PI) parameter is derived in the AQR based on the observed flow from performing to non-performing exposures during 2013 (with NPE defined according to the EBA simplified approach). This observed default rate is calculated for each sub-segment within a portfolio (where sub-segment is defined in a granular manner, specific to each AQR segment), with the PI for the total portfolio being calculated as the exposure-weighted average of the underlying segments.

The PI parameter is analogous to the 2013 PD PIT parameter used in the stress test, not the 2013 PD REG parameter. As per the EBA methodology, PD PIT parameters used for forecasting losses should be exposure-weighted (as opposed to obligor-weighted); as such the AQR PI is similar to the 2013 PD PIT (see paragraph 71 of the EBA methodological note). The EBA simplified approach NPE definition is analogous to the Basel PD definition – the Basel PD definition is 90 days past-due plus unlikely to repay. The EBA simplified approach is 90 days past-due, plus unlikely to repay and also impaired. Given that all impaired cases should be

[12] Where macro-economic assumptions are relevant for setting LGI, the EBA baseline scenario is applied explicitly.

viewed as unlikely to repay, they are to all intents and purposes the same (with some potential for slight divergence around exit criteria relating to forbearance). It should also be noted that the default definition used in the calculation of the PI is based on national materiality thresholds for default, and as such is in line with the Basel PD definition.

The PI methodology makes allowance for potential concerns related to the extrapolation of strata with small samples. Nevertheless, it is necessary to ensure that the safeguards included in the PI methodology have been appropriately applied and the extrapolation of results is reliable. Cure rates also need to be adjusted for credit file review findings as per AQR circular 22. The AQR PI also takes into account any one-off events such as default reclassifications and macroeconomic conditions in 2013. The PI is defined based on a "within 12 months" definition of default (i.e. has the customer defaulted within the last 12 months) in line with the CRR.

The AQR will calculate both an "unadjusted" PI and an "adjusted" PI, i.e. both before and after any AQR findings such as reclassifications from performing to non-performing. The "unadjusted" PI will be used as a comparison point for bank PD PIT in the QA, while the difference between "adjusted" and "unadjusted" PI will inform the join-up.

The AQR segmentation used for PI calculation is partially prescribed, but guidance is given to NCAs about how different segments could be defined or how segments can be merged (if data is unavailable). The segmentation varies between AQR portfolios:

Table 1 Product-based segmentation

AQR asset segment	Product segmentation
Residential real estate (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 2	Loan-to-value (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 3	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

Table 4	Risk-based segmentation
AQR asset segment	**Risk-based segmentation**
RRE	High risk, high risk cured, normal cured, normal (see sampling methodology)
Other retail (excl. other secured loans)	High risk, high risk cured, normal cured, normal (see sampling methodology)
Other secured loans (retail)	High risk, high risk cured, normal cured, normal (see sampling methodology)
Retail SME	High risk, high risk cured, normal cured, normal (see sampling methodology)
Corporate (large and SME) and project finance	High risk, high risk cured, normal cured, normal (see sampling methodology) and internal rating
Shipping, aviation, CRE	High risk, high risk cured, normal cured, normal (see sampling methodology)

Additionally, non-retail exposure should be segmented by internal rating. Sub-segments with immaterial exposure or where the segment cannot be defined need not be separately analysed but can be grouped with the most appropriate other sub-segment.

Once the observed default rate is determined and verified, it is adjusted based on the relevant AQR findings to arrive at the PI parameter. This is achieved by adjusting the numerator and

denominator of the observed default rate calculation for the volume of misclassifications: volumes of misclassifications that should have been classified as defaults prior to 2013 are removed from the denominator of the observed default rate calculation, whereas other misclassification volumes are added to the numerator.

Reclassification from performing to non-performing has two offsetting effects on the PI of the remaining portfolio:

- Portfolio improvement effect (PIE): Loans re-classified as NPE are most likely to have been from the lower credit quality part of the performing portfolio. As a result of the re-classification, the remaining portfolio may be of higher quality

- New information effect (NIE): The re-classification of loans provides new information on the bank's ability to correctly measure defaults. This new information suggests that the default rates the bank has observed historically and used to calculate PD measures were inappropriate

PIE and NIE are opposing effects, and depending on the composition of the portfolio and a number of other factors, will offset one another to differing degrees. The quantification of this is undertaken on a granular basis as such the PIE and NIE effects are taken into account directly in the PI calculation (i.e. the PI gives the net of the two effects). Please refer to AQR Circular 22 for more details.[13] In addition, when this adjustment is calculated, the following categories of additional NPEs should be excluded entirely in order to avoid a bias to the collective provisioning parameters:

- NPEs which are loans disbursed during 2013

- NPEs which are loans which have already been flagged as NPE within 2013 but were considered cured and were originally registered as performing at the end of 2013

[13] Calculation of the adjusted AQR PI for 2013 should take into account whether or not reclassifications to NPE occurred in 2013 or prior to this. The extent to which NPEs discovered in the AQR can be identified as 2013 could potentially vary across countries, as such this will be considered in the AQR QA.

An example of the calculation is shown below.

Figure 1 Adjusting AQR PI to account for AQR findings

Rating	Unadjusted AQR PI (observed default rate)	Unadjusted AQR PI (observed default rate) by risk class	AQR findings: % reduction in exposure due to reclassification	AQR findings: % of reclassifications where NPE event occurred during 2013	Adjusted AQR PI (observed default rate) by risk class	Adjusted AQR PI (observed default rate)
BBB+ and above	0.43%					0.43%
BBB	1.50%					1.50%
BBB-	1.99%	2.85%	0%	N/A	2.85%	1.99%
BB	4.48%					4.48%
B	10.59%					10.59%
Previous default	25.33%	25.33%	10%	50%	30.19%	30.19%
Watch list (not previously defaulted)	18.62%	18.62%	20%	50%	29.13%	29.13%
Watch list and previous default	26.01%	26.01%	50%	50%	54.61%	54.61%

Worked example for "Watch list and previous default" row

The unadjusted AQR PI (observed default rate) is 26.01% or 26.01 / 100, i.e. equivalent to defaults of 26.01 in 2013 out of a starting stock of 100

Given we are considering reclassifications, the performing exposure from which the reclassifications would come from can be considered to be 100 – 26.01 = 73.99

Reclassifications from 2013 are added to the numerator for the default rate, and reclassifications from previous years are removed from the denominator:

Numerator:
26.01 + (50% * 50% * 73.99) = 44.51

Denominator:
100 – (50% * 50% * 73.99) = 81.50

The adjusted AQR PI (observed default rate) is therefore 54.61%

(44.51 / 81.50 = 54.61%)

In the example above, the unadjusted AQR PI is provided by rating grade and by risk class; these are equivalent to one another (the rate by risk class is the exposure weighted default rate for the underlying rating grades). AQR adjustments are then applied to these default rates by risk class; the adjusted default rates can then be converted back to rates by rating grade.

The AQR findings identify the proportion of performing exposures to be reclassified as non-performing (the first of the "AQR findings" columns) and of these the proportion that should have been registered as non-performing in 2013 (the second of the "AQR findings" columns). The PI is then re-calculated by adding misclassifications from 2013 to the numerator and the default rate and misclassifications from previous years to the denominator. For example, for the "Watchlist and previous default" row above:

50% of total performing exposure was identified as needing to be reclassified as non-performing, of which 50% should have been registered as non-performing in 2013 (i.e. 25% of performing exposure) and 50% should have been registered as non-performing prior to 2013 (i.e. 25% of performing exposure).

Assuming a base of exposure of 100:

- Reclassifications that should have been registered as non-performing in 2013 (25% * 73.99 = 18.50) are added to the numerator as follows: 26.01 + 18.50 = 44.51

- Reclassifications that should have been registered as non-performing in previous years (25% * 73.99 = 18.50) are removed from the denominator as follows: 100 – 18.50 = 81.50

- The adjusted PI is therefore 54.61% (44.51 / 81.50 = 54.61%).

Given that both the PI and the performing exposure for 2013 will have changed following the reclassification, the average PI for the portfolio will also change. When the adjusted average portfolio PI is calculated we find that the NIE is offset by the PIE to some extent. The example below shows the impact on the portfolio-level default rate of the re-classifications shown in the previous example.

Figure 2 Determining portfolio average AQR adjusted PI

Rating class	Exposure (pre-adjustment)	Unadjusted AQR PI (observed default rate)	% reduction in exposure due to reclassification	Exposure (post-adjustment)	Adjusted AQR PI (observed default rate)
A	10,000,000	0.43%	0%	10,000,000	0.43%
A-	10,000,000	0.43%	0%	10,000,000	0.43%
BBB+	10,000,000	0.43%	0%	10,000,000	0.43%
BBB	10,000,000	1.50%	0%	10,000,000	1.50%
BBB-	10,000,000	1.99%	0%	10,000,000	1.99%
BB	10,000,000	4.48%	0%	10,000,000	4.48%
B	10,000,000	10.59%	0%	10,000,000	10.59%
Previous default	10,000,000	25.33%	10%	9,000,000	30.19%
Watch list (not previously defaulted)	10,000,000	18.62%	20%	8,000,000	29.13%
Watch list and previous default	10,000,000	26.01%	50%	5,000,000	54.61%
Total	**100,000,000**			**92,000,000**	
AQR PI (pre-adjustment exposures)		**8.98%**			**13.38%**
AQR PI (post-adjustment exposures)		**7.67%**			**10.61%**

Calculated as weighted average of Exposure (pre-adjustment and Unadjusted AQR PI

Calculated as weighted average of Exposure (pre-adjustment) and Adjusted AQR PI

Calculated as weighted average of Exposure (post-adjustment) and Unadjusted AQR PI

Calculated as weighted average of Exposure (post-adjustment) and Adjusted AQR PI

Following on from the previous example, we begin with a portfolio prior to AQR, and then an AQR identifies reclassifications to default. When the PI is recalculated (without adjusting observed default rates for individual rating classes) the average PI for the portfolio is reduced (from 8.98% to 7.67%) as illustrated above because the highest risk exposure has been reduced in importance relative to the lower risk exposure. However, this conclusion would be erroneous because part of the effect of the misclassifications on the portfolio quality has been ignored.

The impact of portfolio misclassifications on the calculation of the observed default rate therefore needs to be considered. Additional defaults that occurred during 2013 need to be added to the numerator of the observed default rate calculation for 2013, and additional defaults that occurred before 2013 need to be deducted from the denominator.

The figure above shows the impact on both the exposure and the AQR PI for the portfolio pre- and post-AQR reclassifications. Prior to any reclassifications the overall unadjusted AQR PI for the portfolio is 8.98%. The AQR reclassifications result in both a reduction in exposure (predominantly in the worst rating grades), shown in the column "Exposure (post-adjustment)", and an increase in PI for those rating grades where reclassifications occurred, shown in the column "Adjusted AQR PI (observed default rate)". Following these changes, the weighted average AQR PI for the portfolio changes to 10.61% (based on both the new exposure and PIs by rating grade). Therefore, the portfolio PI has actually increased, and the PIE has been more than offset by the NIE.

It is possible to create a portfolio where the PIE dominates the NIE. An example would be a "barbell" portfolio, with only the extremes of high and low credit quality exposures. This is illustrated in the diagram below, where the PI would be reduced from 13.2% to 8.5%.

Figure 3 Determining AQR adjusted observed default rate for "bar bell" portfolio

Rating class	Exposure (pre-adjustment)	Unadjusted AQR PI (observed default rate)	% reduction in exposure due to reclassification	Exposure (post-adjustment)	Adjusted AQR PI (observed default rate)
A	10,000,000	0.43%	0%	10,000,000	0.43%
Watch list and previous default	10,000,000	26.01%	90%	1,000,000	88.91%
Total	20,000,000			11,000,000	
AQR PI (pre-adjustment exposures)		13.22%			44.67%
AQR PI (post-adjustment exposures)		2.76%			8.47%

Calculated as weighted average of Exposure (pre-adjustment and Unadjusted AQR PI

Calculated as weighted average of Exposure (post-adjustment) and Unadjusted AQR PI

Calculated as weighted average of Exposure (pre-adjustment) and Adjusted AQR PI

Calculated as weighted average of Exposure (post-adjustment) and Adjusted AQR PI

In practice, across a whole bank this is highly unlikely for a bank with material credit portfolios in scope for the AQR. However, should this occur for specific portfolios the calculation of adjusted AQR PI will reflect the issue.

For all cases where the AQR identified differences that are material, there needs to be consideration to adjusting the bank's flow projections, or there is a risk of underestimating the projected specific impairment losses. To determine the materiality of the differences, the ECB and NCAs will make use of provisioning parameters derived in the AQR for each relevant portfolio. This is described in later sections.

LGI

The LGI calculation varies between retail and corporate; please refer to the AQR manual for details of the calculation approach for each of these.[14]

The LGI parameter may be adjusted directly as a result of the AQR; please refer to the AQR manual for a description of how this calculation is performed. As a separate effect, the average LGI may change as a result of the reclassifications of performing to non-performing, as lower credit quality exposures are likely to have a higher LGI. This is the "LGI portfolio improvement effect".

Whereas average PI parameters are exposure-weighted, average LGI parameters are PI and exposure-weighted. This is because there is a correlation between the LGI and the PI, and therefore the average LGI of a defaulted exposure will be higher than of a performing exposure.

The LGI calculation captures the LGI portfolio improvement effect from exposure reclassifications. However, the portfolio improvement effects in the LGI are relatively limited as can be seen from the example below based on a performing corporate portfolio (average PI and EAD are shown given the need to weight by PI and exposure):

Figure 4 Illustrative example of LGI calculation

For simplicity, Adjusted LGI has been kept the same (i.e. assuming no AQR findings related to coverage ratio). In reality this could increase but has been kept constant to demonstrate just the Portfolio Improvement Effect

Segment	Unadjusted AQR PI	Unadjusted EAD	Unadjusted AQR LGI	Adjusted AQR PI	Adjusted EAD	Adjusted AQR LGI
Secured0-60%	5.00%	100	10.16%	5.05%	99	10.16%
Secured60-80%	6.00%	100	19.73%	6.06%	99	19.73%
Secured80-100%	7.00%	100	39.96%	7.07%	99	39.96%
Secured100-150%	8.00%	100	58.08%	8.16%	98	58.08%
Secured150-200%	9.00%	100	69.73%	9.28%	97	69.73%
Secured200%+	10.00%	100	86.78%	10.53%	80	86.78%
Unsecured	11.00%	100	81.53%	12.22%	70	81.53%
Average LGI (unadjusted performing portfolio)						59.03%
Average LGI (adjusted performing portfolio)						57.13%

Calculated as weighted average of Exposure (pre-adjustment) and observed default rate adjusted

Calculated as weighted average of Exposure (post-adjustment) and observed default rate (adjusted)

In the example above, re-classifications occur which reduce the EAD, in particular for those buckets with higher PD. The LGI per rating bucket *remains the same* before and after this adjustment; however the average LGI changes as a result of correlation between the PI and the

[14] See Sections 7.7 and 7.8, Asset Quality Review Phase 2 Manual (dated March 2014).

LGI. It should be noted that the adjustment to the PI given the reclassifications has also been included in the above example; the approach followed for this is as described above.

In the example above, despite quite a large variation in LGI across the portfolio and a significant level of reclassification, the average LGI is relatively insensitive to the LGI portfolio improvement effect. Notwithstanding this observation, the LGI PIE is fully captured.

2.1.3 MATERIALITY THRESHOLD FOR MECHANISTIC JOIN-UP

In circumstances where results of the AQR suggest material issues with the bank's credit measurement or a strong PIE outweighing the NIE, there needs to be consideration to adjusting the forward looking projections from the stress test. With a comparison between the adjusted and unadjusted AQR PI and LGI calculation complete, an assessment can be made of whether the new information is sufficiently material to alter results. Two situations are envisaged:

- **Immaterial:** Where deviation in EL suggested by comparison of unadjusted with adjusted AQR parameters is less than or equal to a pre-defined quantitative threshold, it will be judged as immaterial and need not be investigated further. A "basic join-up" will be performed, as described in Section 2.1.5.

- **Material:** Where deviation in EL suggested by comparison of unadjusted with adjusted AQR parameters is greater than a pre-defined quantitative threshold, this will result in an adjustment as described in the next section.

2.1.4 JOIN-UP APPROACH FOR CASES WHERE AQR IDENTIFIED MATERIAL DIFFERENCES

The AQR exercise will identify performing exposures that should be re-classified as non-performing. In cases where such findings (or, more accurately, the AQR findings for a given portfolio in aggregate) result in a material difference in EL (where materiality is defined according to a pre-defined quantitative threshold), this would require an adjustment to future losses in the stress test as part of the join-up. This will be done by adjusting the year-end 2013 balance sheet for these reclassifications and also adjusting the PD PIT and LGD PIT (NEW) to account for the impact of the AQR findings (note that changes to these parameters can be both positive and negative). This is described in more detail below. For the avoidance of doubt, in cases where a bank's PD PIT or LGD PIT are higher than the AQR-unadjusted PI or LGI, then the PD PIT or LGD PIT following the join-up should not increase above the AQR-adjusted PI or LGI. It should also be noted, however, that in those cases where a bank's PD PIT or LGD PIT (NEW) is higher than the AQR-adjusted PI and LGI, there will not be an adjustment to the

PD PIT and LGD PIT (NEW). In a situation where the unadjusted PI is zero, the PD PIT will be set to the maximum of either PD PIT or the adjusted PI.

Note that if the AQR effect is judged to be material using the EL criteria as described, then both the PD PIT and the LGD PIT (NEW) will be adjusted for the underlying portfolio.

The individual impairment and provisioning review, as part of the AQR credit file review work block, will identify instances where changes in reserves or provisions are required for NPE. All sovereign, institutional and corporate exposures according to the AQR asset segmentation qualify for individual assessment. Findings of the credit file review will then be projected to the wider portfolio, with the aim of assessing the adequacy of provisions.

Further to this, the AQR will identify instances where changes are required for provisions for a bank's portfolio that would typically be impaired on a collective basis. All retail exposures according to the AQR asset segmentation qualify for the collective assessment, including the assessment of performing exposures in order to calculate IBNR. However only retail mortgages will have any adjustments for misclassification or collateral values, and therefore a join-up calculation is only required for retail mortgages. Other retail segments will be addressed via QA of the PD PIT and LGD parameters.[15]

In cases where the AQR findings result in a material difference in EL (where materiality is defined according to a pre-defined quantitative threshold), this would require an adjustment to future losses in the stress test as part of the join-up. The approach for different types of provisions will be as follows:

Individual/specific provisions: Material adjustments made to the PI, LGI or coverage ratio on NPEs as a result of the credit file review findings will be translated into an equivalent adjustment to the bank's PD PIT and LGD old and new parameters (agreed in the stress test QA) using the approaches described. In some countries, provisioning levels are set in a prescriptive way according to local accounting rules, e.g. coverage ratios are fixed for all banks according to the amount of time the customer has been in arrears. In these circumstances, an AQR adjustment may be made to the year-end 2013 provisioning levels if the observed loss experience in 2013 indicates that the prescribed local accounting coverage ratios are currently not sufficiently high to meet ECB thresholds set for the purposes of the comprehensive assessment. However, an adjustment of this sort does not necessarily imply that the bank's forward-looking projections are inappropriate, as it is often the case that banks will be projecting losses on an economic basis. As a result, forward-looking projections should be

[15] It should also be noted that the AQR collective provisioning looks at the most material portfolios, as such, low default portfolios where the AQR adjusted PI is high are unlikely (and would in any case be subject to the join-up materiality threshold)

assessed in the QA without prejudice to the AQR findings in such circumstances and adjustments only made where appropriate.

Collective provisions (retail mortgages only): Material adjustments made to the PI or LGI[16] (performing and non-performing exposures) as a result of the credit file review findings will be translated into equivalent adjustments to the bank's PD PIT and LGD OLD and NEW parameters (agreed in the stress test QA) using the approaches described. Changes will be solely limited to the impact of NPE misclassifications and incorrect property valuations – there will be no adjustment for e.g. differences in modelling approaches for collective provisions, collateral haircuts, etc.[17] In some countries, provisioning levels are set in a prescriptive way according to local accounting rules, e.g. coverage ratios are fixed for all banks according to the amount of time the customer has been in arrears. In these circumstances, an AQR adjustment may be made to the year-end 2013 provisioning levels if the observed loss experience in 2013 indicates that the prescribed local accounting coverage ratios are currently not sufficiently high to meet ECB thresholds set for the purposes of the comprehensive assessment. However, an adjustment of this sort does not necessarily imply that the bank's forward-looking projections are inappropriate, as it is often the case that banks will be projecting losses on an economic basis. As a result, forward-looking projections should be assessed in the QA without prejudice to the AQR findings in such circumstances.

Collective provisions – retail other and retail SME: No need for join-up, given no credit file review findings; the PD PIT and LGD PIT parameters will be assessed in the stress test QA.

Incurred but not reported (IBNR) provisions: Join-up only required on year-end 2013 balance sheet. IBNR provision flows over the period of the stress test will not be mechanically adjusted, other than to ensure that the coverage ratio on performing assets does not drop (as per the EBA methodology note).

For the avoidance of doubt, if the AQR findings identify that a bank's stock of provisions for year-end 2013 should change, in all cases the starting stock at year-end 2013 for the stress test will be adjusted. In those cases where the AQR findings result in a material deviation in EL, then a change will be made for the purposes of the join-up to adjust the starting stock at year-end 2013 and also the parameters for calculating the flow of provisions in the stress test, as described in detail in the sections below.

There is no difference in the approach that is applied for banks with restructuring plans approved by the European Commission as AQR findings should have no direct impact on the

[16] Defined as: (1 – cure rate) * LGL.

[17] It should be noted that the incremental change in AQR LGI from unadjusted to adjusted considers the baseline projection, as such the join-up is not impacted by this projection and there is no potential for a double count here.

planned actions related to asset sales or deleveraging, etc. – i.e. the plan should remain unchanged.

Adjusting PD PIT for AQR findings

In cases where the AQR findings are material, PD PIT parameters will be adjusted. This will be done using the same methodological approach as was applied for adjusting the credit risk benchmarks for different PD starting points. Importantly, this approach retains the year-on-year PD dynamics (i.e. stress test deltas) projected by the bank, and so uses as much of the banks' information as possible. It should be noted that the appropriateness of the "shape" of a bank's stress test deltas will be examined as part of the stress test QA and as such preserving the year-on-year dynamics is appropriate in the join-up. To ensure a fair and accurate application, mechanically the approach would be to:

1 Convert the bank's starting-point PD PIT and projections into distance-to-default (DtD) parameters. This is done by calculating the inverse normal parameter corresponding to the PD PIT. This approach is commonly used for applying PD stresses and is equivalent to the approach that is used by the ECB to apply PD stresses to different starting PD values in the ECB top-down model. The effect of this approach is generally to dampen the percentage increase in PD compared with a straight scalar for higher starting-point PDs;

2 Derive the year-on-year change in the DtD from the bank's projections;

3 Derive the change in DtD for the PI given the AQR findings;

4 Adjust the 2013 starting-point PD PIT to reflect the change in DtD implied by the move from PI unadjusted to PI adjusted and apply the unadjusted year-on-year change in DtD (calculated in step 2) to the new starting PD PIT;

5 Convert the resulting DtD figures for each year back to PD PIT.

Figure 5 below gives an example of these calculation steps.

Figure 5 Adjustment approach for starting point PD changes

				2013	2014	2015	2016
Post-stress test QA starting point PD				1.00%	1.50%	2.00%	1.80%
1. Convert to DtD				- 2.33	- 2.17	- 2.05	- 2.10
2. Derive YoY change in DtD					0.16	0.12	- 0.04
3. Derive change in DtD for AQR PI	Unadjusted	1.90%	-2.08				
	Adjusted	2.50%	-1.96				
	Difference		*0.12*				
4. Apply DtD delta				- 2.21	- 2.06	- 1.94	- 1.98
5. Convert back to PD				1.35%	1.99%	2.63%	2.37%

The losses given in the stress test results are assumed to scale with the product of PD * EAD * coverage ratio (i.e. the correlation between PD and LGD is assumed to be constant throughout the stress and before and after the AQR). Given this, the losses forecasted in the stress test will be re-calculated in each year applying the adjusted PD PIT figures to the stress test results. For the purposes of re-calculating forecasted losses, reductions in performing exposure will also be taken into account (both due to AQR re-classifications at year-end 2013 and due to increased PDs in future years where reductions in performing exposure would need to be carried forward). Figure 6 below provides a numerical example.

Figure 6 Illustrative application of adjusted PD to stress test results

1) Stock variables at YE2013. Provisions of 30 (100 * 30% = 30)

Post stress test QA bank-led results		2013	2014	2015	2016
Stock	Performing exposure (EAD)	9,900.0	9,751.5	9,556.5	9,384.5
	Non-performing exposure	100.0	248.5	443.5	615.5
	Specific / collective provisions	30.0	74.6	133.1	184.7
Parameters	PD PIT (post stress test QA)	1.00%	1.50%	2.00%	1.80%
	LGD PIT (post stress test QA)	30%	30%	30%	30%
Flow	Default flow		148.5	195.0	172.0
	Losses / new provisions (EAD * PD * LGD)		44.6	58.5	51.6

2) Forecasted losses / new provisions added to stock each year

AQR findings		2013	2014	2015	2016
AQR	Adjusted PD incorporating difference in AQR PI pre- and post-adjustment	1.35%	1.99%	2.63%	2.37%

3) AQR findings result in a re-classification from performing to non-performing. Adjusted PD used to adjust forecasted defaults.

4) Reduced performing exposure factored in to re-calculation of losses

Adjusted stress test results		2013	2014	2015	2016
Stock	Performing exposure (EAD)	9,865.0	9,668.4	9,414.5	9,191.0
	Non-performing exposure	135.0	331.6	585.5	809.0
	Specific / collective provisions	40.5	99.5	175.7	242.7
Parameters	PD PIT (adjusted for AQR findings)	1.35%	1.99%	2.63%	2.37%
	LGD PIT (adjusted for AQR findings)	30%	30%	30%	30%
Flow	Default flow		196.6	253.9	223.5
	Losses / new provisions (EAD * PD * LGD)		59.0	76.2	67.0

5) Bank losses re-calculated using adjusted PDs, lower starting performing exposure (9,865.0 * 1.99% * 30% = 59.0)

Note: small differences in numbers due to rounding
LGD under stress assumed to remain at 2013 level for simplicity
Losses calculated as EAD * PD * LGD, assuming correlation of zero between PD and LGD

The example above includes two tables, one with the post-stress test QA bank results and another with the post-AQR adjusted results. Performing exposure, non-performing exposure and provisions are stock variables, PD PIT and LGD PIT are parameters applied in each year of the stress test, and default flow and losses are flow variables for each year of the forecast. Losses/new provisions are calculated as PD * EAD * coverage ratio, in this example the correlation between PD and LGD is assumed to be zero, as such losses are calculated as EAD * PD * LGD in each year of the projection. It should be noted that there could be cases where the

bank results differ from the EAD * PD * LGD calculation due to correlation between PD and LGD in the stress. In such cases the ratio between bank results and EAD * PD * LGD gives the implied correlation between PD and LGD; this ratio would be assumed to be constant throughout the projection and before and after the adjustment of the stress test results with the AQR findings.

In the lower table the 2013 starting point for the stress test is adjusted by applying the adjusted PD PIT to account for the AQR findings; this is so that the starting performing exposures are reduced for the calculations in future years. Further to this, the adjusted PD PIT values are applied in all years of the forecast in order to recalculate the forecasted losses. For example, following the adjustment to the stock of performing exposures in 2013, this declines from 9,900.0 to 9,865.0, while the stock of non-performing exposures increases from 100.0 to 135.0. The adjusted PD PIT of 1.99% is applied in 2014 so that the recalculated losses in 2014 are 59.0 (9,865.0 * 1.99% * 30% = 59.0) compared with 44.6 (9,900.00 * 1.50% * 30% = 44.6).

In those cases where the AQR adjusted-PI is materially lower than AQR-unadjusted PI (i.e. there is a strong portfolio improvement effect), the bank's starting-point PD would be investigated to determine whether or not a change would be appropriate.

For the avoidance of doubt, in cases where a bank's PD PIT or LGD PIT are higher than the AQR-unadjusted PI or LGI, the PD PIT or LGD PIT following the join-up should not increase above the AQR-adjusted PI or LGI. In cases where a bank's PD PIT or LGD PIT is higher than the AQR-adjusted PI or LGI, there will not be an adjustment to the PD PIT and LGD PIT. In a situation where the AQR-unadjusted PI is zero, the PD PIT will be set to the maximum of either PD PIT or AQR-adjusted PI.

Adjusting LGD PIT for AQR findings

In those cases where AQR findings are material (in terms of EL as discussed above) the LGD PIT (NEW) in each year of the stress test will be adjusted in light of the AQR findings. This adjustment will be done in an additive manner; for example, if the AQR identifies that the unadjusted LGI should increase from 10% to an adjusted LGI of 20%, the LGD PIT (NEW) ratios in each year for the stress test will be increased by 10% in absolute terms. The ratio after this addition will be capped at 100%, so that for example, if the ratio is originally 80% in year 2 of the stress test and the AQR adjustment leads to an increase of 25 percentage points the post-adjustment ratio is capped at 100% as opposed to 105% (80% + 25%).

Figure 7 below provides a numerical example for a change in LGD PIT (NEW). It should be noted that, for simplicity, changes in PD PIT parameters have been removed from the example.

In practice, if these AQR findings are both to apply to the same portfolio, then both impacts would need to be taken into account.

Figure 7 Numerical example – join-up approach for specific or collective provision level adjustments

Post stress test QA bank-led results		2013	2014	2015	2016
Stock	Performing exposure (EAD)	9,900.0	9,751.5	9,556.5	9,384.5
	Non-performing exposure	100.0	248.5	443.5	615.5
	Specific / collective provisions	20.0	64.6	123.1	183.3
Parameters	PD PIT (post stress test QA)		1.50%	2.00%	1.80%
	LGD PIT NEW (post stress test QA)		30%	30%	35%
Flow	Default flow		148.5	195.0	172.0
	Losses / new provisions (EAD * PD * LGD)		44.6	58.5	60.2

1) New provisions added to stock each year, increase in provisions driven by:
- Increase in non-performing exposures (i.e. due to new defaults), and
- Any increases in coverage ratio in stressed years.

2) In 2014, new provisions from new defaults (148.5 * 30% = 44.6)

3) AQR findings result in an increase in LGD of +10% in 2014-16

AQR findings		2013	2014	2015	2016
AQR	Adjusted LGD incorporating difference in AQR LGI pre- and post-adjustment		+10.0%	+10.0%	+10.0%

Adjusted stress test results		2013	2014	2015	2016
Stock	Performing exposure (EAD)	9,900.0	9,751.5	9,556.5	9,384.5
	Non-performing exposure	100.0	248.5	443.5	615.5
	Specific / collective provisions	20.0	79.4	157.4	234.8
Parameters	PD PIT (adjusted for AQR findings)		1.50%	2.00%	1.80%
	LGD PIT NEW (adjusted for AQR findings)		40%	40%	45%
Flow	Default flow		148.5	195.0	172.0
	Losses / new provisions (EAD * PD * LGD)		59.4	78.0	77.4

4) AQR adjustment added to coverage ratio for each year resulting in higher provisions

5) In 2015, provisions increase post-AQR due to higher coverage ratio (195.0 * 40% = 78.0) compared to (195.0 * 30% = 58.5)

Note: small differences in numbers due to rounding
Losses calculated as EAD * PD * LGD, assuming correlation of zero between PD and LGD

In this example, performing exposure, non-performing exposure and specific/collective provisions are stock variables as recorded in the end-2013 balance sheet positions; PD PIT and LGD PIT (NEW) are ratios; and losses are year-by-year absolute losses (flow variable) over the three years of the exercise. Importantly, these losses or new impairments arise from the end-2013 performing exposures. As shown in the *unadjusted* table at the top in the figure above, the new losses arise as performing exposures become non-performing exposures and additional provisions are made in line with the LGD PIT (NEW). For example, in 2014 new provisions of

44.6 are made as the LGD PIT (NEW) is 30% and 148.5 of performing exposures have become non-performing (148.5 * 30% = 44.6).

As shown in the figure above, the AQR findings (a change in the AQR LGI of 10% from pre- to post-adjusted) are accounted for by adding this adjustment to the LGD PIT (NEW) in all years of the stress test. This results in the following changes in provisions:

In 2014 the LGD PIT (NEW) increases from 30% to 40% resulting in new provisions of 59.4 (148.5 * 40%) compared with 44.6 previously (148.5 * 30%).

In 2015 the LGD PIT (NEW) increases from 30% to 40% resulting in new provisions of 78.0 (195.0 * 40%) compared with 58.5 previously (195.0 * 30%).

In 2016 the LGD PIT (NEW) increases from 35% to 45% resulting in new provisions of 77.4 (172.0 * 45%) compared with 60.2 previously (172.0 * 35%).

An additive approach is proposed as opposed to a multiplicative approach in order to correctly adjust for those portfolios with a low starting LGD. In such cases, if a multiplicative scalar approach were used instead, the adjustment to forecasted provisions would be overstated. For example, for a real estate portfolio with a low 2013 LGD of 5%, which increased to 20% in 2015 (due to real estate prices in the scenario), an increase in 2013 from 5% to 15% would result in a scalar of 300% (15/5), which when applied in 2015 would give an LGD of 60% (20% * 3 = 60%).

As previously mentioned, when adjustments are made to provision coverage ratios to incorporate the AQR findings, these will be capped such that the final ratio is at a maximum of 100%.

It should be noted that any second order indirect impacts of accrual accounted credit risk adjustments will not be reflected as part of the join-up (e.g. interest income implications of changes in the NPE projection).

Other accrual accounted credit risk AQR changes

As discussed above, where material, AQR findings relating to reclassifications from performing to non-performing and changes in provision coverage will be accounted for in the join-up by adjusting starting point parameters. Other elements of the join-up will be incorporated during the QA (see Section 2.1.1) or through bank-led adjustments, including changes related to the PP&A review and DIV exercise as described in Section 2.3.

Finally, the AQR may result in additional changes to the starting balance sheet:

1 Changes in collateral valuations

2 Changes in IBNR provisions coverage

The following sub-sections outline the join-up approach to be taken for each of these changes.

Changes in collateral valuation

As part of the AQR, in-scope assets pledged as collateral without a market valuation by an independent, external appraiser since 1 January 2013 will be subject to a third party revaluation. This has both first and second-order effects.

The first-order effect, the impact of the re-valuation of collateral on the (point-in-time) PI and LGI, is already captured by the adjustment to provision levels. Second-order effects such as the non-linear impact of collateral revaluations on future defaults are difficult to estimate, and would require a very extensive data collection. For the sake of a simple, replicable, consistent and transparent join-up proposal, second-order effects of collateral revaluation are disregarded.

Changes in IBNR provisions coverage

The results of the AQR may include an adjustment to IBNR provisions, which will directly affect the stock figures held on the year-end 2013 balance sheet. The join-up approach for IBNR provisions will involve adjusting the year-end 2013 starting balance sheet for these findings; however, projected IBNR flows will not be adjusted. In line with the EBA stress test methodology, the coverage ratio for the projected stock of IBNR provisions will be constrained to ensure that this does not decrease below the starting 2013 level during the stress test horizon.

Approach to dealing with misalignment between segmentation of the EBA templates and the AQR segmentation

One challenge for the join-up process is that the AQR segmentation is not the same as the EBA segmentation. The AQR segmentation was chosen to ensure that key asset finance segments such as shipping and project finance were clearly delineated – particularly as these portfolios often span across regulatory segments such as specialised lending and corporate. The EBA templates do not use this segmentation and are instead aligned with COREP, which is less specific from an asset segment perspective.

To address this issue, the additional SSM stress test templates require banks to submit stress test results for AQR segments where these are included in Phase 2 of the AQR; these include the following additional segments within corporate: project finance, shipping, aviation and state-owned enterprise. Other AQR segmentation can be aligned with the EBA segmentation at a high-level; as such, the join-up can be performed on like-for-like asset segments. In cases where a sub-portfolio is not included in the AQR, no adjustment is made to the bank's PD PIT. This

will be inferred where required (e.g. if a bank's corporate portfolio has a PD PIT of 2%, and splits 50:50 between shipping and large corporates (non-real estate) where shipping has a PD PIT of 3%, the PD PIT of the large corporates (non-real estate) sub-portfolio is inferred as 1%.

2.1.5 JOIN-UP APPROACH FOR CASES WHERE AQR IDENTIFIED IMMATERIAL DIFFERENCES ("BASIC JOIN-UP")

The findings of the AQR suggest a number of adjustments to year-end 2013 balance sheet results. Any changes identified in the AQR can be applied directly to the starting-point balance sheet; this will be done in all cases, even where AQR changes are identified as immaterial (see Section 2.1.3 for further details). Where AQR findings are immaterial, the assumed join-up process for all banks is to keep the loss rate (expressed as a percentage of exposure at default (EAD)) the same as in the pre-join-up results. In other words, the projected losses will reflect the changes in the stock of performing exposures as these roll forward from 2013 into future years, but not take into account the PIE or NIE. This simplification has been chosen for the ease of implementation and transparency around the calculation.

There is no difference in the approach that is applied for banks with restructuring plans approved by the European Commission, as AQR findings should have no direct impact on the planned actions related to asset sales or deleveraging, etc. – i.e. the plan should remain unchanged.

The example below illustrates the join-up approach where AQR findings were immaterial.

Figure 8 Illustrative changes to stock projections for AQR NPE reclassifications

Post stress test QA bank-led results		2013	2014	2015	2016
Stock	Performing exposure (EAD)	100.00	98.50	96.53	94.79
	Non-performing exposure	10.00	11.50	13.47	15.21
	Specific / collective provisions	3.00	3.45	4.04	4.56
Parameters	PD PIT (post stress test QA)	1.00%	1.50%	2.00%	1.80%
	LGD PIT (post stress test QA)	30%	30%	30%	30%
Flow	Default flow		1.50	1.97	1.74
	Losses / new provisions (EAD * PD * LGD)		0.45	0.59	0.52

AQR findings		2013
AQR	Reclassification to NPE	10.00

1) AQR identifies reclassifications from performing to non-performing for YE2013

2) Reclassification applied to starting stock at YE2013

Adjusted stress test results		2013	2014	2015	2016
Stock	Performing exposure (EAD)	90.00	88.65	86.88	85.31
	Non-performing exposure	20.00	21.35	23.12	24.69
	Specific / collective provisions	6.00	6.41	6.94	7.41
Parameters	PD PIT (adjusted for AQR findings)	1.10%	1.50%	2.00%	1.80%
	LGD PIT (adjusted for AQR findings)	30%	30%	30%	30%
Flow	Default flow		1.35	1.77	1.56
	Losses / new provisions (EAD * PD * LGD		0.41	0.53	0.47

3) Implied change in 2013 PD PIT given change in stock of performing exposure

4) Loss rate in future years as a % of EAD kept constant, projected losses take reduction in stock of performing exposures into account

Note: small differences in numbers due to rounding
LGD under stress assumed to remain at 2013 level for simplicity
Losses calculated as EAD * PD * LGD, assuming correlation of zero between PD and LGD

In the example above, the AQR identifies reclassifications of performing to non-performing exposures in 2013 of 10. Following this, the performing and non-performing "stock" variables for 2013 are adjusted accordingly, i.e. the performing stock is decreased by 10 and the non-performing stock is increased by 10. Further to this, the loss rate (as a percentage of performing exposure) remains the same in each year of the projection; as such, the projected default flow and new provisions decrease slightly given the reduction in performing stock following the reclassification.

In some cases, when the constant change to stock variables is applied, "impossible" results could be obtained. For example, it is conceivable that a bank with a very low-quality portfolio

and very adverse AQR results could find that projected NPE balances increase to a level that is greater than the total non-performing and performing exposures combined. As a result the stock of non-performing exposures in the stress test for each portfolio will be "capped" at the total exposure for that portfolio.

Capping stock variables at the maximum possible level for a portfolio may appear conservative, but the circumstances that would cause such an event are extreme and it will usually be the only reasonable assumption. Nevertheless, in any situation where a cap is applied expert judgement will be applied by the ECB to ensure that the assumption is appropriate.

2.2 LEVEL 3 FAIR VALUE EXPOSURES JOIN-UP

A number of the elements of the level 3 fair value exposures review may impact the forward-looking stress test, in particular in relation to paragraph 117 of the EBA methodology document[18]. Some of these are best dealt with at the bank level, as the findings will be known well before stress tests are close to completion and have limited potential for broad disclosure. Other areas are better dealt with in a centrally-led join-up given concerns about the Market Abuse Directive. It is important to note that adjustments to the level 3 fair value exposures stress test could be either positive or negative, however these adjustments are necessary to ensure the most accurate outcome possible and avoid double-counting. All adjustments must be performed separately for the baseline and adverse scenarios.

The quantitative impact of the level 3 fair value exposures review within the AQR can be broadly separated into three components – adjustments to cash positions, adjustments to derivatives positions and adjustments to CVA.

For all banks, any positions under HFT, AFS or FVO portfolio (whether cash or derivatives for FVO), require the same treatment within the stress test, namely application of stressed market risk factors and haircuts to exposures.

The join-up approach for FVO positions varies depending on whether they take the form of cash, derivatives or CVA:

- Cash positions – centrally-led join-up
- Derivatives positions – bank-led join-up
- CVA – bank-led join-up

[18] See EBA Methodology EU-wide Stress Test 2014 (dated 29 April 2014).

- For HFT positions only, banks are able to apply different treatments within the stress test depending on the level of trading activity (simplified vs. comprehensive approach) which means that the HFT exposures cannot be dealt with in a consistent way across banks. For banks applying the simplified approach, no adjustment will be required in relation to level 3 exposures, given the fact that any adjustment would be expected to have an immaterial impact on the overall stress result, and given the stress testing methodology does not permit any meaningful join-up.

- For banks applying the comprehensive approach, adjustments will be required to adjust HFT positions in line with the adjustments made for FVO positions as described above, differentiating between cash, derivatives and CVA.

Adjustments to all real estate exposures should be treated in line with the methodology described in this section (i.e. the market risk approach), and the impact should be reported in the real estate funds line with the additional SSM stress test templates.

Banks excluded from work block 8 in the AQR, level 3 fair value exposure review, which do not have relevant level 3 AQR findings, will be excluded from the level 3 join-up.

2.2.1 OVERVIEW OF THE APPROACH

A number of the elements of the level 3 fair value exposures review within the AQR may materially impact the forward-looking stress test. Some of these are best dealt with at the individual bank level, as the findings will be known well before the stress test is close to completion and have limited potential for broad disclosure. Moreover, given the nature of some components of the stress test, it would not be possible for a centrally-led join-up to yield appropriate adjustments following the level 3 fair value exposures review, and thus banks will be required to make the necessary adjustments. Other areas are better dealt with in a centrally-led join-up, where this sort of central adjustment is possible.

There are four methods available to adjust the stress test on the basis of the AQR, and each of these methods will be applied separately for the different asset classes / position types within the level 3 fair value exposures review. They will differ depending on whether banks apply the simple or the comprehensive approach for the market risk component of the stress test. These four methods are:

- Method 1: Centrally-led adjustment: adjustment via direct use of AQR-built models

- Method 2: Centrally-led adjustment: simple scaling of stress test result through direct adjustment of position value

- Method 3: Bank-led adjustment
- Method 4: No adjustment required

The table below provides a summary of the proposed method to be applied for each component in the fair value exposures review:

	HFT : Simplified approach	HFT : Comprehensive approach	All FVO / AFS positions
Equities	4	2	2
Loans	4	1	1
Bonds	4	1	1
Securitisations	4	1	1
Real estate	4	2	2
Derivatives	4	3	3
CVA	4	3	3

For Methods 1 to 3 additional data collection is required, this will be covered by the AQR data collection.

As mentioned above, within the market risk component of the stress test, banks apply either the simplified or the comprehensive approach for HFT positions (depending on the materiality of trading operations) which means that HFT exposures cannot be dealt with in a uniform way across all banks. However, all FVO and AFS positions should be treated in the same way for all banks, regardless of whether they apply the simplified or comprehensive approach for HFT positions.

Banks applying the simplified approach for HFT positions will have limited HFT positions, and no adjustment will be required for these banks for these positions. Any adjustment would be expected to have an immaterial impact on the overall the stress result.

For banks applying the comprehensive approach for HFT positions, a different methodology will be applied for each of the following position types: cash positions, derivatives positions and CVA.

For all FVO positions, the approach to be taken will be the same as that described below for banks under the HFT comprehensive approach, for cash, derivatives and CVA.

For cash positions, whether HFT, AFS or FVO, a centrally-led approach will be taken. The following types of cash position require a distinct, but centrally-led join-up approach:

- Level 3 loan, bonds and securitisation portfolios: *The NCA bank team will calculate the impact of the stress on the post-AQR adjusted year-end 2013 value for those positions that are materially impacted by the AQR using models developed in house.*

- Level 3 equities and real estate (including real estate funds): *A direct adjustment will be made to equity and real estate positions, based on the year-end 2013 AQR-adjusted value of the position multiplied by the relevant stress shock.*

Adjustments to all real estate exposures should be treated in line with the methodology described in this section (i.e. the market risk approach), and the impact should be reported in the stress test templates. For derivatives positions, the adjustment to the stress test will necessarily be bank-led, as no centrally-led join-up will be possible. Banks will be expected to take each adjustment arising on derivatives positions from the AQR, and calculate the impact on the stress test. They will then present these results back to the NCA together with an explanatory note outlining in detail the adjustments made, which will be shared with the ECB. This would include changes to the pricing model methodology or parameters, changes to reserves, etc.

For CVA, a bank-led join-up will be required, as the CVA adjustment relies on adjustments made to derivatives MtM values, and so will be linked with the above approach for derivatives.

The bank-led adjustments will be subject to thorough QA.

2.2.2 ADJUSTMENT METHODOLOGY

As mentioned above, within the HFT component of the stress test, banks apply either the simplified or the comprehensive approach (depending on the materiality of trading activity and on whether the respective bank has VaR models in place).

As described in the EBA stress test methodology, the simplified approach applies net trading income (NTI) volatility as a proxy of banks' sensitivity with respect to adverse market risk conditions.

The comprehensive approach applies a set of instantaneous shocks to all positions, whether HFT, FVO or AFS.

Adjustments for HFT positions for banks under the simplified approach

Banks applying the simplified approach calculate the stress impact on the P&L or the average NTI over the previous three years, as:

Baseline scenario: 1 times the standard deviation with respect to the previous three years' NTI (2011-13).

Adverse scenario : 2 times the standard deviation with respect to the previous five years' NTI (2009-13)

This stress impact will be distributed over the three years of the exercise.

Under this simplified approach, it is not straightforward to make any direct adjustment to the stress impact based on the conclusions of the AQR, as the methodology is based purely on NTI. Moreover, it can be expected that any adjustment to balance sheet values arising from the AQR would be likely to lead to a reduction in the stress impact according to the methodology above. Finally, all banks permitted to use the simplified approach have small trading books/fair value positions in relation to the overall balance, and therefore any adjustment to the overall stress impact would be expected to be immaterial.

Therefore, for the reasons outlined above, it is proposed that no adjustment be made to the stress test as a result of the AQR for the HFT positions of banks applying the simplified approach. However, material adjustments (subject to a pre-defined quantitative threshold) are to be reflected during QA.

Note that there is no direct stress impact on derivatives or CVA for banks applying the simplified approach, so no CVA adjustment will be required.

Adjustments to banks for HFT positions under the comprehensive approach, and all FVO and AFS positions for all banks (whether simplified or comprehensive)

As discussed above, the comprehensive approach requires banks to apply a set of instantaneous shocks to all positions, whether they are HFT, FVO or AFS. Banks are required to apply the market risk parameters provided by the EBA and project stress test impact gains and losses for these positions, under two macro-economic scenarios and four historical scenarios. All of these positions should be valued by internal pricing and risk management models. The stress impact will be distributed over the three years of the exercise.

The adjustment required for banks under the comprehensive approach will differ for cash positions, derivatives positions and CVA.

Adjustments will be made for material mis-valuations; materiality is assessed as follows:

- If any of the five different types of assets (loans, bonds, securitisations, real estate or equities) individually moves the CET1 ratio of the bank materially (subject to a pre-defined quantitative threshold) as a result of the AQR, the result should be considered material and the impact on the stress test should be assessed for that asset type and that asset type only.

- Notwithstanding the above, if in aggregate the total impact of work block 8A has a material impact on the CET1 ratio (subject to a pre-defined quantitative threshold), then the two types of assets with the biggest impact on the CET1 ratio as a result of the AQR should be included in the stress test join-up analysis (subject to a pre-defined quantitative threshold).

- If an individual model results in a change in valuation for the purposes of the AQR that is deemed immaterial, no additional analysis is required. "Model" refers to the type of model applied to a particular portfolio of assets or individual assets. For example a single model may be applied to a portfolio of 1,000 loans. Each individual loan may have an impact lower than the materiality threshold, but in aggregate across the whole portfolio the impact could be very material. The materiality threshold is therefore applied at the model level. Note that revaluation should be performed according to EBA methodology (e.g. with regards to treatment of additional risk factors).

Level 3 cash positions

All cash positions held at fair value will be subject to the same methodologies as described below. For cash positions, a centrally-led approach will be taken as the adjustments to the stress result can be made by the ECB and these adjustments will fit within the timeframe of the AQR and stress test. For cash positions, either Method 1 or Method 2 will be applied.

Level 3 equities and real estate (and real estate funds)

Within the stress test, all real estate assets held at fair value (including real estate funds) are stressed by applying a haircut to the position value. For equity positions the calculation of the stress effect is less straight-forward given the fact that the market risk scenarios include assumptions on the movement of equity indices, equity volatility and equity dividends under stress. It is however reasonable to assume that linear adjustments are justified. Therefore, adjusting the stress test for the impact of the AQR will be straightforward, and will simply involve calculating the delta to market value implied by the AQR for each asset class, and multiplying this by the relevant relative stress effect stemming from the bank's calculation in the stress test. This is Method 2 as outlined in Section 2.2.1.

The example diagram below shows the impact of the stress tests on a single emerging markets equity position:

- Starting value of equity position = 100

- Stress effect of 47% applied to emerging markets equities in macro-economic adverse scenario

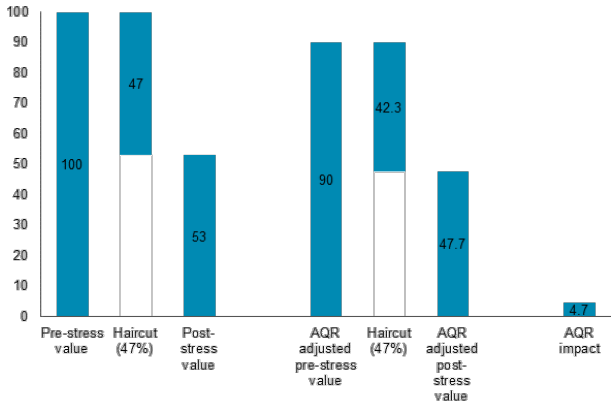
- Post-stress value of equity position is 53, and the impact of the stress is 47.

Assume as a result of the AQR that an adjustment of 10% is made to this position, meaning its new year 0 starting value is 90. The adjustment that is made to the stress result is as follows:

AQR-adjusted starting value of equity position = 90

Stress effect of 47% applied to emerging markets equities in macro-economic adverse scenario

Post-stress value of equity position is 47.7, and the impact of the stress is 42.3.



Therefore, the overall impact of the AQR on the stress result would be calculated as 47 – 42.3 = -4.7.

An adjustment for real estate would work in the same way as the equity example above, except that the haircut applied would of course be different. For the avoidance of doubt – any decrease in real estate valuations resulting from the AQR would lead to a reduction in the stress applied to these instruments – i.e. AQR findings will never be double-counted in relation to real estate.

Level 3 loan portfolios, bonds and securitisations

For loan portfolios, bonds and securitisations, the impact of the AQR on the stress test will be more complex, as the outcome of the AQR for level 3 loans, bonds and securitisations that are materially mis-valued will be a re-valuation of these positions using models developed by the NCA bank team, which may include third parties. The stress test for these types of positions involves a shock to the credit spread, and it is therefore not possible to make a direct adjustment to the position value as proposed in Method 2. Therefore, the NCA-built models will be used to directly estimate the impact of the AQR for these positions.

The process will be as follows:

As part of the AQR, the NCA bank team collects position-level information on level 3 bonds, loans and securitisations, and performs a revaluation using its own model/calibration if positions are materially mis-valued by the banks;

If an adjustment is required, the NCA bank team calculates the new stress impact directly in their own model as:

$$\text{NewStressImpact} = \text{MtM}_{\text{StressNewSpread}} - \text{MtM}_{\text{BaselineNewSpread}}$$

- where and $\text{MtM}_{\text{BaselineNewSpread}}$ = market value of the position following the revaluation (i.e. applying the spread and model calibration used in the NCA Bank team model),
- and $\text{MtM}_{\text{StressNewSpread}}$ = stressed market value of the position applying the relevant spread shock from the stress test to the NCA bank team model;

The original stress impact for this position will then need to be deducted from NewStressImpact to give the final adjustment for that position. The original stress impact for that position will need to be provided by the bank;

This stress calculation will need to be applied by the NCA bank team for all positions that exceed the materiality threshold outlined above, and the total adjustment will be added to the bank's overall stress test results.

Worked example: RMBS securitisation position

A. Position details (bank original valuation):

The bank currently values a RMBS position at €420 million corresponding to a spread of 200 basis points above EURIBOR used to discount cash-flows

A1 Position:	RMBS
A2 Rating:	A+
A3 Notional:	€500 million
A4 Original bank valuation:	€420 million
A5 Original bank spread:	200 basis points

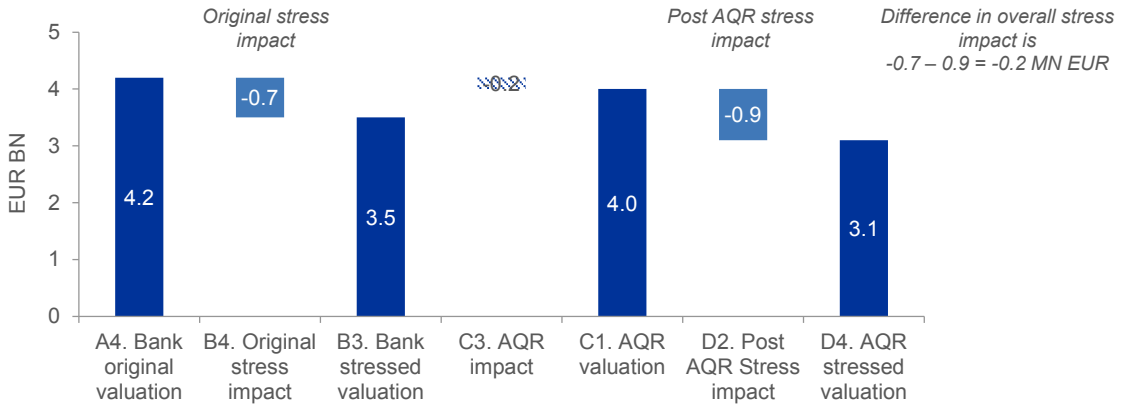
B. Stress test result (bank original):

In the stress test the bank is required to stress the spread by 270%, which results in a €70 million decrease in value.

B1 Market risk stress (comprehensive approach):	270% increase in spread
B2 Original bank *shocked* spread:	540 basis points
B3 Original bank *stress* valuation:	€350 million
B4 Stress test impact (A4 – B3):	**-€70 million**

C. AQR revaluation result:	
However, during the AQR, the AQR NCA bank team independently revalues the position at €400 million in a new model with alternative assumptions for pre-payments and default correlations, and using a new spread of 220 basis points above EURIBOR used to discount cash-flows19	
C1 AQR (re) valuation:	€400 million ($MtM_{BaselineNewSpread}$)
C2 AQR spread:	220 basis points (Baseline NewSpread)
C3 AQR impact (A4 – C1):	**-€20 million**
D. Stress test result using AQR valuation:	
The impact of the AQR on the stress test is to change the spread-shock, and the corresponding impact of the stress	
D1 Market risk stress (comprehensive approach):	270% increase in spread
D2 Post AQR *stress* valuation:	€310 million ($MtM_{StressNewSpread}$)
D3 Post AQR *shocked* spread:	594 basis points (StressNewSpread)
D4 Post AQR stress test impact (C1 – D2):	**-€90 million (NewStressImpact)**
E. Adjustment to stress test result	
Finally the impact of the AQR on the stress test can be calculated as the difference between the original stress test impact and the post-AQR stress test impact	
E1 Stress Test impact (copy B4):	-€70 million
E2 Post AQR stress test impact (copy D4):	-€90 million
E3 Final adjustment (D4 – B4):	**-€20 million**

The chart below provides the same result visually.



The EBA methodology is based on the application of stressed market risk factors. The computation of the overall effect on NTI, other comprehensive income (OCI) or P&L is subject to the restrictions of paragraph 121 of the EBA methodological note: "…net gains resulting from changes within in a major risk factor (e.g. risk factor category "interest rates") should be

[19] Note that the AQR revaluation is required to use the ECB Base Case scenario (cf. AQR Manual, Section 8.2)

reduced by 30% while net losses should be accounted for in full…" Thus any join-up adjustments have to be made on a risk factor level.

In the above worked example, the total impact of the AQR on the stress test result was an increase of €20 million, from €70 million to €90 million, for the position in question. The AQR valuation is €400 million, and the impact is 20/400 = 5% of MtM.

Derivatives positions

Material adjustments resulting from the level 3 fair value exposures review of derivative pricing models should have an impact on the forward-looking projections of the bank, both directly through market value adjustments, and also through the implications for fair value reserves (which explicitly need to be stressed as part of the EBA stress test). Given the non-linear nature of the relationship between risk factors and the valuation of the derivatives positions of the bank, it is not feasible to perform any join-up calculation on a centrally-led basis for derivatives. As a result, where adjustments are material (according to a pre-defined quantitative threshold), the join-up for derivatives needs to be bank-led.

All issues with derivative pricing models highlighted by the AQR should be communicated to the banks applying the comprehensive approach. The bank should be asked to assess the impact of the issues on the forward-looking projection of gains/losses for the trading book and include this in its baseline and adverse scenario stress test submissions. For the avoidance of doubt – the bank should not be informed of the AQR quantification of the impact – only the nature of the issue to avoid issues with the Market Abuse Directive. Only issues that have a negative impact on the capital position of the bank should be considered in the stress test.

The bank should be required to provide to the NCA the impact based on the baseline and adverse scenario, and all four historical scenarios, of each issue identified, if material. The bank should provide an appropriate justification of the impact of the issue identified

The exact process for making the adjustments as a result of the derivatives pricing model review will be as follows:

The bank will review the outcome of each AQR adjustment arising from the derivatives pricing model review (and core processes review if appropriate).

It will assess the impact of each adjustment on the stress test results on a case by case basis, depending on the type of adjustment made within the AQR. Some example approaches are outlined below:

- Re-calculate stress test result for specific derivatives positions using revised /improved pricing model;
- Estimate impact on stress test result using separate analysis if improvements to pricing model are not yet implemented;
- Estimate stress test impact using separate analysis from changes to model reserves.

The bank will then be required to present the results back to the NCA bank team with an explanation of the outcome. There will be QA of these results

CVA

CVA is stressed within the stress test via haircuts provided in the scenario to the MtM values (after the application of the market risk shocks) of over-the-counter (OTC) derivatives. These haircuts are fixed and will not be affected by the outcomes of the CVA review within the AQR; they differ for investment grade and non-investment grade counterparties.

Therefore, the only impact of the AQR on the CVA stress test will be through adjustments made to the mark-to-market values of derivatives from the AQR, to which the haircut will then be applied.

Therefore, in line with the adjustment methodology for derivatives, the adjustment methodology will be bank-led: banks will be required to estimate the impact on the CVA stress of adjustments to the values of derivative positions as a result of the AQR, i.e.

$CVAStress_{Delta} = MtM_{DeltaDerivatives} \times CVAHaircut$

where $MtM_{DeltaDerivatives}$ is the change in MtM for derivatives positions resulting from the AQR, only for those positions that affect the CVA stress test (i.e. excluding derivatives covered by CSAs and derivatives that are cleared through CCPs), and CVAHaircut is the relevant haircut required in the stress test. As mentioned above, the haircuts differ for investment grade and non-investment grade, so the calculation above will need to be performed separately for these two cohorts.

The impact will need to be calculated under the baseline and adverse scenario and all four historical scenarios.

Note that the AQR adjustment to banks' existing CVA calculation is already included in the AQR adjusted CET1.

A. Current portfolio (pre-AQR assessment) – sub-investment grade counterparties *The bank has a derivative portfolio with MtM (for sub-IG counterparties only) which is used as an input to the stress test based on existing valuation models. Note the current CVA (A4) is not an input into the stress shock, and the CVA stress only applies to derivatives without a CSA, and excludes positions with a CCP*	
A1 Current MtM:	€100 million
A2 CVA stress shock:	15% of MtM (CVAHaircut)
A3 CVA stress test result:	€15 million
A4 Current CVA:	€10 million
B. AQR impact on valuation and CVA *During the AQR both the valuation models and CVA calculation will be assessed, which may result in impact on both numbers A1 and A4:*	
B1 Post AQR MtM:	€110 million
B2 Post AQR CVA:	€15 million
C. Impact of AQR on CVA stress test *Only the impact on the value of the portfolio will have an impact on the CVA stress. No change results from difference between pre and post AQR current CVA.*	
C1 Change in MtM (B1 – A1):	€10 million ($MtM_{Deltaderivatives}$)
C2 Change in CVA Stress (C1 * A2):	€1.5 million ($CVAStress_{Delta}$)

2.3 BANK-LED JOIN-UP AND OTHER DATA CONSIDERATIONS

Banks will be required to include a number of findings from the AQR in their stress tests. A bank-led approach is chosen for these findings given that a) the information from the AQR will be available in time for the findings to be included in the baseline and adverse scenario of the stress test, b) there is little/no implication for the Market Abuse Directive and c) often the nature of the finding makes a centrally-led join-up very difficult. The issues involved tend to be relatively specific and are not included in any way in the AQR adjusted CET1 calculation, there is therefore no double-counting.

2.3.1 OVERVIEW OF THE APPROACH

Changes in the classification of financial instruments as a result of the PP&A review should be included in the stress test if they have a material impact. The best way to achieve this is for the bank to be informed of the finding and to include it within its stress test.

Misclassifications to asset segments identified in the preliminary findings of the credit file review in the AQR should not be communicated to banks for inclusion in the stress test as they will not be complete and will be at different stages for different banks.

Any findings from the PP&A review that have implications for the provisioning and projection of losses due to legal processes should have already been communicated to banks so that they can be taken into account in the stress test.

Material findings relating to derivative pricing models identified in the AQR should be communicated to banks using the comprehensive approach for market risk so that they can be taken into account in the projection of gains and losses. The impact of the findings on the December 2013 position should not be communicated (so that it does not create issues with respect to the Market Abuse Directive).The impacts should therefore be forward-looking only, and not impact the December 2013 CET1 ratio.

Similarly, findings relating to CVA identified in the AQR should be communicated to banks using the comprehensive approach for market risk so that they can be taken into account in the projection of gains and losses. The impact of the finding on the December 2013 position should not be communicated (so that it does not create issues with respect to the Market Abuse Directive).The impacts should therefore be forward-looking only, and not impact the December 2013 CET1 ratio.

In cases where issues have been highlighted in relation to deconsolidation or consolidation of assets, the bank should be informed of these so that the baseline and adverse scenario of the stress test is performed on an appropriate prudential perimeter.

2.3.2 CHANGE IN FAIR VALUE CLASSIFICATION

Changes in the fair value classification (e.g. HTM vs. AFS vs. fair value) were identified for some banks in the PP&A review of the AQR. These changes have been identified and confirmed in sufficient time for banks to include them in the stress test.

In order to effect the change, the bank should make the following adjustments:

1 Adjust the December 2013 CET1% to take account of the reclassification of the assets (taking into account the impact on the P&L, AFS reserve, tax/DTA, RWA).

2 Incorporate the relevant assets in the projections in the baseline and adverse scenario for 2014, 2015 and 2016 as part of the stress test.

NCAs should obtain reasonable assurance during the QA process that, in cases where a change in classification is identified, the appropriate adjustment is made. The ECB will also make sure it is confident that this has been done appropriately in key cases.

As the reclassification will be included by the bank in its stress test and in the calculation of the December 2013 CET1 ratio, there is no need to include it in the AQR-adjusted CET1 calculation.

2.3.3 DIV FINDINGS ON ASSET SEGMENT

NCAs should only communicate DIV findings relating to asset segment misclassifications to banks during the course of the comprehensive assessment. For instance, if the DIV has highlighted that the bank classifies CRE exposures as corporate, the bank should be informed and told to ensure that this is considered in the stress test. This is to ensure that macroeconomic sensitivities in the stress test are applied appropriately to assets that may have been misclassified. Other findings of the DIV work block should not be communicated.

The key misclassifications to consider are:

- any segment that should be reclassified as real estate-related;
- any segment that should be reclassified as shipping or aviation;
- any segment that should be reclassified as retail mortgage.
- If the bank differentiates parameters between owner occupier and buy-to-let mortgages, this should be considered.

If the credit file review highlights similar asset segment issues, these cannot be included in the stress test in time. Some banks may have completed the credit file review results in time, though this is very much dependent on the pace of the exercise for that bank, and therefore including the findings would lead to inconsistencies across banks. Instead, these findings should be considered during the QA of the bank's stress test results, subject to a materiality threshold.

For the avoidance of doubt, the correction of asset segment misclassifications should have no direct impact on the December 2013 available capital. Furthermore, as changes to accounting metrics are not being communicated as part of this exercise this is expected to have no consequences for market disclosure by the banks. Findings could have an impact on RWA, but – based on the level of adjustments in the DIV process found – this is considered to be of secondary importance.

2.3.4 LEGAL COSTS

Where the PP&A review has highlighted any issues in relation to legal costs the bank should have already been informed and instructed to take this into account in the projections of the stress test.

2.3.5 DERIVATIVES STRESS (FORWARD LOOKING ONLY, NOT STARTING POINT CET1%) – COMPREHENSIVE APPROACH BANKS ONLY

Material adjustments resulting from the level 3 fair value exposures review of derivative pricing models should have an impact on the forward-looking derivatives projections of the bank, both directly through market value adjustments and also through the implications for fair value reserves (which explicitly need to be stressed in accordance with the EBA methodology).

Given the non-linear nature of the relationship between risk factors and the valuation of derivative positions of the bank, it is not feasible to perform any join-up calculation on a centrally-led basis for derivatives. As a result, where adjustments are material, the join-up for derivatives needs to be bank-led. The materiality threshold is introduced to avoid banks needing to resubmit stress test numbers for immaterial changes to models. The adjustments made by the banks should be quality assured in line with the description in Section 1.

All issues with derivative pricing models highlighted by the AQR should be communicated to the banks applying the comprehensive approach. The bank should be asked to assess the impact of the issue on the forward looking projection of gains/losses for the trading book and include this in its stress test submissions (both baseline and adverse). For the avoidance of doubt – the bank should not be informed of the AQR quantification of the impact – only the nature of the issue to avoid issues with the Market Abuse Directive.

The bank should be required to provide to the NCA the impact on the baseline and adverse scenario of each issue identified, and if material to allow for QA. The bank should provide an appropriate justification of the impact of the issue identified.

2.3.6 CVA STRESS (FORWARD-LOOKING ONLY, NOT STARTING POINT CET1%) – COMPREHENSIVE APPROACH BANKS ONLY

In the EBA methodology, CVA is stressed via haircuts provided in the scenario to the MtM values (after the application of the market risk shocks) of OTC derivatives. These haircuts are fixed and will not be affected by the outcomes of the CVA review within the AQR.

Therefore, the only impact of the AQR on the CVA stress test will be through adjustments made to the MtM values of derivatives from the AQR, to which the haircut will then be applied.

Therefore, in line with the adjustment methodology for derivatives, banks applying the comprehensive approach will be required to estimate the impact on the CVA stress of adjustments to the values of derivative positions as a result of the AQR, i.e.

$$CVAStress_{Delta} = MtM_{DeltaDerivatives} \times CVAHaircut$$

where $MtM_{DeltaDerivatives}$ is the change in mark to market for derivatives positions resulting from the AQR, and CVAHaircut is the relevant haircut required in the stress test.

2.3.7 DECONSOLIDATION/RECONSOLIDATION

During the PP&A process, a number of cases were highlighted where securitised portfolios had been deconsolidated from the prudential perimeter but not from the accounting perimeter. If, in these cases, the NCA has decided that the portfolio should be consolidated in the prudential perimeter, banks should be informed that the portfolios should be reconsolidated for prudential purposes for the purposes of both the baseline and adverse scenario of the stress test. This means that the underlying exposures within the SPV should be stressed in line with the rules of the stress test for the relevant exposure type. This should be included by the bank in its stress test and in the calculation of the December 2013 CET1 ratio. It is therefore not required to be included in the AQR-adjusted CET1 calculation and therefore the stress test join-up.

The NCA bank team should obtain reasonable assurance that the underlying exposures of the SPV have been included on a consolidated basis. In doing so they should be able to state the impact on the December 2013 CET1 ratio and the forward-looking projection of the capital position of the bank.

In the event that the NCA cannot obtain reasonable assurance that this has been dealt with, a QA issue should be highlighted and a centrally-led adjustment made by assuming a simple haircut, for example in the case of the underlying exposures being securitisations that all the securitisations in the special purpose vehicle (SPV) should be deducted from available capital.

2.4 TRANSLATION OF QA FINDINGS AND JOIN-UP INTO IMPACTS ON CET1% PROJECTION

Once relevant line items have been adjusted due to join-up and QA, they need to be translated into a projection of CET1%. This requires a number of assumptions on how the adjustments to

relevant line items impact other line items, including impacts on RWA, DTAs and risk transfer schemes.

Once the impact of join-up on relevant line items and any centrally-led QA adjustments is complete, they will need to be translated into impacts on the projected CET1% ratio.

The following assumptions will be made for the purposes of the exercise:

- There will be no adjustments made to RWA or IRB provisioning shortfall for adjustments made to P&L items or reserves.
- Tax effects on P&L line items will be taken into account, though will be limited in line with the CRR rules on DTA usage in capital.

2.4.1 RWA AND IRB PROVISIONING SHORTFALL

The join-up calculation and QA processes focus on ensuring that the P&L impacts of the stress test are accurately reflected. However adjustments of this sort could have a number of indirect impacts on the RWA and IRB provisioning shortfall calculation.

An increase in the volume of defaulted assets can lead to a change in RWA requirements in some circumstances, depending on the level of provisioning applied to the reclassified assets and the calculation approach the bank uses (Standardised Approach (STA), Foundation Internal Rating Based Approach (F-IRB), Advanced Internal Rating Based Approach (A-IRB)).

The IRB provisioning shortfall can change depending on the calculation approach the bank uses (A-IRB or F-IRB) and the level of provisioning vs. EL and/or $EL_{\text{Best Estimate}}$.

The impacts are of second order, and as such are ignored for the purposes of join-up and QA adjustment processes in the comprehensive assessment. That is, no adjustment is made to RWA or the IRB provisioning shortfall as a result of the join-up or QA process. This is the same assumption as was made in the AQR (see p. 291 of the AQR manual).

If this assumption were not to be applied, the level of data required to carry out the join-up and QA adjustment process would be dramatically increased which is neither feasible in the time frame, nor worthwhile considering the second-order impact. Nevertheless, if an NCA can demonstrate using granular bottom-up data that explicitly address the full working mechanics of the CRR that this assumption leads to a material distortion in the capital ratio of the bank then they may propose an adjustment to the capital impact of the comprehensive assessment.

For the avoidance of doubt:

- Given the complexities involved the ECB will make no provision in the infrastructure for the join-up to make adjustments to the IRB provisioning shortfall or RWA. If an NCA proposes to make such an adjustment, it would need to make the adjustment itself, including adjusting the relevant EBA transparency templates;

- If the ECB identifies any aspect of the CRR rules that is missing in the NCA analysis, the proposed adjustment may be discounted, either in whole or in part at the discretion of the ECB.

Aspects that would need to be considered if an adjustment is to be proposed would include (but not be limited to):

- Full correction of all RWA and EL parameters for findings from the AQR including segment misclassifications, collateral revaluations, data quality, data timeliness, etc.;

- Adjustment to PD and LGD model calibrations (in light of implications of misclassifications for model calibration and validation);

- Implications of movement of exposure between performing and non-performing for the IRB provisioning shortfall calculation (given shortfall has to be calculated separately on defaulted and non-defaulted assets);

- Separation of provisions relating to assets held under the standardised approach when assessing IRB provisioning shortfalls;

- Full modelling of RWA on defaulted assets (including consideration of the relationship between LGD and EL best estimate for IRBA portfolios);

- Full consideration of phase in of full deduction of IRB provisioning shortfall from CET1 capital.

Consideration of changes in RWA on defaulted standardised assets for misclassification and provisioning levels.

2.4.2 TAX EFFECTS

In the AQR and stress test results current and deferred tax effects will be incorporated including limits on the eligibility of deferred tax assets (DTAs) as CET1. Any further adjustments to P&L line items that are made because of join-up or QA will be assumed to attract a tax effect. The tax

effect will either be a reduction of the bank's current tax liabilities[20] (i.e. if the bank was paying tax in 2013) or an increase in net DTA.[21]

DTAs in AQR and stress test results

The AQR and stress test results incorporate limits on the eligibility of DTAs as CET1. These DTAs fall into three categories, each with their own limitations:

1 DTAs that rely on future profitability and do not arise from temporary differences:

- Existing stock and newly created DTAs need to be deducted from CET1 as per the phase-in stipulated in the CRR; the residual amount of the DTAs will not be deducted. National discretion for phase-in treatment (that is in place as of 1st January 2014) is allowed;
- In addition, the capacity of the bank to create future profits will affect both existing stock and newly created DTAs, i.e. if the results of the comprehensive assessment are seen to make future profits of the bank less likely this is expected to lead to a reduction of the DTA stock, leading to an additional P&L impact;
- The AQR results include the NCA bank team's estimate of the limit of the eligibility of these DTAs, given that expected future profitability and bank-driven stress test results are required to include limitations for the same reason.

2 DTAs that rely on future profitability and arise from temporary differences:

- CRR places thresholds upon the eligibility of these DTAs of
  - 10% of CET1% (net of prudential adjustments and all other deductions);
  - 15% of CET1% (net of prudential adjustments and including all other deductions) during the period from 1 January 2014 to 31 December 2017;
  - 17.65% of residual CET1% (after applying the adjustments and deductions in Articles 32 to 36 of the CRR in full)[22] from 1 January 2018 onwards.
- Newly created DTAs can have a tax effect as long as the bank still has the capacity to recognise them, i.e. as long as the new DTAs are not in excess of the CRR CET1

[20] Reduction of a bank's current tax liabilities: In case a loss recognised for a particular asset under the applicable accounting framework (e.g. IFRS) also reduces the asset's tax base in the same period.

[21] Increase in net DTAs: In case a loss recognised for a particular asset under the applicable accounting framework (e.g. IFRS) does not affect the asset's tax base in the same period.

[22] In other words, residual CET1 includes required deductions of DTAs that arise from temporary differences and significant investments in financial sector entities (CRR, Article 48: Threshold exemptions from deduction from CET1 items).

thresholds. Amounts in excess of the thresholds need to be deducted from CET1 as per the phase-in stipulated in the CRR; the residual amount of the DTAs shall not be deducted. National discretion for phase-in treatment (that is in place as of 1st January 2014) is allowed;

- The AQR results include the NCA bank team's estimate of the limit of the eligibility of these DTAs given future profitability and CRR thresholds and bank driven stress test results are required to include limitations for the same reason.

3 DTAs that do not rely on future profitability:

- These DTAs (see Article 39 of the CRR) do not have to be deducted from CET1 and thus have a full tax effect.

New DTAs arising from the AQR are expected to be those "arising from temporary differences" (which either do or do not rely on future profitability) because it is assumed that new provisions will not change the tax balance sheet in the absence of objective tax indicators/criteria.

New DTAs arising from the stress test (except when they met the criteria provided by Article 39 of the CRR) are expected to be those relying on future profitability, which either do or do not arising from temporary differences, since the objective tax criteria are expected to change over the stress test time horizon.

DTAs not relying on future profitability are those that meet the criteria of Article 39(2) of the CRR.

Size of the tax effect arising as a result of stress test join-up or QA

The size of the tax effect arising from stress test join-up adjustments or QA will be assumed to be directly proportional to that included in the T9 template for AQR portfolios and in the relevant stress test template for other portfolios.

Applicability of DTAs arising as a result of stress test join-up or QA

Where additional DTAs are created as a result of the stress test join-up or QA they will be assumed to be DTAs reliant upon future profitability (which either do or do not arise from temporary differences). A comparison will be made against projected profitability following join-up and QA and the impact on DTA stocks.

NCAs will need to indicate portfolios where no upper limit should be applied to DTAs because of government guarantees, i.e. DTAs that are likely to fall under category (3). However this will necessitate an approximation that the scope for tax effects can be aligned with the allocation of

assets to countries in the relevant AQR and stress test templates. For instance if a bank in country X has a loan to a domestic corporate booked in a legal entity in country Y, there may not be a guarantee of the associated DTA from the state in country X, nevertheless, given the complexities in aligning where the comprehensive assessment assumes losses will occur vs. the relevant tax treatment, a simplifying assumption is required.

2.4.3 CALCULATION OF THE CAPITAL SHORTFALL

Once these adjustments are made, the capital shortfall can be calculated with respect to the CET1 ratio. The shortfall calculation is then based on the three thresholds:

- AQR: 8% CET1 on the AQR adjusted 2013 balance sheet (using national discretionary definitions of CET1 under CRD IV/CRR and national discretion for the phasing-in of deductions from CET1 integrated with a common approach for the application of prudential filters for sovereign assets in the AFS portfolio);

- Stress test – baseline: 8% CET1 on the AQR adjusted baseline 2014 - 2016 year-end balance sheets (using national discretionary definitions of CET1 under CRD IV/CRR and national discretion for the phasing-in of deductions from CET1 integrated with a common approach for the application of prudential filters for sovereign assets in the AFS portfolio);

- Stress test – adverse: 5.5% CET1 on the AQR adjusted adverse 2014-2016 year-end balance sheets (using national discretionary definitions of CET1 under CRD IV/CRR and national discretion for the phasing-in of deductions from CET1 integrated with a common approach for the application of prudential filters for sovereign assets in the AFS portfolio).

The results of these tests will be displayed in the disclosure template. The final joined-up results will be available for both the baseline and adverse scenario of the stress test.