



BANK OF ENGLAND

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# Stress testing the UK banking system: guidance on the traded risk methodology for participating banks and building societies



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# 1 Overview

## 1.1 Introduction

This document describes the approach that banks and building societies (hereinafter 'banks') are expected to take in the execution of the 2016 Bank of England (hereinafter 'Bank')<sup>(1)</sup> concurrent stress test of the UK banking system with respect to trading positions.<sup>(2)</sup>

This document is intended to be used primarily by banks' risk managers and other officers who will execute the traded risk stress test, as well as by other interested finance professionals, and should be read in conjunction with:

- Several other documents published on 29 March, which together describe the 2016 macro stress scenario and provide high-level guidance regarding the execution of the stress test;<sup>(3)</sup>
- The traded risk stress scenario published on 12 April 2016;<sup>(4)</sup>
- The traded risk stress-test submission templates (hereinafter 'templates') and associated guidance already communicated to banks.

More specifically, this document:

- Describes the overall approach that banks should adopt in the execution of the traded risk stress test;
- Describes how the stress and baseline scenarios<sup>(5)</sup> should be translated into the specific loss numbers<sup>(6)</sup> and financial and regulatory metrics reported via the templates;
- Defines certain important terms and concepts that are used in the templates in the context of the methodology that should be applied.

The document does not concern itself with the specifics of the baseline and stress scenarios themselves, which are described in the documents noted at footnotes (3) and (4).

The traded risk stress-test methodology outlined in this document requires banks to exercise judgement in the application of the method to their exposures. An example of such judgement is banks' assessment of the likely time period over which a material, illiquid trading position could be liquidated or hedged under the stress scenario. We expect banks to carefully explain the basis of key judgements that they have made. Moreover, banks' judgements will be subject to rigorous challenge from the Bank.

## 1.2 Key design features

The Bank's approach to stress-testing traded risk is similar to the approach taken in the 2015 stress test. The Bank's

innovations in the 2015 traded risk stress-test were inspired by what happened in real stress events (especially in the crisis that followed the Lehman default) and by a desire to create a link to the forward-looking macro scenario. It was intended to impart a greater sense of realism to the stress test.

For 2016 the traded risk stress scenario continues to be linked to the macroeconomic aspects of the scenario. The market risk factor shocks are broadly aligned to the global and regional impacts of the macro scenario. This year, reflecting the Annual Cyclical Scenario framework, the calibration of the shocks has also taken into account the severity associated with the state of the financial cycle.

The Bank's approach continues to recognise the importance of market and position liquidity when assessing the losses likely to be sustained under a stress scenario. Banks are expected to apply risk factor shocks of a size that corresponds to the likely liquidity of each position under the stress scenario, and hence to the likely time for which each position is exposed to the scenario.

Finally, the Bank's approach to counterparty credit risk asks banks to identify and default counterparties that are particularly vulnerable to the stress scenario. This approach creates consistency between the counterparty credit risk losses and the macro stress scenario. The overall approach to ranking and defaulting counterparties is similar to last year, but the precise number and regional distribution of the defaults is expected to vary to align to the precise nature of the 2016 stress scenario. Further details on the counterparty default approach for this year are provided in Section 5.

(1) Unless otherwise stated, references in this document to the Bank or Bank of England include the Prudential Regulation Authority.

(2) Throughout this document, the term 'traded risk stress test' refers to the part of the Bank 2016 stress test that captures traded risk positions; similarly, 'market risk stress test' (or similar) refers to a particular component (or components) of the traded risk stress test.

(3) These documents are: 'Stress testing the UK banking system: key elements of the 2016 stress test' (hereinafter 'Key elements of the 2016 stress test'); 'Stress testing the UK banking system: guidance for participating banks and building societies' (hereinafter 'Guidance for participating banks and building societies'); and 'Stress testing the UK banking system: variable paths for the 2016 stress test' hereinafter 'Variable paths for the 2016 stress test'.

(4) The traded risk stress scenario comprises the shocks to be applied to a set of market risk factors (the various market rates and prices that drive the valuation of traded risk positions), at different time horizons, and is described in the 'Traded risk shocks' tab of 'Stress testing the UK banking system: traded risk and structured finance scenario for the 2016 stress test' (hereinafter 'Traded risk and structured finance scenario for the 2016 stress test'). This document will be published on the Bank's website on 12 April 2016. The macro stress scenario (described in the documents referred to in the previous bullet point) comprises mainly the paths of macroeconomic variables such as GDP, unemployment, etc; however, the paths of a small number of key market risk factors are also included (for example, short-term interest rates, long-term interest rates, equity indices).

(5) Throughout this document, reference is made to stress and baseline 'scenarios'. Unless otherwise stated, the term 'scenario' refers to both the macro stress scenario and its narrative description, published in 'Key elements of the 2016 stress test'; and 'Variable paths for the 2016 stress test' on 29 March 2016, and the market risk factor shocks published in the 'Traded risk shocks' tab of the 'Traded risk and structured finance scenario for the 2016 stress test' on 29 March 2016.

(6) The outcome of the traded risk stress test or of a particular component of the stress test is often referred to as a loss. However, it is recognised that the outcome of some components of the stress test may, in fact, result in profits.

## 2 Preliminaries

Prior to describing the traded risk stress-test methodology and its components, it is helpful to describe both its scope of application and how the different components of the stress test fit together, and to set out several general features of the stress test.

### 2.1 Position scope

Broadly the scope of positions to which the traded risk stress test is applied is: all Fair Value Through Profit and Loss ('FVTPL')<sup>(1)</sup> and Available For Sale ('AFS') accounted positions.

This scope comprises three parts of a bank's balance sheet:

- The regulatory Trading Book, which banks use for their client-servicing and other trading activities;
- The AFS part of the regulatory Banking Book, which largely comprises banks' Liquid Asset Buffers (LABs), and associated hedge positions;
- The FVO part of the regulatory Banking Book, which is typically smaller than both the Trading Book and the AFS part of the Banking Book, and associated hedge positions.

Further details, including refinements and exceptions to this definition of scope, are provided in Annex A.

### 2.2 Components of the stress test

The traded risk stress scenario will have an impact on both capital resources (which would be depleted in the event of losses) and capital requirements (which may increase in response to rises in market volatility and counterparty default risk).

The impact of the traded risk stress test on capital resources is calculated to take into account the separate impacts arising from:

- Market risk losses (described in Section 3) arising in the Trading Book due to adverse moves in risk factors (market prices and rates) and issuer default;
- Changes in various valuation adjustments (described in Sections 3 and 4), including Funding Fair Value Adjustments (FFVA), Credit Valuation Adjustment (CVA) and the Prudent Valuation Adjustment (PVA);
- Counterparty credit risk default losses (described in Section 5);
- Revenue and cost changes in the bank's investment banking business (described in Section 6);

- AFS and FVO losses (described in Section 7).

The impact of the traded risk stress test on capital requirements is calculated as the sum of the separate impacts from:

- Market risk and CVA risk-weighted assets (RWAs) (described in Section 8);
- Counterparty credit risk RWAs (described in Section 8).

The overall impact on a bank's capital ratios will reflect the impact of the traded risk stress test on both capital resources and capital requirements.

### 2.3 Effective date

The stress test must be applied to banks' trading positions as of a specified effective date. The effective date for running the stress test is different for different components of the traded risk stress test (and hence for the corresponding templates), as indicated in the table below.

Structured template <sup>(a)</sup>	Position scope	Effective date
Revenues & Costs for Investment Banking Divisions (Baseline and Stressed) template	All investment banking business	31 Dec. 2015
Market Risk Stressed P&L template	All Trading Book (see Annex A for clarifications and exceptions)	19 Feb. 2016
Counterparty Credit Risk Losses template	All Trading Book and Banking Book	19 Feb. 2016
AFS FVO Gains and Losses template	AFS, FVO and all hedges (see Annex A for clarifications and exceptions)	31 Dec. 2015
Stressed PVA template	All FVTPL positions	31 Dec. 2015
Market Risk and CVA RWA template Counterparty Credit Risk RWAs template	All Trading Book (and Banking Book for counterparty credit risk and CVA only)	31 Dec. 2015

(a) The Reconciliation template is omitted from this table, as it spans across the templates (and hence the effective dates) enumerated in the table above.

An effective date of 19 February 2016 was chosen for market risk and counterparty credit risk exposures because banks typically reduce their traded positions at year-end. Using positions as at 31 December 2015 would, therefore, be unlikely to yield a representative stress-test result. Using instead the 19 February 2016 effective date is more likely to provide a representative snapshot of banks' traded risk positions.

(1) Including positions accounted for under the Fair Value Option (FVO).

## 2.4 Reporting currency

Banks have trading positions that would generate P&L under the stress scenario in currencies other than their reporting currency. Such P&L should be translated into the bank's reporting currency via FX spot rates that are consistent with:

- The stress scenario;
- The liquidity (and hence the liquidation horizons) of the positions that generate the P&L, which will determine the time at which the foreign currency P&L is generated and the rate at which it is to be translated into the reporting currency.

## 2.5 Loss allocation

The overall stress-test horizon is five years and, in line with this, banks should model the impact on their AFS and FVO positions, and the impact on PVA for positions held in the Banking Book, for each year of the five-year stress scenario (further details on this are provided in the relevant sections of this document). However, in respect of market risk, CVA movements, PVA movements on Trading Book positions and counterparty credit defaults, banks should assume that all losses are incurred in the first year of the stress scenario. There are two reasons for this: firstly, losses on trading activities would typically be concentrated in the early part of a stress scenario, since market prices tend to discount bad news fairly rapidly; secondly, allocation of losses over the five year horizon would require the creation of five-year paths for the thousands of market risk factors that drive trading P&L, and the costs of doing this are expected to outweigh any benefits.

The allocation of losses over the five years of the stress scenario is summarised in the table below.

Losses	2016	2017	2018	2019	2020
Market risk	100%	0%	0%	0%	0%
CVA	100%	0%	0%	0%	0%
Counterparty default	100%	0%	0%	0%	0%
PVA (Trading Book)	100%	0%	0%	0%	0%
PVA (Banking Book)	Gains/losses on these positions to be calculated in each year of the stress scenario.				
AFS and FVO	Gains/losses on these positions to be calculated in each year of the stress scenario.				

Having reviewed at a high level the Bank's approach to the traded risk stress test, its application via the key components of capital resources and capital requirements is now described in more detail in the following sections of this paper.

## 3 Market risk stress

### 3.1 Position types

Banks' Trading Books comprise trading positions of varying liquidity. As was apparent in the financial crisis, the most illiquid positions can inflict the greatest damage to banks' P&L and capital resources. For this reason, banks are expected to clearly identify illiquid positions and distinguish them from liquid positions.

For the purpose of the traded risk stress test, we request that banks classify Trading Book positions into three categories:

Liquids, Structural Liquids and Illiquids:

- Liquid positions are defined to be those which would take two weeks or less to liquidate or hedge under the stress scenario;
- Illiquid positions are defined to be those that would take more than two weeks to liquidate or hedge under the stress scenario;
- Structural Liquids is a further designated position type and is intended to capture positions which, although possibly reduced or neutralised when an adverse stress scenario has its initial impact, may need to be subsequently reopened in order to preserve a bank's ability to provide financial products in a particular market. Market-making positions epitomise this type of position. By virtue of reopening such a position, a bank exposes itself to further losses associated with further adverse market moves.

Stresses applied to Structural Liquids and Illiquids are incremental to the Liquids stress test.

### 3.2 Assessment of position liquidity

Banks are expected to make their own assessments of the liquidity horizons of their positions. General guidance on the degree of market liquidity that characterises the stress scenario is provided in the document 'Key elements of the 2016 stress test' published on 29 March 2016. More specifically, banks should judge how quickly they would be able to exit positions in view of likely market trade volumes under the stress scenario; however, banks should not assume a liquidity horizon shorter than one day. The Bank will carefully assess banks' judgements regarding the liquidity of their traded positions.

### 3.3 Calibration of risk factor shocks

The risk factor shocks that comprise the traded risk scenario are included in 'Variable paths for the 2016 stress test' published on 29 March 2016 and in the 'Traded risk shocks' tab of the 'Traded risk and structured finance scenario for the 2016 stress test' which will be published on 12 April 2016.

Conceptually, the Bank is specifying a core set of risk factor shocks that are intended to induce an overall shock to the entire set of in-scope positions. The Bank has specified a number of key risk factor shocks in each material geography and market to provide a secure foundation for the elaboration of the stress scenario in terms of all risk factors that would drive banks' P&L. Moreover, risk factor shocks are specified for a range of different liquidity horizons.

However, the risk factor shocks provided by the Bank are unlikely to include all risk factors to which banks are exposed, and so banks are expected to identify other risk factors that would contribute to their P&L under the stress scenario and to calibrate shocks for these risk factors. These risk factors should be identified based on banks' understanding of the material risk factors that would be expected to drive P&L under the stress scenario. Further, these additional risk factor shocks should be calibrated with reference to the risk factor shocks and scenario narrative that have been provided by the Bank. If this proves insufficient, banks should gauge the severity of shocks applied to these factors with reference to the worst market moves observed in the historical periods per region detailed in the table below.

Geographical region of positions	Historical period
Asia and Emerging Markets	2008 H2
Europe excluding United Kingdom	2011 H2
United Kingdom	2008 H2
United States	2008 H2
FX (globally)	2015 H2

For this year's scenario the FX asset class behaves sufficiently differently that we have provided a separate reference period in respect of it; this overrides the other periods in the table and applies globally to that asset class.

Daily, two-weekly and monthly shocks can be directly sampled from these half-year periods and the worst identified. To identify the worst yearly shock, banks should calculate the yearly shock as at each day of the specified half-year period, by subtracting the value on the given day from its value one year prior, and then choose the worst such shock from this set.

Whether market risk factor shocks are provided by the Bank or identified and calibrated by banks themselves, banks should apply the shocks appropriate to the liquidity of each position. The Bank will assess the appropriateness of the shocks that banks apply to their traded positions.

### 3.4 Issuer default

The 'Market Risk Stressed P&L' template includes a cell relating to 'Issuer Default' losses. Such losses would be associated with those counterparties identified as defaulting in the counterparty credit risk stress described in Section 5.<sup>(1)</sup>

That is, if a counterparty were to default under the counterparty credit risk stress, then any issuer exposure to that name arising in the Trading Book (from bonds, equities, traded loans, and derivatives where the defaulting counterparty is referenced as an issuer, eg credit default swaps (CDSs)) should also assume default and be reported in the 'Market Risk Stressed P&L' template.

### 3.5 Funding cost

The stress scenario will impact a bank's own cost of funding and should induce a funding loss, to the extent that funding costs are partly or wholly reflected in the bank's mark-to-market accounting. Banks should ensure that this funding loss is included in the 'Market Risk Stressed P&L' template. To determine the loss, the bank should estimate its stressed funding curve in line with the overall narrative and severity of the macro scenario and consistently with the assumptions it has made for the banking book. This stressed funding curve should then be used to determine any fair values that are a function of it, in line with banks' existing valuation methodologies.

To the extent that there is also a PVA against funding costs (specifically, the Investment and Funding Cost component of PVA), then there may be additional capital erosion due to changes in PVA under the stress scenario. This additional PVA amount should be calculated according to banks' existing methodologies and reported in the 'Stressed PVA template'. Further details are provided in Section 4.3.

The remaining parts of this section describe in more detail the approach that banks are expected to take in the calculation of loss per position type.

### 3.6 Liquids stress

Having identified all the risk factors that drive the P&L of liquid portfolios, banks should apply the risk shock (whether supplied by the Bank or calculated by the banks themselves) appropriate to the liquidity of each risk factor and thereby obtain the total loss generated by liquid portfolios under the stress scenario. This is to be reported in the 'Liquids' column of the 'Totals' tab in the 'Market Risk Stressed P&L' template. The total loss should be disaggregated and reported at the level of granularity specified in the template, which is by overall asset class (equity, interest rates, etc).

The Bank recognises that some banks currently submit the Firm Data Submission Framework (FDSF) market risk template. This template is designed to provide the P&L impacts of a wide range of pre-defined market risk factor shocks and, therefore, it is likely that some of these P&L impacts could be useful in calculating the outcome of the

(1) Counterparty credit default losses should be reported via the 'Counterparty Credit Risk Losses' template.

2016 stress test (ie where the pre-defined risk factor shocks of the FDSF template equal — or approximate — the corresponding shocks specified in the 2016 stress scenario). In Annex B further guidance is provided to banks regarding the possible use of the data submitted via the FDSF market risk template.

### 3.7 Structural liquids stress

Structural Liquids positions may suffer a loss at the onset of a stressed market environment. This is likely to cause a bank to reduce its inventory in the associated products. However, for the franchise reasons noted in Section 3.1, such positions may be reopened and thereby expose the bank to further losses associated with adverse market moves later in the stress scenario. Banks are expected to take due account of the nature of this exposure in calculating the loss sustained by structural liquid positions under the stress scenario. Specifically, banks are expected to apply the following approach:

- Banks should identify desks or position types that are significant for strategic reasons, eg they require a minimum level of inventory in order to maintain a credible market-making franchise. This could, for example, be a bond or swaps market-making desk whose relative standing in the market (as indicated by rankings or otherwise) needs to be preserved;
  - For each such desk or position type, and the risk factors they are exposed to, banks should identify the risk factor that typically has the greatest market risk and identify a typical level of exposure to it. This may coincide with the value as of the effective date or might instead be a representative trailing average calculated as of the effective date;
  - The loss should be calculated by applying the risk factor one year shock to this typical size and adding together the losses from each of the structural liquids identified. Note that the one year shock is not to be downscaled to account for the proportion of the shock already suffered in the Liquids stress (eg if the risk factor has a one day liquidity horizon and the one day shock is 20%, with the one year shock being 30%, the Structural Liquids shock to be applied is 30%). The rationale for this is that the overall size of the one year shock is used as a proxy measure to capture the effect of multiple repeat losses and also to account for any significant deviations in inventory size away from the typical size.
- Positions that are difficult to value and consequently may have significant non-modelled characteristics that are not captured in the stressed value eg legal enforceability risk, rating downgrade contingencies;
  - Positions for which values may be modelled, but with significant uncertainty;
  - Positions for which there are only thin or one-way hedging markets available, and so the ability to ascribe a liquidity horizon to the position may be compromised;
  - Positions that would take longer than two weeks to liquidate or hedge fully, whether complex or not. This could, for example, include a corporate bond held in large size relative to the amount of the bond in issue.

Banks should articulate their approach to calculation of the Illiquids stress-test loss in sufficient detail to put the Bank in a position to understand, in respect of each illiquid portfolio:

- The nature of the positions that comprise the portfolio;
- The risk factors that drive portfolio P&L;
- The risk factor shocks utilised (and how they were calibrated);
- The details of the stress loss calculation applied;
- The loss outcome itself; and
- Which trading desk manages the portfolio.

In identifying the risk factors that drive P&L of illiquid portfolios and in calibrating the corresponding risk factor shocks, banks should take due account of:

- The risk factor shocks and scenario narrative published by the Bank;<sup>(1)</sup>
- The market structure and dynamics for the products that comprise the illiquid positions. Specifically, banks are expected to take due account of the fact that illiquid product valuations are heavily influenced by other broker-dealer activity, and to reference the market dynamics in the historical calibration periods given in the table in Section 3.3.

### 3.8 Illiquids stress

The loss sustained by each portfolio of illiquid positions should be identified separately and reported in the Illiquids column of the 'Totals' tab in the 'Market Risk Stressed P&L' template. For guidance purposes, examples of illiquid positions are provided as follows:

(1) As described in the documents 'Key elements of the 2016 stress test', 'Variable paths for the 2016 stress test', and the 'Traded risk shocks' tab of 'Traded risk and structured finance scenario for the 2016 stress test'.

## 4 Valuation adjustments

Banks' valuations of their fair value positions are subject to various adjustments. It is likely that these valuation adjustments will be impacted by the traded risk stress scenario, and so the following sections provide guidance to banks on how these adjustments should be modified under the stress scenario.

### 4.1 Credit Valuation Adjustment (CVA)

In their trading activities banks enter into derivative contracts with counterparties. If a derivative contract gives rise to credit exposure for a bank — in other words, the contract has produced or is predicted to produce a mark-to-market profit for the bank — then there is a risk that the counterparty will default and fail to pay what is owed under the contract. The Credit Valuation Adjustment measures the negative adjustment to the contract's value today in order to take account of this risk of default by the counterparty. Under the traded risk stress scenario, credit quality will deteriorate for some counterparties and credit spreads will widen and so the CVA should be modified to reflect this and other aspects of the stress scenario.

CVA should be reported in two traded risk templates, with consistency required between the entries:

- The 'Counterparty Credit Risk Losses' template should show CVA before and after the application of the risk factor shocks and exclusive and inclusive of all associated hedges (credit and market risk hedges);
- The 'Market Risk Stressed P&L' template should report the CVA P&L ie the change in CVA and all associated hedges arising from the stress.

Banks are asked to note the following when calculating the CVA impact:

- When calculating the adjustment to CVA to reflect the impact of the stress scenario, banks should maintain consistency with the calculation of CVA in their accounts. Specifically, banks should use either market-implied or actual measures of Probability of Default (PD) and Loss Given Default (LGD), in line with their accounting CVA;
- Shocks to the risk factors that drive CVA should be calibrated to a one-year liquidity horizon for both CVA and the associated credit and market risk hedges in place at the effective date, regardless of the frequency of hedge-adjustment used by the CVA hedging desk;
- For collateralised counterparties, banks should assume the counterparty continues to post additional margin;

- Banks should pay particular attention to the more complex CVA risks, such as rate/credit-spread cross gamma and index/single-name proxy basis. Banks should decompose the aggregate CVA loss so that the incremental contributions of these bespoke illiquid CVA risk factor shocks are apparent;
- Banks should provide detailed commentary on the resulting CVA adjustment to support the calculations that they have made.

### 4.2 Debit Valuation Adjustment (DVA)

In symmetry with CVA, which adjusts valuations to account for the risk of counterparty default, the Debit Valuation Adjustment (DVA) adjusts valuations to reflect variations in a bank's own credit quality.

The approach that banks are expected to follow in respect of DVA under the stress test requires that any impact of DVA is not recognised. This is because regulatory capital treatment assumes that any DVA benefit cannot be realised and so any impact of DVA is not recognised in the calculation of regulatory capital resources. Nonetheless, if a bank is hedging its DVA, then any profit or loss from these fair value hedges should be included in the stress test. If such hedge P&L arises in the Trading Book, then it should be separately identified in the accompanying descriptive text. If it arises outside the Trading Book, and so is not captured by the 'Market Risk Stressed P&L' template, then it should be reported as an unstructured data submission separate to the templates and this P&L will be added to other market risk losses.

### 4.3 Prudent Valuation Adjustment (PVA)

The scope of the traded risk stress test is fair valued positions. However, fair value may fall short of what would be considered prudent in the context of regulatory capital resources. For example, when valuation of a security is subject to a large degree of uncertainty — perhaps because liquidity in the market for the security is very thin — fair value would require the security to be marked within the range of possible prices for the security, whereas prudence would require the security to be marked at a lower (upper) estimate of price if the position were long (short).

As the detailed requirements for banks to produce a PVA are a recent regulatory innovation, banks are expected to report only changes to the Investing and Funding Cost component of PVA,<sup>(1)</sup> via the 'Stressed PVA' template. This will ensure that a material impact from stressed PVA is captured. In future years, the Bank may extend the scope of the traded risk stress test to include other parts of PVA.

(1) Also known as the Investing and Funding Costs Additional Valuation Adjustment (AVA).

Note that changes to Investing and Funding Cost should be partly captured in the market risk stress, given that a bank's own cost of funding is increased in the stress scenario, and this will alter the accounting mark-to-market valuations. However, banks may be carrying PVA on the part of the Investing and Funding cost that is not currently recognised in accounting value, and the PVA stress test is intended to capture this incremental amount.

The approach for stressing funding costs is identical to that laid out in Section 3.5 and should use the same stressed funding curve. The PVA should be calculated according to banks' existing methodologies and reported in the 'Stressed PVA' template.

For Trading Book related losses (ie PVA in relation to FVTPL Trading Book positions), the resulting loss should be allocated to year one with no recovery assumed in subsequent years.

For Banking Book related losses (ie PVA in relation to AFS or FVO positions), the resulting loss should be allocated to year one, but a recovery in later years is permitted if the macro scenario indicates an improvement in funding conditions. The results for later years should be supplied via an unstructured data submission.

#### 4.4 Bid/offer reserve

Banks are expected to calculate a bid/offer reserve for inclusion in their accounts. This reserve is intended to measure the cost of exiting their positions.

Banks should assess the impact on bid/offer spreads arising from the Liquids stress, applying the level of granularity for this analysis that they would apply to their own internal analysis and using their own netting method. The historical calibration periods used to determine the bid/offer increases should be the same as the periods noted in Section 3.3. Bid/offer increases should be calculated as averages over those stressed periods for each of the regions. Other averaging, for example over unrelated periods or combining multiple periods, should not be used in order to maintain scenario consistency. The loss should be reported in the bid/offer component of the 'Market Risk Stressed P&L' template.

In addition, banks are expected to include in their assessment of specific illiquid positions any changes in bid/offer spreads and any pricing model valuation adjustments.

## 5 Counterparty risk default stress

This section discusses counterparty default loss, which comprises two parts: portfolio-wide default losses across particular cohorts of uncollateralised small and medium-sized enterprise (SME) clients, and additional losses arising from the default of specifically named, large counterparties that are

deemed to be vulnerable to default under the stress scenario. The Bank will carefully assess the appropriateness of banks' choices of which counterparties to default under the stress scenario (both in terms of the SME sector and specific names).

### 5.1 Definition of vulnerable counterparties

The selection of vulnerable counterparties requires expert judgement regarding the creditworthiness of counterparties, and banks are expected to consider multiple factors in making this determination. For example, banks should consider both the current creditworthiness of counterparties, and how that creditworthiness might deteriorate under the stress scenario. Therefore, the selection of vulnerable counterparties should not be based solely on simple application of measures such as banking book PDs (or external ratings), but should also take into account idiosyncratic credit factors arising from the stress scenario itself.

### 5.2 Portfolio default losses

Regarding portfolio losses, banks are expected to:

- Identify their most significant geographical cohort of uncollateralised SME exposure under the stress scenario.<sup>(1)</sup> The significance of a cohort should be judged in terms of both the materiality and the vulnerability of the exposure under the stress scenario;
- Estimate a cohort default loss which would arise from a portion of this portfolio defaulting at the end of the first year of the stress scenario, and with no further losses beyond the one year point. Banks should estimate this cohort default loss as follows:
  - Calculate the stressed exposures of the counterparties in the cohort by applying one-year market risk factor shocks.
  - Calculate the stressed expected loss, using the stressed PD and LGD from the Banking Book stress-test analysis. Specifically, banks should use the default rate (for PDs — using the one-year PD) and severity (for LGDs) consistent with the projection of impairments in the Banking Book.
  - Using the stressed PD implied from the cohort's stressed expected loss, estimate the proportion of pre-stress CVA that relates to the defaulted portion of the overall cohort and deduct this from the stressed expected loss to arrive at the cohort default loss.

<sup>(1)</sup> For the avoidance of doubt, the counterparty country or region allocation is to be determined using the 'ultimate risk' approach that applies to all credit exposures for this year's stress test, as described in the overall guidance document, in line with the definition of 'Country of Exposure' of the Firm Data Submission Framework Semantic Data Model.

### 5.3 Specific name default losses

Banks are also expected to default a number of specifically named, vulnerable counterparties under the stress scenario, as described in this section. The approach to determining the default loss varies according to whether a bank's exposures to a counterparty are collateralised or uncollateralised.

For uncollateralised counterparty losses, banks should:

- Estimate stressed current exposure by applying one-year market risk factor shocks and assuming the default occurs at the end of the one-year period (and with no additional losses beyond the one-year point);
- Identify and rank their top exposures under the stress scenario as detailed in the table below. Banks should rank counterparties by stressed current exposure;
- Identify and default vulnerable counterparties from these rankings according to the minimum numbers set out in the table below. A bank should default more than the minimum of counterparties if it deems that more than the minimum number is likely to default under the scenario;
- To calculate default losses, banks should use the severity rate from the Banking Book analysis to inform their choice of LGD, with appropriate consideration of the specific name being defaulted.

Geographical region of uncollateralised counterparty	Top exposures (number of counterparties to select from)	Counterparties defaulted (minimum)
Asia and emerging markets	10	2
Europe excluding United Kingdom	10	1
United Kingdom	10	1
United States	10	1

For collateralised counterparty losses, banks should:

- Assume the counterparty does not post any additional margin or honour existing margin calls that are still unpaid;
- Assess the total time to close out all the open positions for each of the counterparties, including allowance for any delays in exercising collateral rights. Depending on the strength of the collateralisation this close out period may not be the same for all counterparties;
- Apply market risk shocks to the exposures and collateral that are appropriate to the close out period identified;
- Calculate stressed current exposure for each counterparty;

- Rank the top exposures as detailed in the table below. Banks should rank their counterparties by stressed current exposure (net of stressed collateral);
- Identify and default vulnerable counterparties from these rankings according to the minimum numbers set out in the following table;

Geographical region of collateralised counterparty	Top exposures (number of counterparties to select from)	Counterparties defaulted (minimum)
Global	30	2

- Note that banks should use the severity rate from their Banking Book analysis to inform their choice of LGD, with appropriate consideration of the specific name being defaulted.

Where a counterparty is treated as having defaulted, no additional impact on the market due to the default of that name needs to be modelled, and the pre-stress CVA should be deducted from the default loss. For all counterparties chosen to default, banks should consider the impact on other templates consistent with guidance in Section 3.4 and Section 7.

## 6 Revenue and cost projections

Banks are expected to calculate baseline and stress scenario revenue and cost projections for their Investment Banking Divisions (IB), where relevant (via the 'Revenues & Costs for Investment Banking Divisions (Baseline & Stressed)' template). In addition, banks should provide analysis for the individual business lines that comprise the IB and provide a split by geographical region.

Baseline scenario income and expense projections should reflect the plausible execution of a bank's business plan. Similarly, the stress scenario income and expense projections should reflect a plausible execution of a bank's business plan under the stress scenario.

In the stress scenario, banks should assume that market volumes fall as a result of reduced economic activity. Banks should not assume an increase in revenues, as was observed in some business lines in the years following the Lehman default, and the bid/offer widening assumptions used to calculate the bid/offer stress in Section 4.4 do not apply. Neither should banks assume that there is any reduction in the aggregate investment banking sector capacity as a consequence of the stress scenario.

## 7 Available For Sale (AFS) and Fair Value Option (FVO) positions

Losses for AFS and FVO positions under the stress scenario should be calculated with respect to each of the five years of the scenario; specifically, these positions should be revalued five times, once for each year-end of the scenario.

In constructing the stress scenario to be applied to the AFS and FVO positions, banks are expected to refer to:

- The macro scenario, published in 'Key elements of the 2016 stress test'; and 'Variable paths for the 2016 stress test', which provide full five-year paths for a small number of the market risk factors relevant to AFS and FVO positions;
- The 'Traded risk shocks' tab of the 'Traded risk and structured finance scenario for the 2016 stress test', which provides more detailed risk factor shocks for the first year of the scenario, for more of the risk factors relevant to AFS and FVO positions.

Banks are expected to infer from these parts of the Bank's 2016 stress scenario the complete five-year stress scenario that should be applied to AFS and FVO positions.

Calculation of losses for the AFS and FVO positions should be conducted in two stages:

1. Banks should revalue the positions they held as at 31 December 2015 five times, once at each year-end, and thereby produce gain or loss projections for each of the five years. In calculating the valuations for each year, banks should not age nor change any of the positions. For instance, if a bank holds a ten-year gilt this position should be revalued each year-end as a ten-year gilt; it should not be revalued in year one of the stress scenario as a nine-year gilt;
2. For businesses where a bank makes material changes to the balance sheet in the stress scenario in such a way as to impinge on the AFS and FVO books, the bank should make corresponding adjustments to the gains or losses calculated under step 1. However, banks should not adjust individual positions in the AFS and FVO books.

Where banks wish to make material changes to the weightings of the constituents of their liquidity buffers, these should be identified as a management action and their impact noted via an unstructured data submission.

Where banks have in place written procedures requiring the sell down of foreign currency gains or losses from AFS/FVO positions, then banks should follow these procedures in their

stress-test calculation. This is the only type of rehedging permitted in stress-testing AFS/FVO positions.

Note the following points of clarification regarding the treatment of the default risk of AFS and FVO positions:

1. The 'Counterparty Credit Risk Losses' template only covers derivative and Security Financing Transaction (SFT) counterparty defaults, and excludes both unsecured lending and issuer defaults on bond and equity holdings. Also excluded are positions where the loan is designated at fair value under FVO. No default losses should therefore be reported in the Counterparty Credit Risk template for AFS and FVO assets. These should instead be reported in the 'Default Loss' tab of the 'AFS FVO Gains and Losses' template;
2. However, counterparty default losses on derivative hedges to AFS and FVO items should be reported in the Counterparty Credit Risk template, as this template covers all Trading Book and Banking Book derivatives;
3. Unlike market risk losses on AFS and FVO positions, which are allocated across the full five years of the stress scenario, default losses for AFS and FVO positions should be allocated to year one of the stress scenario.

For private equity investments in AFS and FVO, banks should as a starting point consider the methodologies used in their current valuation approach, for example their pre-existing choices of comparable assets (eg listed securities), and any adjustments already taken to account for the difference between the position held and a comparable listed asset. Application of the stress scenario may require approximations such as the use of betas to simplify one or more of the steps in the valuation approach, when applied under the stress scenario. Where these approximations are employed, they should be calibrated to the stressed historical reference periods identified in Section 3.3, and clearly identified in the unstructured data submission. Banks' methodology should also consider any impairments under the stress scenario.

## 8 Risk-weighted assets (RWA) projections

Banks should submit information on their starting RWAs (ie as at the effective date defined in Section 2.3) and projected RWAs under the baseline and stress scenarios for each year-end date over the time horizon via the following two structured data templates:

- 'Market Risk and CVA RWA'
- 'Counterparty Credit Risk RWAs'

The 'Market Risk and CVA RWA' template captures starting and projected capital requirements for both market risk and CVA risk, while the 'Counterparty Credit Risk RWAs' template captures starting and projected capital requirements for counterparty default risk. Other traded risk related components of RWA (eg settlement risk and large exposures) are not captured in the traded risk templates, but are captured in other templates.

### 8.1 General guidance

The starting values as at the effective date should reflect reported year-end values corresponding to the prescribed time period of the stress test. RWA projections should:

- For both the baseline and stress scenario, be consistent with the scenario as at the year-end calculation dates;
- For the stress scenario, reflect a plausible execution of a bank's business plan under the stress scenario (including the bearing of the stress scenario on a bank's ability to execute its business plans). Otherwise, the projections should reflect plausible variation to the bank's business plan, where these variations are clearly identified;

- For both the baseline and stress scenario, be consistent with balance sheet and income and expense growth assumptions. Specifically, an increase in projected balance sheet size should be reflected in an increase in RWAs. Similarly, a bank's plans to increase risk appetite should be reflected in an increase in RWAs.

### 8.2 Specific guidance

Further details of the methodology that banks are expected to apply in the production of RWA projections under the baseline and stress scenarios are provided in Annex C.

## Annex A

### Clarifications and exceptions to traded risk stress-test scope

Clarifications and exceptions to the scope of the traded risk stress test are provided below:

1. Where a position has a prudential filter that eliminates the impact of changes in its value from capital, then such positions should be omitted in line with the filtering applied in the capital treatment;
2. Securitisation positions (per the CRR Chapter 5 definition) and covered bonds are excluded from the traded risk stress test (since they are part of the credit stress test) but any non-Chapter 5 hedges to these positions should be included. For example a CLO hedged with an untranching index CDS would result in the inclusion of losses from the CLO in the credit stress test and the gains from the CDS hedge in the traded risk stress test;
3. Securities financing transactions held at amortised cost in the Banking Book should be included for the purpose of calculating counterparty default losses. This includes all collateral types, even Chapter 5 securities. For clarity, all other types of amortised cost lending are excluded, as they will be captured via the Banking Book stress test;
4. Hedges of accrual accounted loans are excluded;
5. Equity, bond, loan and pre-securitisation syndication pipelines that are FVTPL should be included, as well as all FVTPL hedges against these commitments. In this context, loan commitments refer to conditional agreements to proceed to full loan documentation, where the commitment has a fair value, but is not yet fully documented or funded. An example of equity commitment risk would be the underwriting of rights issues. Pre-securitisation syndication pipeline refers to whole loans warehousing, gestation repo, or other pre-issuance activity where the associated exposure is FVTPL and not subject to amortised cost accounting; if accounted for at amortised cost, then the exposures should be excluded. Where the activity described in this point is in the Trading Book, it should be included in the 'Market Risk Stressed P&L' template. Where the exposure is FVTPL but in the Banking Book, and does not fit into one of the templates, then it should be reported as an unstructured data item supplementary to the templates.

## Annex B

### Guidance regarding possible use of the FDSF market risk template

Banks may find the FDSF market risk template for February 2016 useful in providing part of the market risk loss figure that is generated under the stress scenario.<sup>(1)</sup> However, if banks elect to use the template, they should be able to demonstrate that the figures used provide a materially accurate representation of the outcome of the 2016 stress test. Specifically, banks should be mindful of the following potential inaccuracies associated with such use of the FDSF template:

- For a particular risk factor, the shock specified in the 2016 stress scenario may be outside the range of pre-defined shocks included in the FDSF template and extrapolation from these pre-defined shock impacts may produce a materially inaccurate loss figure;
- Similarly, while the shock specified in the stress scenario may be within the range of pre-defined shocks included in the FDSF template, it may be far from any particular shock in the template and interpolation may produce a materially inaccurate loss figure;<sup>(2)</sup>
- Certain cross-risk-factor P&L impacts may not be well represented in the FDSF template.

Banks that choose to use data from the FDSF market risk template should be mindful of the above issues and present their loss results in the Market Risk template ('Market Risk Stressed P&L') inclusive of all necessary adjustments in respect of these issues. In the descriptive analysis of the results, the numbers should be decomposed into a 'FDSF-inferred' result constructed purely from FDSF shock data, together with the variation to this result due to addressing any of the issues above (or, indeed, in respect of any other issues).

Banks that elect not to use FDSF data will, however, be expected to maintain at least the standards embodied in the FDSF template as regards risk factor granularity and P&L calculation.

(1) To be clear, it is expected that the FDSF template numbers would be relevant to the Liquids stress-test component; it is not expected that they would be relevant to the Structural Liquids and Illiquids stress-test components.

(2) Both the extrapolation and interpolation problems will be magnified when risk factor exposures are non-linear, as would be the case for options portfolios.

## Annex C

### Specific guidance regarding the calculation of RWA projections in the baseline and stress scenarios

Risk type	Capital component	Expectations regarding RWA projections
Market risk	Structural FX	To the extent that the scenario includes sustained and significant changes in exchange rates that are relevant to material positions held by a bank (eg USD/GBP), the risk and capital measures are expected to be adjusted accordingly.
	Standardised approach	RWAs calculated under standard rules approaches are expected to increase in line with projected growth in business.
	Value at Risk (VaR) and Stressed VaR (SVaR)	Projected combined (VaR and SVaR) capital components should increase to reflect increases in scenario volatility. Where projected VaR calculations are not based on a recalculation under scenarios, the Bank's expectation is that combined VaR- plus SVaR-based capital requirements increase to at least twice current SVaR when the scenario is characterised by an increase in market volatility.
	Risk Not in VaR (RNIV)	Banks should produce RNIV measures consistent with the scenario. RNIVs calculated using a VaR-type methodology should be scaled in a comparable way to VaR under the scenario. Stress-test type RNIVs should be assessed for whether their calibration is consistent with the traded risk stress scenario and, if inconsistent, should be recalibrated appropriately.
	Incremental Risk Charge (IRC)	A bank should adjust its IRC capital measure to be consistent with the scenario and, at the very least, scale its IRC capital measure in a way that is consistent with the uplift in capital due to credit rating movements applied to comparable wholesale credit assets under the scenario.
	Comprehensive risk measure (CRM)	There is no expectation that modelled CRM-derived RWAs should increase as a result of the stress scenario if the standardised credit risk floor is binding.  If the scenario results in losses against CRM positions, CRM RWAs should be reduced to reflect the loss in value of the positions.
	Trading Book securitisations	RWAs related to securitisations held in the trading book are considered as part of the securitisation stress test, not the traded risk stress test. If the market risk RWA submission includes trading book securitisations, this should be made clear in order to avoid double counting.
CVA risk	Overall	In respect of defaulted counterparties, there should be no corresponding reduction in CVA RWAs, as it should be assumed that the defaulted positions are replaced on a like-for-like basis. However, in respect of a highly material counterparty default (for example, the assumed default of a large uncollateralised counterparty), the potential decrease in CVA that this would occasion should be noted as a memo item.
	Standardised method	Other relevant quantities that are used to calculate the CVA charge using the standardised method, for example exposures and projected credit rating downgrades under the scenario, should inform the projected capital component.  Increases in credit risk capital due to increases in risk weights arising from downward credit migration are expected to be reflected in the weights used to calculate CVA RWAs using the standardised method.
	Advanced method	Stressed measures of other relevant quantities, namely the stressed VaR and stressed exposure calculations, should inform the stressed CVA RWA.  It is expected that the VaR component of CVA approach is consistent with the market risk approach.  It is expected that firms maintain the consistency between projected exposures used for CVA RWAs and counterparty credit risk RWAs as specified in the CRR.  Where the scenario has an impact on credit spreads, this impact should be reflected in a change in the level of CVA RWAs.
Counterparty credit risk	Collateralised counterparties	For exposures calculated using the counterparty credit risk mark-to-market (MtM) method, there is no expectation that exposure will change since the add-ons used to calculate exposure do not change with the scenario and the MtM is offset by collateral for the purposes of RWA calculation. It is assumed that margin agreements with non-defaulting counterparties will perform and collateral is received accordingly.  Since the Internal Model Method (IMM) exposure is the maximum of current and stressed measures, exposures are expected to increase if sustained market volatilities in the scenario are larger than those used to calibrate the Effective Expected Positive Exposure (EEPE) component of exposure. For the purpose of RWA calculation, it is assumed that margin agreements with non-defaulting counterparties will perform and collateral is received accordingly. It is also assumed that extended margin period of risk criteria are not triggered.  Risk weights are expected to be adjusted in line with the credit risk RWA calculation for all scenarios.
	Uncollateralised counterparties	For exposures calculated using the counterparty credit risk MtM method, projected increases in position MtM should be incorporated into the exposure.  For exposures calculated using the IMM method, projected increases in position MtM should be incorporated into the exposure.  Since IMM exposure is the maximum of current and stressed measures, exposures are expected to increase if sustained market volatilities in the scenario are larger under the scenario than those used to calibrate the current and stressed EEPE component of exposure.  Risk weights are expected to be adjusted in line with the credit risk RWA calculation for all scenarios.
	Treatment of unilateral accounting CVA under CRR Article 273(6)	Projected accounting unilateral CVA (as defined in CRR Article 273 para 6) that is deducted from exposures, should be consistent with the projected accounting unilateral CVA losses as at the end-of-year reporting dates and correspond to accounting unilateral CVA utilised for exposure at default (EAD) offset.  The Bank permits banks that calculate counterparty level projected accounting unilateral CVAs to reduce EAD for the calculation of projected RWAs under the scenarios.  Increased projected CVAs can provide RWA relief, if the bank calculates projected accounting CVA on a counterparty-specific basis. Otherwise, for the purposes of the RWA projection, the RWA-mitigating impact of increased projected accounting CVA would not be expected to be reflected in the projected RWAs.

## Glossary

**AFS** – Available For Sale.  
**AVA** – Additional Valuation Adjustment.  
**CDS** – Credit Default Swap.  
**CRM** – Comprehensive Risk Measure.  
**CRR** – Capital Requirements Regulation.  
**CVA** – Credit Valuation Adjustment.  
**DVA** – Debit Valuation Adjustment.  
**EAD** – Exposure at Default.  
**EEPE** – Effective Expected Positive Exposure.  
**FDSF** – Firm Data Submission Framework.  
**FVO** – Fair Value Option.  
**FVTPL** – Fair Value Through P&L.  
**IMM** – Internal Model Method.  
**IRC** – Incremental Risk Charge.  
**LAB** – Liquid Asset Buffer.  
**LGD** – Loss Given Default.  
**MtM** – Mark-to-Market.  
**P&L** – Profit and Loss.  
**PD** – Probability of Default.  
**PVA** – Prudent Valuation Adjustment.  
**RNIV** – Risks Not in VaR.  
**RWA** – Risk-Weighted Assets.  
**SFT** – Securities Financing Transaction.  
**SME** – Small and Medium-sized Enterprise.  
**SVaR** – Stressed Value at Risk.  
**VaR** – Value at Risk.