Basel Committee on Banking Supervision

Instructions: Impact study on the proposed frameworks for market risk and CVA risk

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BANK FOR INTERNATIONAL SETTLEMENTS

This publication is available on the BIS website (www.bis.org).

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Instructions: Impact study on the proposed frameworks for market risk and CVA risk

1.   Introduction

1.1   General

The workbook available for download on the Basel Committee's website is for information purposes only. While the structure of the workbooks used for the exercise is the same in all participating countries, **it is important that banks only use the workbook obtained from their respective national supervisory agency to submit their returns.** Only these workbooks are adjusted to reflect the particularities of the regulatory frameworks in participating countries. National supervisory agencies may also provide additional instructions, if deemed necessary.

1.1.2   Filling in the Data

Data should only be entered in the yellow shaded cells. There are also some pink cells which will be completed by the relevant national supervisory agency. **It is important to note that any modification to the worksheets might render the workbook unusable both for the validation of the final results and the subsequent aggregation process.**

Cell colours used in the Basel III monitoring reporting template

Colour	Content
Yellow	Input cell.
Pink	To be completed by the supervisor.
White, orange	Calculation result. Must not be changed.

Where information is not available, the corresponding cell should be left empty. No text such as "na" or zeroes should be entered in these cells. However, leaving a cell empty could trigger exclusion from some or all of the analyses if the respective item is required, i.e. participating institutions should aim to provide data for all **yellow** cells. The automated calculations in the workbook indicate whether or not a certain item can be calculated using the data provided.

Data can be reported in the most convenient currency. The currency which has been used should be recorded in the "General Info" worksheet. Supervisors will provide the relevant exchange rate for converting the reporting currency to euros. The **units** must be reported in **thousands** to avoid inconsistencies within submissions. The same currency and unit should be used for all amounts throughout the workbook, irrespective of the currency of the underlying exposures.

Percentages should be reported as **decimals** and will be converted to percentages automatically. For example, 1% should be entered as 0.01.

1.1.3 Scope of exercise

Participation in this Quantitative Impact Study (QIS) on the *Fundamental review of the trading book* (FRTB) and the *Review of the Credit Valuation Adjustment risk framework* (CVA)[1] will be carried out on a voluntary basis. However, participation is expected in particular from large internationally active banks. Participation of small and medium-sized banking institutions is also encouraged, as all of the banking institutions will likely be affected by some or all of the revisions to the reform being considered.

1.1.4 Reporting date

All data should be reported as of **30 June 2015**, unless the national supervisor provides alternative guidance.

1.1.5 Process

The Basel Committee or its Secretariat will not collect any data directly from participating institutions. Therefore, participating institutions in participating countries should contact their supervisory agency to discuss how the completed workbooks should be submitted. National supervisors will forward the relevant data to the Secretariat of the Basel Committee where individual institution data will be treated strictly confidential and will not be attributed to individual institutions.

Similarly, participating institutions should direct all questions related to this study, the related rules, standards and consultative documents to their national supervisory agencies. Where necessary, the supervisory agencies will coordinate their responses through the Secretariat of the Basel Committee to provide responses that are consistent across countries. A document with responses to frequently asked questions will be maintained on the Basel Committee's website.

Participating institutions should specify any instance where they had to deviate from the instructions provided in an additional document.

1.1.6 Timeline

Banks will have until **14 September 2015** to fill in the requested templates and submit them to their national supervisory agency. In case of data quality issues, some questions/requests for clarification will be sent to those banks concerned. These banks will be asked to resubmit data to their National Supervisory Authority by **7 October 2015**.

1.2 Fundamental Review of the Trading Book (FRTB)

This exercise separately focuses on **the entire trading book.** Further explanations on the shares of the portfolio to which each computation should be run are provided in the next section.

All the computations related to the FRTB worksheets should be completed based on the revised boundary, as outlined in Annex 1, on a best-efforts basis. If applying the revised boundary is deemed not to be feasible within the timeframe envisaged for this exercise, the current boundary can be used as a proxy. **Only one boundary definition should be used across all panels** (ie either the revised *or* the current boundary definition should be used).

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[1] Basel Committee on Banking Supervision, *Review of the Credit Valuation Adjustment Risk Framework*, July 2015, www.bis.org/bcbs/publ/d325.htm

The "FRTB-Global impacts" worksheet gathers data on the global impacts of the FRTB, except for the boundary impact. Indeed, all the computations have to be done on the same global trading book (ideally the trading book as defined by the revised boundary, or the trading book as defined by the current boundary as a proxy). The global trading book must be split in three: "non-securitisations", "securitisations (non CTP)", and "correlation trading portfolios". This is to analyse the clean impact on each of those books. It is acknowledged that both the current and revised approaches may account for some diversification or hedging benefits across those books for some risk measures; yet, precisely in order to get a clean impact, those diversification or hedging effects shall not be accounted for in this worksheet. In addition, the last panel of this worksheet gathers data at trading desks level.

The "FRTB-Revised SA" worksheet gathers data on the standardised approach for the global trading book. All its components are covered by this worksheet. The capital charge in the summary table would be the market risks capital charge if the bank was using only the standardised approach.

The "FRTB-Revised IMA" worksheet gathers additional desk-level and firm-wide level data (risk measures and backtesting) on the internal models approach.

1.2.1   Sub-trading books

The sub-portfolios at which the new risk measures apply may differ from the current sub-portfolios. An example is the scope internal models permission (which becomes trading desks-based). Another example is the securitisations trading books (non-correlation trading portfolio and correlation trading portfolio) which fall in the Standardised Approach while the current approach allow, for those portfolios, the use of the Internal Models Approach.

As a consequence, assessing the impact of the FRTB makes it necessary to gather risk measure computations at various portfolio levels.

For the purpose of this exercise, the following six portfolios are defined:
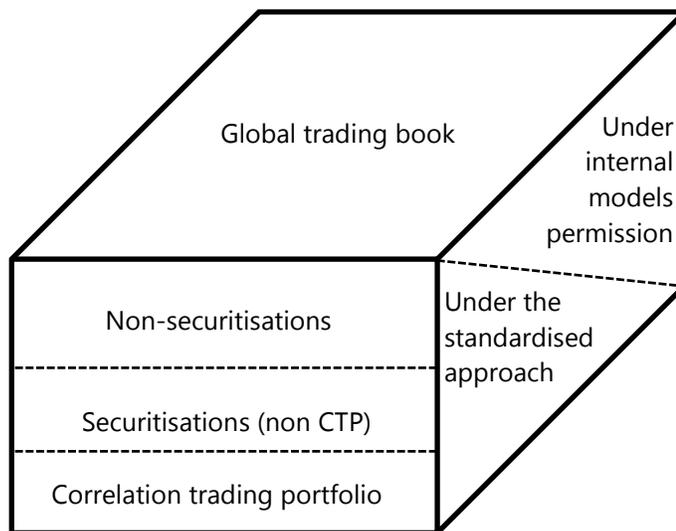
Global trading book: it includes all the instruments which are held in the trading book and subject to the current Basel Market Risk Framework. For FX and Commodity risk, instruments within scope are those in both the trading book and banking book.

The global trading book can be divided in three depending on the type of activities:

(i)   *Non-securitisations:* for the non-securitisation portion of this QIS, please exclude all securitisation desks, including securitisation positions and their hedges, as well as the entire correlation trading portfolio and its hedges**.**

(ii)   *Securitisations (non CTP):* all securitisation desks, including securitisation positions and their hedges, but excluding the correlation trading portfolio and its hedges.

(iii)   *Correlation trading portfolio:* the entire correlation trading portfolio and its hedges.

The global trading book can otherwise be divided in two depending on the type of approach used to compute the market risks:

(i)   *Under internal models permission:* the share of the global trading book that currently has internal models permission. Currently, internal models permission can be granted for specific risk factor categories while under the FRTB it is granted at trading desk level: if a given trading desk currently has internal models permission only for some risk factors but not others (eg it has permission to use the IMA for FX but not for specific interest rate risk), this trading desk should be considered under internal models permission for the purpose of this QIS, and internal VaR or ES measures may be used instead of regulatory risk measures.

(ii)   *Under the standardised approach:* the share of the global trading book which is not under internal models permission.

In the template, for each panel, the "Portfolio" at which the computations must be run is explicitly specified (see for instance worksheet 'FRTB-Global impacts' cell 'C16').

1.3   Credit Valuation Adjustment (CVA)

The Basel Committee on Banking Supervision is using this exercise to analyse the potential impact of its proposed revised CVA capital framework. The objectives are:

- to assess the capital impact of the proposed revised framework compared to the current CVA framework;

- to provide data to support the calibration of the revised framework and assess options related to liquidity horizons and exposure models; and

- to assess the potential implementation issues of the framework by testing large, real life portfolios.

All reporting banks are asked to complete the worksheets "General Info" and "CVA-Top 50". In the worksheet "CVA-Top 50", all reporting banks are asked to complete sections relating to the Basic Approach, even those banks that also complete sections relating to the FRTB-CVA framework.

Only banks that can implement the FRTB-CVA framework should complete the other worksheets ('CVA-Bank', 'CVA-Sovereign, Liquid', etc). For those worksheets, banks are encouraged to implement as many of the FRTB-CVA framework approaches as possible (e.g. SA-CVA and IMA-CVA under Option A or Option B) and should at least implement one of those approaches. For those worksheets, banks should also complete the sections related to the Basic Approach.

1.3.1 General assumptions for the data collection

Throughout this exercise, the term "CVA" unless otherwise qualified, is intended to refer to "unilateral CVA". Where CVA might be considered as including a "debit value adjustment" (or "DVA"), it will be referred to explicitly as "bilateral CVA".

For the purposes of this QIS exercise, banks should exclude CVA calculations for derivatives cleared through a qualifying central counterparty.

1.3.2 Identification of reported counterparties

This CVA QIS exercise asks reporting banks to identify their largest counterparties.

For the 'CVA-Top 50' worksheet, the largest counterparties should be determined by the magnitude of the absolute amount of accounting unilateral CVA that firms recognise against that counterparty. Therefore, only counterparties for which firms compute an accounting CVA (unilateral or bilateral) can be selected. CVA hedges should be excluded from this calculation. For this worksheet, firms should select 50 individual counterparties or as many as they can if they have less than 50 counterparties. Where banks believe that their largest 50 counterparties identified using accounting CVA will not be representative of the 50 counterparties with the largest CVA risk under the proposed (future) regulatory CVA framework, for example where their national accounting standards exempt them from calculating CVA, they may instead opt to identify their largest 50 counterparties based on the following criteria:

- banks that are currently under the advanced CVA risk capital charge may use the magnitude of the absolute amount of regulatory CVA, calculated at a counterparty level as specified in paragraph 99 Annex 4 of the Basel III framework;

- banks that are currently under the standardised CVA risk capital charge may use $M_i \cdot EAD_i$ as specified in paragraph 104 Annex 4 of the Basel III framework (i.e. the effective maturity times the exposure at default).

For the other worksheets ('CVA-Bank', 'CVA-Sovereign, Liquid', etc), the largest counterparties should be determined by the magnitude of the absolute amount of regulatory CVA, calculated at a counterparty level as specified under the advanced approach of the current CVA framework (see paragraph 98 of the revised Annex 4). Therefore, only counterparties for which firms compute a regulatory CVA under the advanced approach can be selected. If a firm does not currently compute regulatory CVA since it does not apply the advanced approach of the current CVA framework, but still intends to implement any of the approaches set out under the FRTB-CVA framework, it should select the largest counterparties according to the magnitude of the absolute amount of accounting unilateral CVA instead of using regulatory CVA. CVA hedges should be excluded from this calculation. For these worksheets, firms should select the number of individual counterparties as indicated in each worksheet or as many as they can if they have less than the required number of counterparties.

For the purposes of this identification exercise, banks should understand a counterparty to mean the individual legal entity, rather than globally consolidated groups of individual legal entities.

2. General Info

There are five panels within the "General Info" worksheet. Panel A gathers general bank reporting data, and Panels B-E gather basic information that is needed to process and interpret the survey results, and

should be completed by all participating institutions. It is worth noting that Panels B-D pertain solely to the CVA portion of this exercise.

2.1   Panel A: General bank data

Panel A of the "General Info" worksheet deals with bank and reporting data conventions.

Row	Column	Heading	Description
6	C	Country code	Leave Blank.
7	C	Region code	Leave Blank.
8	C	Bank number	Leave Blank.
9	C	Bank group	Leave Blank.
10	C	Conversion rate (in euros/reporting currency)	Leave Blank.
11	C	Units	Do not change. Units in which results are reported. Set in thousands to avoid inconsistencies within submissions.
12	C	Submission date (yyyy-mm-dd)	Leave Blank.
13	C	Reporting date (yyyy-mm-dd)	Date as of which all data are reported in worksheets.
14	C	Reporting currency (ISO code)	Three-character ISO code of the currency in which all data are reported (e.g. USD, EUR).
15	C	Accounting standard	Indicate the accounting standard used.

2.2   Panel B: Breakdown of total accounting CVA and DVA

This panel asks for an overview of the total CVA that banks recognise for their global group for accounting purposes.

Row	Column	Heading	Description
19	C	Accounting CVA	The unilateral CVA based on internal calculations that would be recognised for accounting purposes
20	C	Accounting DVA	The DVA (debit valuation adjustment) based on internal calculations that would be recognised for accounting purposes. This DVA amount should not include any funding valuation adjustment (FVA) that banks recognise for accounting purposes.

2.3   Panel C: Breakdown of total Basel III CVA risk capital charges

This panel asks for an overview of the total Basel III CVA risk capital charges that banks must hold capital against, for their global group for regulatory purposes.

Row	Column	Heading	Description
27-29	C	Including the effects of all recognised eligible hedges	CVA capital charge amounts including the effects of all recognised eligible hedges
27-29	D	Excluding the effects of all recognised eligible hedges	CVA capital charge amounts excluding the effects of all recognised eligible hedges
27	C-D	Capital charges under the advanced approach	The capital charges using the current Basel III advanced approach, for those portfolios that are presently calculated under the advanced approach.
28	C-D	Capital charges under the standardised approach	The capital charges using the current Basel III standardised approach, for those portfolios that are presently calculated under the standardised approach.
29	C-D	Total capital charges	Sum of rows 27 and 28

2.4   Panel D: Breakdown of accounting CVA and total Basel III CVA risk charge per counterparty type

This panel provides a breakdown of the data reported in panels B and C on accounting CVA and total Basel III CVA risk capital charges. Reporting banks should categorise counterparties based on the main line of activity of that counterparty.

Row	Column	Heading	Description
35-44	D	Number of counterparties	The total number of counterparties using the definition set out in 1.3.2.
35-44	E	Accounting CVA	The unilateral CVA based on internal calculations that would be recognised for accounting purposes
35-44	F	Total capital charge with hedges	The hypothetical regulatory CVA risk capital charge that would be calculated if the counterparties in the row were the only exposures of the bank. The risk charge should be calculated using the same approach as prescribed in panel B (i.e. using the standardised approach for portfolios that are presently not permitted to be calculated under the advanced approach, and the advanced approach otherwise). This calculation should include the effects of single-name hedges that may be recognised as eligible hedges against the relevant counterparties. All index hedges should be excluded from this calculation. Where possible, the regulatory CVA risk capital charge reported in this column should be calculated using the Revised version of the Basel III capital rules reflecting the CVA modification published 1 June 2011, as opposed to the version implemented by the reporting bank's national supervisory agency.
35-44	G	Total capital charge without hedges	The hypothetical regulatory CVA risk capital charge that would be calculated if the counterparties in the row were the only exposures of the bank. The risk charge should be calculated using the same approach as prescribed in panel B (i.e. using the standardised approach for portfolios that are presently not permitted to be calculated under the advanced approach, and the advanced approach otherwise). This calculation should exclude the effects of all eligible hedges against the relevant counterparties. Where possible, the regulatory CVA risk capital charge reported in this column should be calculated using the Revised version of the Basel III capital rules reflecting the CVA modification published 1 June 2011, as opposed to the version implemented by the reporting bank's national supervisory agency.
35-44	D-G	Margined / Unmargined	A margined netting set is a netting set for which there is a periodic exchange of collateral connected to the mark-to-market movements of the transactions with the counterparty. An unmargined netting set is a netting set for which there is no exchange of collateral connected to either the mark-to-market movements or the potential future exposure of the trades. Where reporting banks have both margined and unmargined netting set with the same counterparty, the associated CVA and capital charge amounts should be correspondingly split between margined and unmargined categories, and this counterparty should be recorded as 0.5 in both the margined and unmargined rows for the column "Number of counterparties".

Row	Column	Heading	Description
35-36	D-G	Banks	All credit institutions, such as banks, multilateral banks, credit unions, and other forms of prudentially regulated credit institutions.
37-38	D-G	Other financials	All financial corporations and quasi-corporations other than credit institutions, such as: investment firms, investment funds, insurance companies, pension funds, collective investment undertakings, and clearing houses as well as remaining financial intermediaries and financial auxiliaries.
39-40	D-G	Non-financials	Corporations and quasi-corporations not engaged in financial intermediation not falling into the categories in rows 35-38.
41-42	D-G	Sovereigns	Both i) central banks; and ii) general governments: central governments, state or regional governments, and local governments, including administrative bodies and non-commercial undertakings, but excluding public companies and private companies held by these administrations that have a commercial activity (which shall be reported under "non-financial corporations", "banks" or "other financials"); social security funds; and international organisations, such as the European Community, the International Monetary Fund and the Bank for International Settlements.
43-44	D-G	Others	All other exposures, including households: individuals or groups of individuals as consumers, and producers of goods and non-financial services exclusively for their own final consumption, and as producers of market goods and non-financial and financial services provided that their activities are not those of quasi-corporations. Non-profit institutions which serve households and which are principally engaged in the production of non-market goods and services intended for particular groups of households are included.

2.5   Panel E: Additional information – closed form questions

2.5.1   Panel E).1: CVA Questions

This panel collects additional qualitative information on accounting and regulatory CVA via closed-form questions. A number of initial questions are defined in the template. The Committee may circulate additional closed-form questions in due course. For the additional questions, a set of up to 100 answers will be provided. Banks will have to pick from the list in the "Answer" column the answer relevant to them.

Row	Column	Heading	Description
49-88	C	Answer	Banks should pick from the list the answer relevant to them when any additional closed-form questions are circulated.
49-88	D	Remarks	Include any comments related to additional closed-form questions.

2.5.2   Panel E).2: FRTB Questions

This panel collects additional qualitative information for the FRTB via closed-form questions. The Committee may circulate closed-form questions in due course for this panel. A set of up to 100 answers will be provided. Banks will have to pick from the list in the "Answer" column the answer relevant to them.

Row	Column	Heading	Description
49-88	G	Answer	Banks should pick from the list the answer relevant to them when any closed-form questions are potentially circulated.
49-88	H	Remarks	Include any comments related to additional closed-form questions.

3.   FRTB- Global Impacts

The "TB general" worksheet, made of three panels, with two sub-sections each. For panel A, sections 1 and 2:

(i)   The computations on the internal models approach (current and proposed capital charge) are to be performed **only on the share of a participating bank's trading book that has received IMA approval**.

(ii)   Computations on the standardised measurement method (current capital charges) are to be performed **only on the share of a participating bank's trading book that does not currently have IMA approval**.

(iii)   Computations on the standardised approach: SA (proposed capital charges) are to be performed **only on the share of a participating bank's trading book that does not currently have IMA approval**. Specifically:

•   Banks that have no share of their non-securitisation trading book currently on the standardised measurement method should report "0" in the relevant cells.

•   Banks that have no share of their non-securitisation trading book with IMA approval should report figures in these cells that are consistent with the "FRTB-Revised SA" worksheet.

3.1   Panel A).1: Current market risk capital charge under the revised boundary for the non-securitisations portfolio

Panel A).1 gathers information on the current market capital risk charge. Computations are to be based on the revised boundary, as outlined in Annex 1.

Row	Column	Heading	Description
A)1. Current market risk capital charge under the revised boundary for the non-securitisations portfolio			
As mentioned in Section 1.1, computations for this panel should **exclude** all securitisation desks. This means all securitisation positions and their hedges, as well as the entire correlation trading portfolio and its hedges should be excluded.			
24	C	Standardised measurement method, general interest rate risk	Capital charge for **general** interest rate risk based on the standardised measurement method as applicable at the reporting date. The capital charge should be inclusive of all risks that enter the standardised general interest rate risk capital charge.
25	C	Standardised measurement method, general equity position risk	Capital charge for **general** equity position risk based on the standardised measurement method as applicable at the reporting date. The capital charge should be inclusive of all risks that enter the standardised general equity position risk capital charge.

Row	Column	Heading	Description
27	C	Standardised measurement method, specific interest rate risk	Capital charge for **specific** interest rate risk based on the standardised measurement method as applicable at the reporting date. The capital charge should be inclusive of all risks that enter the standardised specific interest rate risk capital charge.
28	C	Standardised measurement method, specific equity position risk	Capital charge for **specific** equity position risk based on the standardised measurement method as applicable at the reporting date. The capital charge should be inclusive of all risks that enter the standardised specific equity position risk capital charge.
29	C	Standardised measurement method, foreign exchange risk	Capital charge for foreign exchange position risk based on the standardised measurement method as applicable at the reporting date. The capital charge should be inclusive of all risks that enter the foreign exchange risk capital charge.
30	C	Standardised measurement method, commodities risk	Capital charge for commodities position risk based on the standardised measurement method as applicable at the reporting date. The capital charge should be inclusive of all risks that enter the commodities risk capital charge.
32–37	C	Standardised measurement method, options risks (by methodologies)	Capital charge for options risk, depending on which approach is used (among the simplified approach, the delta-plus approach, and the scenario approach). Computations should be done only once (ie banks are not supposed to compute three times their capital charge, based on each of the methods: instead, the total capital on options risk is to be the sum of the capital computed for all methods). If banks are not using an approach, they should enter 0 in the related cells.
38	C	Internal models approach **without** the specific risk surcharge, **actual capital charge**	Capital charge for general and specific risk based on internal models. The capital charge should be inclusive of all positions that receive internal model treatment. This should only include the value-at-risk and, when applicable, the stressed value-at-risk capital requirement, and **reflect the actual multipliers**.
39	C	Current 10-day 99% value-at-risk (**withou**t **applying the multiplier**)	Bank-wide 10-day value-at-risk inclusive of all sources of risk that are included in the value-at-risk calculation. The reported value-at-risk should not reflect any multiplier, rather the number entered in this cell should simply be the bank's estimate of the 10-day, 99% value-at-risk of the bank's trading book portfolio as of the reporting date.
41	C	10-day 99% stressed value-at-risk (**without** applying the multiplier)	Bank-wide 10-day **stressed** value-at-risk inclusive of all sources of risk that are included in the stressed value-at-risk calculation. The reported stressed value-at-risk should not reflect any multiplier, rather the number entered in this cell should simply be the bank's estimate of the 10-day, 99% stressed value-at-risk of the bank's trading book portfolio as of the reporting date.
43	C	Internal models approach, specific risk surcharge (2011 only)	Surcharge for specific risk based on a multiplier of 4.0. Accordingly, the surcharge is equivalent to one times the internally modelled specific risk capital charge. Once the Revisions are in force, banks should enter 0 in this cell.
44	C	Incremental risk capital charge	Capital charge for incremental risk in the trading book.

Row	Column	Heading	Description
2)		**Other Pillar 1 capital requirements**	
As mentioned in Section 1.1, computations for this panel should exclude all securitisation positions and their hedges, as well as the entire correlation trading portfolio and its hedges.			
46	C	Risks not in VaR	Risks not in VaR
47	C	Other Pillar 1 requirements for market risk	Other Pillar 1 capital charges for market risk imposed by the national regulator. If no such requirements exist, 0 should be entered.
48	C	Market risk capital charge which the bank is unable to assign to one of the above categories	If a bank is unable to assign a portion of their market risk capital charge to one of the above categories in this panel, this portion should be reported in this row.

3.2 Panel A)2: Proposed market risk capital charge under the revised boundary

Panel A)2 gathers information on the revised market risk capital charge. Computations are to be based on the revised boundary, as outlined in Annex 1.

Row	Column	Heading	Description
61,67,73	C	General interest rate risk (delta, vega, and curvature risks, respectively)	Capital requirements as defined in Annex 1.
62,68,74	C	Credit spread risk: non-securitisations (delta, vega, and curvature risks, respectively)	Capital requirements as defined in Annex 1.
63,69,75	C	Equity risk (delta, vega, and curvature risks, respectively)	Capital requirements as defined in Annex 1.
64,70,76	C	Commodity risk (delta, vega, and curvature risks, respectively)	Capital requirements as defined in Annex1.
65,71,77	C	Foreign exchange risk (delta, vega, and curvature risks, respectively)	Capital requirements as defined in 1.
78	C	Default risk: non-securitisations	Capital requirements as defined in Annex 1.
79	C	Residual risk for prepayment	Capital requirements as defined in Annex 1.
80	C	Residual risks add-on	Capital requirements as defined in Annex 1.
84-100	C	Expected Shortfall at the trading book level (**without** applying any multiplier) (broken down into various liquidity horizons)	Capital requirements as defined in Annex 1.
103-119	C	At the risk factor class level: interest rate risk (broken down into various liquidity horizons)	Capital requirements as defined in Annex 1.
122-138	C	At the risk factor class level: credit spread risk (broken down into various liquidity horizons)	Capital requirements as defined in Annex 1.

Row	Column	Heading	Description
141-157	C	At the risk factor class level: equity risk (broken down into various liquidity horizons)	Capital requirements as defined in Annex 1.
160-176	C	At the risk factor class level: commodity risk (broken down into various liquidity horizons)	Capital requirements as defined in Annex 1.
179-195	C	At the risk factor class level: foreign exchange risk (broken down into various liquidity horizons)	Capital requirements as defined in Annex 1.
198	C	SES, of which: Interest rate non-modellable risk factors	Capital requirements as defined in Annex 1.
199	C	SES, of which: Credit spread non-modellable risk factors	Capital requirements as defined in Annex 1.
200	C	SES, of which: Equity non-modellable risk factors	Capital requirements as defined in Annex 1.
201	C	SES, of which: Commodity non-modellable risk factors	Capital requirements as defined in Annex 1.
202	C	SES, of which: Foreign-exchange non-modellable risk factors	Capital requirements as defined in Annex 1.
196	C	Assumed rho parameter	Set at 0.5 for the purpose of this QIS.
203	C	Internal models approach, default charge	Capital requirements as defined in Annex 1.

3.3 Panel B)1: Current market risk capital charge under the revised boundary for the securitisations (non-CTP) portfolio

Panel B)1 gathers information on the current market capital risk charge. Computations are to be based on the revised boundary, as outlined in Annex 1.

Row	Column	Heading	Description
B)1 Current market risk capital charge under the revised boundary for the securitisations (non-CTP) portfolio			
As mentioned in Section 1.1, computations for this panel should **exclude** all non-securitisation exposures, with the exception of hedges.			
215	C	Standardised measurement method, general interest rate risk	Capital charge for **general** interest rate risk based on the standardised measurement method as applicable at the reporting date. The capital charge should be inclusive of all risks that enter the standardised general interest rate risk capital charge.
216	C	Standardised measurement method, specific interest rate risk	Capital charge for **specific** interest rate risk based on the standardised measurement method as applicable at the reporting date. The capital charge should be inclusive of all risks that enter the standardised specific interest rate risk capital charge.

Row	Column	Heading	Description
217	C	Standardised measurement method, foreign exchange risk	Capital charge for foreign exchange position risk based on the standardised measurement method as applicable at the reporting date. The capital charge should be inclusive of all risks that enter the foreign exchange risk capital charge.
219-223	C	Standardised measurement method, options risks (by methodologies)	Capital charge for options risk, depending on which approach is used (among the simplified approach, the delta-plus approach, and the scenario approach). Computations should be done only once (i.e. banks are not supposed to compute three times their capital charge, based on each of the methods: instead, the total capital on options risk is to be the sum of the capital computed for all methods). If banks are not using an approach, they should enter 0 in the related cells.
224	C	Internal models approach **without** the specific risk surcharge, **actual capital charge**	Capital charge for general and specific risk based on internal models. The capital charge should be inclusive of all positions that receive internal model treatment. This should only include the value-at-risk and, when applicable, the stressed value-at-risk capital requirement, and **reflect the actual multipliers**.
225	C	Current 10-day 99% value-at-risk (**without** applying the multiplier)	Bank-wide 10-day value-at-risk inclusive of all sources of risk that are included in the value-at-risk calculation. The reported value-at-risk should not reflect any multiplier, rather the number entered in this cell should simply be the bank's estimate of the 10-day, 99% value-at-risk of the bank's trading book portfolio as of the reporting date.
227	C	10-day 99% stressed value-at-risk (**without** applying the multiplier)	Bank-wide 10-day **stressed** value-at-risk inclusive of all sources of risk that are included in the stressed value-at-risk calculation. The reported stressed value-at-risk should not reflect any multiplier, rather the number entered in this cell should simply be the bank's estimate of the 10-day, 99% stressed value-at-risk of the bank's trading book portfolio as of the reporting date.
Other Pillar 1 capital requirements As mentioned in Section 1.1, computations for this panel should exclude all non-securitisation positions, with the exception of hedges			
229	C	Other Pillar 1 requirements for market risk	Other Pillar 1 capital charges for market risk imposed by the national regulator. If no such requirements exist, 0 should be entered.
230	C	Market risk capital charge which the bank is unable to assign to one of the above categories	If a bank is unable to assign a portion of their market risk capital charge to one of the above categories in this panel, this portion should be reported in this row.

3.4 Panel B)2: Proposed market risk capital charge under the revised boundary for the securitisations (non-CTP) portfolio

Panel B)2 gathers information on the revised market risk capital charge. Computations are to be based on the revised boundary, as outlined in Annex 1.

Row	Column	Heading	Description
242,246, 250	C	General interest rate risk (delta, vega, and curvature risks, respectively)	Capital requirements as defined in Annex 1.
243,247, 251	C	Credit spread risk: securitisations (delta, vega, and curvature risks, respectively)	Capital requirements as defined in Annex 1.
244,248, ,252	C	Foreign exchange risk (delta, vega, and curvature risks, respectively)	Capital requirements as defined in Annex 1.
253	C	Default risk: securitisations	Capital requirements as defined in Annex 1.
295	C	Residual risk for prepayment related to mortgages	Capital requirements as defined in Annex 1.
296	C	Residual risk for prepayment related to non-mortgages	Capital requirements as defined in Annex 1.
257	C	Residual risk	Capital requirements as defined in Annex 1.

3.5 Panel C)1: Proposed market risk capital charge under the revised boundary for the correlation trading portfolio

Row	Column	Heading	Description
C)1. Current market risk capital charge under the revised boundary for the non-securitisations portfolio			
As mentioned in Section 1.1, computations for this panel should exclude all securitisation positions and their hedges, as well as non-securitisation positions and their hedges.			
269	C	Standardised measurement method, general interest rate risk	Capital charge for **general** interest rate risk based on the standardised measurement method as applicable at the reporting date. The capital charge should be inclusive of all risks that enter the standardised general interest rate risk capital charge.
270	C	Standardised measurement method, specific interest rate risk	Capital charge for **specific** interest rate risk based on the standardised measurement method as applicable at the reporting date. The capital charge should be inclusive of all risks that enter the standardised specific interest rate risk capital charge.
271	C	Standardised measurement method, foreign exchange risk	Capital charge for foreign exchange position risk based on the standardised measurement method as applicable at the reporting date. The capital charge should be inclusive of all risks that enter the foreign exchange risk capital charge.
273-277	C	Standardised measurement method, options risks (by methodologies)	Capital charge for options risk, depending on which approach is used (among the simplified approach, the delta-plus approach, and the scenario approach). Computations should be done only once (ie banks are not supposed to compute three times their capital charge, based on each of the methods: instead, the total capital on options risk is to be the sum of the capital computed for all methods). If banks are not using an approach, they should enter 0 in the related cells.

Row	Column	Heading	Description
278	C	Internal models approach **without** the specific risk surcharge, **actual capital charge**	Capital charge for general and specific risk based on internal models. The capital charge should be inclusive of all positions that receive internal model treatment. This should only include the value-at-risk and, when applicable, the stressed value-at-risk capital requirement, and **reflect the actual multipliers**.
279	C	Current 10-day 99% value-at-risk (**without** applying the multiplier)	Bank-wide 10-day value-at-risk inclusive of all sources of risk that are included in the value-at-risk calculation. The reported value-at-risk should not reflect any multiplier, rather the number entered in this cell should simply be the bank's estimate of the 10-day, 99% value-at-risk of the bank's trading book portfolio as of the reporting date.
281	C	10-day 99% stressed value-at-risk (**without** applying the multiplier)	Bank-wide 10-day **stressed** value-at-risk inclusive of all sources of risk that are included in the stressed value-at-risk calculation. The reported stressed value-at-risk should not reflect any multiplier, rather the number entered in this cell should simply be the bank's estimate of the 10-day, 99% stressed value-at-risk of the bank's trading book portfolio as of the reporting date.
284	C	Comprehensive risk model, before application of the floor	Capital requirements as defined in Annex 1.
285	C	Standardised measurement method (100%) for exposures **subject to** the CRM	Capital requirements as defined in Annex 1.
286	C	Standardised measurement method for exposures **not** subject to the CRM	Capital requirements as defined in Annex 1.
2)	**Other Pillar 1 capital requirements**		
As mentioned in Section 1.1, computations for this panel should exclude all securitisation positions and their hedges, as well as non-securitisation positions and their hedges.			
287	C	Other Pillar 1 requirements for market risk	Other Pillar 1 capital charges for market risk imposed by the national regulator. If no such requirements exist, 0 should be entered.
288	C	Market risk capital charge which the bank is unable to assign to one of the above categories	If a bank is unable to assign a portion of their market risk capital charge to one of the above categories in this panel, this portion should be reported in this row.

3.6 Panel C)2: Proposed market risk capital charge under the revised boundary for the correlation trading portfolio

Panel C)2 gathers information on the revised market risk capital charge. Computations are to be based on the revised boundary, as outlined in Annex 1.

Row	Column	Heading	Description
300,304, 308	C	General interest rate risk (delta, vega, and curvature risks, respectively)	Capital requirements as defined in Annex 1.
301,305, 309	C	Credit spread risk: correlation trading portfolio (delta, vega, and curvature risks, respectively)	Capital requirements as defined in Annex 1.
302,306, 400	C	Foreign exchange risk (delta, vega, and curvature risks, respectively)	Capital requirements as defined in Annex 1.
311	C	Default risk: correlation trading portfolio	Capital requirements as defined in Annex 1.
308	C	Residual risk	Capital requirements as defined in Annex 1.

3.7   Panel D: Risk Metrics at Desk Level

Data being collected at the desk level will serve to assess the impact of FRTB rules on different markets. This is in line with FRTB requirements for regulatory disclosure. Firms are encouraged to provide information for the top 100 desks ranked by current market risk requirements.

Row	Column	Heading	Description
324-423	C	Desk name	Name of the desk or desk identifier
324-423	D	Regulatory Desks	Select from drop down menu one of the regulatory desk types that matches closest the activity of the desk
324-423	E	10 day VaR	Desk level 10 day 99% Value at Risk
324-423	F	10 day sVaR	Desk level 10 day 99% Stressed Value at Risk
324-423	G	Default Charge	Desk level Incremental Risk Charge or Comprehensive Risk Measure
324-423	H	SMM Charges	Desk level SMM charges
324-423	I	Other Current Charges	Desk level other charges including standardised charges
324-423	J	ES	Desk level FRTB IMA (Internal Models Approach) stressed ES 97.5% with varying liquidity horizons
324-423	K	IMA Default	Desk level FRTB IMA default charge
324-423	L	NMRF	Desk level FRTB IMA Non Modellable Risk Factors
324-423	M	SA No default	Desk level FRTB Standardised Approach capital charge, including GIRR, CSR, FX,, EQ, Commodity, excluding default component,
324-423	N	SA Default Only	Desk level FRTB Standardised Approach default capital charge, including GIRR, CSR, FX, EQ, Commodity
324-423	O	Notional Residual Add on	Notional of position in scope for a residual add on charge under the FRTB standardised approach

4. FRTB-Revised SA

The instructions below relate to the "FRTB-Revised SA" worksheet, which pertains to the proposed standardised approach: "sensitivities-based approach."

This worksheet **should be filled in by all banks participating in the trading book exercise.** Specifically, the "FRTB-Revised SA" worksheet gathers data **at the bank-wide portfolio (ie top-of-the-house) level,** *including the share of the portfolio having received internal models approval.*

For FX and Commodity risk, instruments within scope are those in both the trading book and banking book.

4.1 Panels A to G: Notations for delta risk, vega risk and curvature risk

The descriptions in the table below largely reflect identical notations used in the draft standards in Annex 1.

Row	Column	Heading	Description	
			Detailed notation	Remarks
Delta risk				
	Panels A,B,C,E,F: Columns F,G,H. **Panel D:** Columns H,I,J	Kb (Medium, High, Low Correlations)	$\sqrt{\sum_k WS_k^2 + \sum_k \sum_{k \neq l} \rho_{kl} WS_k WS_l}$	Weighted sensitivities aggregated within each bucket, ie "bucket level capital". (See Annex 1). **The weighted sensitivities in this column must be multiplied by the applicable value(s) for ρ_{kl}, including any scaled values to capture basis risk** (see Annex 1).
	Panel D: Columns F and G	Market Value (Gross Positive and Negative)	V_i	• The market value of an instrument i as a function of the risk-free interest rate curve and credit spread curve
	Panel D: Column K	Sb	$S_b = \sum_k WS_K$	• The equation to the left holds for all risk factors in bucket b, provided that the resultant linear risk capital charge for the risk class is a positive number. • If the linear risk capital charge for the risk class is not a positive number, then $S_b = \max[\min(\sum_k WS_K, K_b), -K_b]$ • Please see Annex 1 for details.
	Panels A,B,C,E,F: Column I **Panel G:** Column F	$\sum WS$	$\sum_k WS_k$	• Derive the risk weighted net sensitivity to each risk factor k (WS_k), following the steps in Annex 1. • Sum the derived values for WS_k for **all** risk factors within a bucket.

Row	Column	Heading	Description	
			Detailed notation	Remarks
	Panels A,B,C,E,F: Column J **Panel D:** Column L	$\sum WS2$	$$\sum_k WS_k^2$$	• Square **each** of the derived values for WS_k, which were used for Column G. • Sum these (WS_k^2) values within a bucket.
	Panels A,B,C,E,F: Column K **Panel D:** Column M	$\Sigma\,(99.90)$	$$\sum_k \sum_{k \neq l} (1_{\rho kl\,=\,99.90\%})\,WS_k WS_l$$ With $1_{\rho_{kl}=z} = 1$ if $\rho_{kl} = z$ and 0 otherwise.	Calculate the cross sum of weighted sensitivities between different risk factors within each bucket for which ρ_{kl} = 99.90% (ie *equal* to 99.90%, not *multiplied* by 99.90% or 0.999. See Annex 1 for details). **Note that the cross sum of weighted sensitivities must be reported without multiplication by ρ_{kl}.**
	Panel A: Within columns L:EH **Panels B,C:** L,N **Panel D:** Column N,P **Panel E,F:** Column L	$\Sigma\,rho$	$$\sum_k \sum_{k \neq l} \left(1_{\rho_{kl}=\rho_{kl}^{(+)}}\right) WS_k WS_l$$ With $1_{\rho_{kl}=z} = 1$ if $\rho_{kl} = z$	Calculate the cross sum of weighted sensitivities between different risk factors within each bucket. Note that the cross sum of weighted sensitivities must be **reported without multiplication by ρ_{kl}**. These calculations should **ignore the specification** of sensitivity pairs subject to values for ρ_{kl} that would be scaled by a factor of 0.999 to capture basis risk. (specified in square brackets and italics in Annex 1.)
	Panel A: Within columns L:EH **Panels B,C:** M,O **Panel D:** Column O,Q **Panel E,F:** Column M	$\Sigma\,rho.(1\text{-}x)$	$$\sum_k \sum_{k \neq l} (1_{\rho kl\text{ and }\rho kl.(0.999)})\,WS_k WS_l$$	Calculate the cross sum of weighted sensitivities between different risk factors within each bucket, which **do not ignore the specification of sensitivity pairs subject to values for ρ_{kl} that would be scaled by a factor of 0.999 to capture basis risk**. (These are specified in square brackets and italics in Annex 1). Note that the cross sum of weighted sensitivities must be **reported without multiplication by ρ_{kl}**.
	Panel A: Within columns BR:EL	Curr/USD and Curr/EUR	Cross currency basis risk factors	Please refer to Annex 1 for details.

Row	Column	Heading	Description	
			Detailed notation	Remarks
Vega risk				
	Panel A: Columns R,S,T **Panels B,C:** Columns P,Q,R **Panel D:** Columns R,S,T **Panels E,F:** Columns N,O,P **Panel G:** Columns H,I,J	Kb (Medium, High, Low Correlations)	$$\sqrt{\sum_k WS_k^2 + \sum_k \sum_{k \neq l} \rho_{kl} WS_k WS_l}$$	Weighted sensitivities aggregated within each bucket, ie "bucket level capital". (See Annex 1). **The weighted sensitivities in this column must be multiplied by the applicable value(s) for ρ_{kl}.**
	Panel A: Column EP **Panels B,C:** Column S **Panel D:** Column U **Panels E,F:** Column Q **Panel G:** Column K	$\sum WS$	$$\sum_k WS_k$$	• Derive the risk weighted net sensitivity to each risk factor k (WS_k), following the steps in Annex 1. • Sum the derived values for WS_k for **all** risk factors within a bucket.
	Panel A: Column EQ **Panels B,C:** Column T **Panel D:** Column V **Panels E,F:** Column R **Panel G:** Column L	$\sum WS2$	$$\sum_k WS_k^2$$	• Square **each** of the derived values for WS_k. • Sum these (WS_k^2) values within a bucket.
Curvature risk				
	Panels B,C: Columns X,Y,Z **Panel D:** Columns Z, AA,AB **Panels E,F:** Columns V,W,X **Panel G:** Columns Q,R,S	Kb (Medium, High, Low Correlations)	$$\sqrt{\begin{array}{l} \max\left(0, \sum_k \max(CVR_k, 0)^2 \\ + \sum_k \sum_{k \neq l} \rho_{kl} CVR_k CVR_l \varphi\left(CVR_k, CVR_l\right)\right) \end{array}}$$	Weighted sensitivities aggregated within each bucket, ie "bucket level capital". (See Annex 1). **The weighted sensitivities in this column must be multiplied by the applicable value(s) for ρ_{kl} and φ.**

Row	Column	Heading	Description	
			Detailed notation	Remarks
	Panel A: Column EU **Panels B,C:** Column AA **Panel D:** Column AC **Panels E,F:** Column Y **Panel G:** Column T	$\sum CVR$	$\sum_{k} CVR_k$	• Calculate curvature risk exposure with respect to curvature risk factor k (CVR_k), as defined in Annex 1. • Sum the derived values for CVR_k across **all** risk factors within a bucket.
	Panels B,C: Column AB **Panel D:** Column AD **Panels E,F:** Column Z **Panel G:** Column U	$\sum_{k} \max(CVR_k, 0)^2$	$\sum_{k} \max(CVR_k, 0)^2$	Calculate curvature risk exposure with respect to curvature risk factor k (CVR_k), as defined in Annex 1.
	Panels B,C: Column Z **Panel D:** Column AB **Panels E,F:** Column X **Panel G:** Column S	$\sum rho$	$\sum_{k} \sum_{k \neq l} \left(1_{\rho_{kl} = \rho_{kl}^{(+)}} \right) \rho_{kl} CVR_k CVR_l \varphi(CVR_k, CVR_l)$ With $1_{\rho_{kl}=z} = 1$ if $\rho_{kl} = z$	Calculate the cross sum of weighted sensitivities between different risk factors within each bucket, as defined in Annex 1. **Please note that only the cross sum of weighted sensitivities multiplied by the φ function must be reported, without multiplication by ρ_{kl}**

4.2   Panel H: Default risk: non-securitisations

Row	Column	Heading	Description
Panel H. Summary instructions for reporting of positions for default risk (non-securitisations)			
	F–Q	Net long and net short JTD amount in each category after offsetting(with LGD as in the SBA standard) under each category / Y / Z	Fill in the sum of the amounts of the positions in the same credit quality category in the relevant column depending on whether the position is long or short (Y) and on the type of the underlying (Z). Both long and short JTD amounts should be reported as *positive* numbers.

The capital amount is calculated automatically.

4.3   Panels I and J: Default risk: Securitisations (non-CTP), and CTP respectively.

Row	Column	Heading	Description
Panels I and J. Summary instructions for reporting of positions for default risk of securitisations (non-CTP) and CTP, respectively.			
	F-U	Bond equivalent market value (long and Short)	For cash positions the bond equivalent MV is the market value of a bond, while for derivatives the bond-equivalent market value is the notional amount minus the MV of the derivative, (e.g. Bond equivalent MV of CDS=Notional-MV of CDS). The reported amounts should be net of the offsetting procedure as specified in Annex 1, where long/short positions that are perfect replications by decomposition can be fully offset. As in all treatment of long and short positions for default risk, positions should be reported in terms of long or short the underlying credit (i.e. a long position is one in which a default results in a loss).
	F-U	Sec-IRBA/ERBA/SA Capital Charge	Fill in the long and short capital charges for each exposure, depending on the approach.
	X	Approach to be applied based on the hierarchy	Specify whether SFA, SSFA, or 1250% RW is to be applied to each exposure.

The capital amount is calculated automatically.

4.4   Panel J: Default risk CTP

Exposures in indices whose constituents overlap with a specified index in the QIS tables can be grouped together as part of the specified index family. For instance an iTraxx index such as the iTraxx High Vol that contains names that are in the iTraxx Europe index may be reported in the iTraxx Europe table. Positions in unrelated indices that are not specified in the reporting tables, however, should be reported in the sub-tables for *Other Indices* at the bottom of the CTP tables section.

For each of these other indices, the net-risk-weighted amount should be calculated separately by index. Those indices for which the net-risk-weighted amount is positive should be reported together in the sub-table "*Total of all other Indices for which net risk weighted amount is positive*". Analogously, those indices for which the net -risk-weighted amount is negative should be reported in the sub-table "*Total of all other Indices for which net risk weighted amount is negative*".

4.5   Panel K: Residual risks add-on

Row	Column	Heading	Description
Panel K.1. Summary instructions for reporting residual risk add-on by type of instrument			
	F	Notional	Fill in the sum of notionals by types of instruments.

Row	Column	Heading	Description
Panel K.2. Summary instructions for reporting residual risk add-on by type of risk			
	F	Notional	Fill in the sum of notionals by types of risks.

The total residual risk add-on is calculated automatically.

4.6 Panel L: Asset class level comparison of the risk measures based on the portfolio under model permission

This panel intends to compare the capital charges under the "Revised model", the "Current model" and the "SBA", asset class by asset class. Both the SBA and the current model are to be computed on the share of the trading book which will be subject to the revised internal models approach. In the "current model" column:

- The migration risk component in the current IRC model is to be summed together with the credit spread risk captured in the VaR and reported in the row "credit spread risk: non-securitisations".

- The default risk component of the current IRC model is to be reported in the "Default risk: non-securitisations" row.

Row	Column	Heading	Description
		Current model	Capital charge according to the current model, on the share of the trading book which will be subject to the revised internal models approach, by asset class.
		SBA	Capital charge according to the SBA, on the same share of the trading book, by asset class.

5. FRTB-Revised IMA

The instructions below relate to the "FRTB-Revised IMA" worksheet. This tab pertains to the internal models approach.

5.1 Panel A: Reporting Dates

This panel collects the reporting date for each data point provided in the worksheet. Banks are free to decide on which date they want to start reporting data. **The longest time series available should be reported**. Ideally, 120 days of historical look-back period would be used. This means T should ideally be 31 December 2014. If banks have data available only from 30 June 2015, they should set T at that date and populate remaining columns with as much data is possible from that date onwards.

Row	Column	Heading	Description
23	E-DT	Date	Date that entries in this column of the worksheet relate to.

5.2 Panel B: Internal models – liquidity adjusted expected shortfall plus non-modellable risk factors

This panel collects data on the liquidity-adjusted expected shortfall (including capital for non-modellable risk factors) at a desk level. For the purpose of the calculation, each trading desk should be considered as a separate entity (so no hedging or diversification benefit with other trading desks should be taken into account).

Row	Column	Heading	Description
27-126	C	Description (name internally used)	The text reported here should be the name internally used for referring to the trading desk reported on that row.
27-126	D	Description (regulatory trading desk name)	One item in the list box of these cells should be selected. The list comes from the "stylised example of 'trading desk' structure". The item selected should be the one which best describes the reported trading desk.
27-126	E-DT	Liquidity adjusted expected shortfall plus non-modellable risk factors	For the reporting date in row 23, the desk-level expected shortfall (ES) plus the sum of capital requirements emerging from the stress scenario add-ons under the non-modellable risk factors framework. The ES calculated for the desk should factor in varying liquidity horizons in risk factors, but be defined before any regulatory multipliers (eg those imposed as a result of poor backtesting performance).

5.3   Panel C: Standardised approach – enhanced delta plus method, and residual risks add-on

This panel collects data on the standardised approach (excluding the default risk charge) at a desk level. For the purpose of the calculation, each trading desk should be considered as a separate entity (so no hedging or diversification benefit with other trading desks should be taken into account).

Row	Column	Heading	Description
130-229	C	Description (name internally used)	The text here will be automatically taken from entries in panel A.
130-229	D	Description (regulatory trading desk name)	The text here will be automatically taken from entries in panel A.
130-229	E-DT	Standardised approach – enhanced delta plus method, and residual risks add-on	For the reporting date in row 23, the desk-level enhanced delta plus risk charge plus the residual risks add-on.

5.4   Panel D: Internal models – default risk charge

This panel collects data on the internal model default risk charge at a desk level. For the purpose of the calculation, each trading desk should be considered as a separate entity (so no hedging or diversification benefit with other trading desks should be taken into account).

Row	Column	Heading	Description
233-332	C	Description (name internally used)	The text here will be automatically taken from entries in panel A.
233-332	D	Description (regulatory trading desk name)	The text here will be automatically taken from entries in panel A.
233-332	E-DT	Internal models – default risk charge	For the reporting date in row 23, the desk-level internal model default risk charge.

5.5   Panel E: Standardised approach – default risk charge

This panel collects data on the standardised approach default risk charge at a desk level. For the purpose of the calculation, each trading desk should be considered as a separate entity (so no hedging or diversification benefit with other trading desks should be taken into account).

Row	Column	Heading	Description
336-435	C	Description (name internally used)	The text here will be automatically taken from entries in panel A.
336-435	D	Description (regulatory trading desk name)	The text here will be automatically taken from entries in panel A.
336-435	E-DT	Standardised approach – default risk charge	For the reporting date in row 23, the desk-level standardised approach default risk charge.

5.6 Panel F: 1-day 99% VaR

The proposed backtesting framework requires hypothetical and actual profit and loss figures to be compared to the 99% and 97.5% VaR figures at a trading desk level and the firm-wide level. This panel collects the 1-day 99% VaR at desk level and firm-wide level.

Row	Column	Heading	Description
439-538	C	Description (name internally used)	The text here will be automatically taken from entries in panel A.
439-538	D	Description (regulatory trading desk name)	The text here will be automatically taken from entries in panel A.
439-538	E-DT	1-day 99% VaR (desk level)	For the reporting date in row 23, the one-day VaR with a 99% confidence interval for that desk.
539	E-DT	1-day 99% VaR (firm-wide level)	For the reporting date in row 23, the one-day VaR with a 99% confidence interval for the entire firm-wide portfolio.

5.7 Panel G: 1-day 97.5% VaR

This panel collects the 1-day 97.5% VaR at desk level and firm-wide level.

Row	Column	Heading	Description
543-642	C	Description (name internally used)	The text here will be automatically taken from entries in panel A.
543-642	D	Description (regulatory trading desk name)	The text here will be automatically taken from entries in panel A.
543-642	E-DT	1-day 97.5% VaR (desk level)	For the reporting date in row 23, the one-day VaR with a 97.5% confidence interval for that desk.
643	E-DT	1-day 97.5% VaR (firm-wide level)	For the reporting date in row 23, the one-day VaR with a 97.5% confidence interval for the entire firm-wide portfolio.

5.8 Panel H: Actual P&L

This panel collects the 1 day profit or loss, with the impact of fees and commissions removed, at a desk level and firm-wide level.

Row	Column	Heading	Description
647-746	C	Description (name internally used)	The text here will be automatically taken from entries in panel A.
647-746	D	Description (regulatory trading desk name)	The text here will be automatically taken from entries in panel A.
647-746	E-DT	Actual P&L (desk level)	For the reporting date in row 23, the one-day profit or loss for that desk with the impact of fees and commissions removed.
747	E-DT	Actual P&L (firm-wide level)	For the reporting date in row 23, the one-day profit or loss at the firm-wide level with the impact of fees and commissions removed.

5.9   Panel I: Hypothetical P&L

This panel collects the 1 day profit or loss based on the assumption that positions did not change from the end of the previous day, at a desk level and firm-wide level.

Row	Column	Heading	Description
751-850	C	Description (name internally used)	The text here will be automatically taken from entries in panel A.
751-850	D	Description (regulatory trading desk name)	The text here will be automatically taken from entries in panel A.
751-850	E-DT	Hypothetical P&L (desk level)	For the reporting date in row 23, the one-day hypothetical profit or loss for that desk.
851	E-DT	Hypothetical P&L (firm-wide level)	For the reporting date in row 23, the one-day hypothetical profit or loss at the firm-wide level.

5.10   Panel J: Risk-theoretical P&L

This proposed P&L attribution framework requires banks to calculate the theoretical P&L (i.e. the daily desk-level P&L that would be produced by the movement in the value of the risk factors included in the desk's risk management model). This is then compared to the hypothetical P&L. This panel collects the risk-theoretical P&L data at desk level.

Row	Column	Heading	Description
855-954	C	Description (name internally used)	The text here will be automatically taken from entries in panel A.
855-954	D	Description (regulatory trading desk name)	The text here will be automatically taken from entries in panel A.
855-954	E-DT	Risk-theoretical P&L (firm-wide level)	For the reporting date in row 23, the risk-theoretical profit or loss for that desk.

6.   CVA-Top 50

The "CVA – Top 50" worksheet gathers information on capital charges under the proposed revised CVA framework for the bank's 50 largest counterparties of all types (selected based on the criteria set out in section 1.3.2). All participating banks are requested to complete this worksheet.

6.1   Panel A: General data about counterparties selected

This panel collects data on the counterparties included in this worksheet. Columns I, J and K should only be completed for banks using the FRTB-CVA framework.

Row	Column	Heading	Description
14-63	B	Counterparty identifier	The identifier of the counterparty. Reporting banks may use their internal identifier codes, or a random identifier, as long as this is done consistently and is non-duplicative (no two different counterparties should have the same identifier).
14-63	C	Counterparty type	The type of counterparty based on the sectors set out in General Information, Panel E. (i.e. one of Banks, Other financials, Non-financials, Sovereigns, Others)
14-63	D	Margined/Unmargined portfolios	The possible options are: Margined, Unmargined, Mixed. A margined netting is a netting set for which there is a periodic exchange of collateral connected to the mark-to-market movements of the trades. An unmargined netting set is a netting set for which there is no exchange of collateral connected to either the mark-to-market movements or the potential future exposure of the trades. Where reporting banks have either have multiple netting agreements with a counterparty, some of which are margined and some are unmargined, or have a single netting agreement for which only some trades are margined, such counterparties should be reported as having "Mixed" margined/unmargined portfolios.
14-63	E	Accounting CVA	The unilateral CVA based on internal calculations that would be recognised for accounting purposes
14-63	F	Regulatory rating	Rating of the counterparty used for regulatory purposes (external or internal) Where possible, ratings should be mapped to the credit rating scale used by S&P/Fitch, rather than providing an alternative scale e.g. used internally or by Moodys.
14-63	G	Internal PD (if used in Standardised Approach)	Internally estimated PD of the counterparty if used in the Standardised Approach. Leave this column blank if internal PDs are not used for calculating Standardised CVA.
14-63	H	Advanced/Standardised approach for capital requirements	The approach used for calculating regulatory CVA risk capital charges relating to this counterparty under the current Basel III approaches. The possible options are: Advanced, Standardised, Both. The answer in this column should be consistent with the calculation provided in column I.
14-63	I	Current regulatory CVA	The regulatory CVA amount calculated according to the advanced approach under Basel III framework (ie the formula in paragraph 98 of the revised Annex 4 under Basel III). This column should only be completed by banks that are completing sections on FRTB-CVA (including where banks are only completing part of the FRTB CVA sections).
14-63	J	Revised regulatory CVA (Option A)	Revised regulatory CVA amount using the accounting exposure model. This column should only be completed by banks that are completing the sections on FRTB-CVA.
14-63	K	Revised regulatory CVA (Option B)	Revised regulatory CVA amount using the IMM exposure model. This column should only be completed by banks that are completing the sections on FRTB-CVA.

6.2   Panel B: Breakdown of Basel III CVA risk charge for counterparties selected

This section provides a split of the current regulatory CVA risk capital charge relating to the 50 counterparties reported in this worksheet, splitting into the two current Basel III approaches. Rows 69 and 70 should only be completed for banks using the Basel III advanced approach.

Row	Column	Heading	Description
69	B, D	Non-stressed CVA VaR under the advanced approach	The non-stressed CVA VaR value that is calculated under the current advanced approach
70	B, D	Stressed CVA VaR under the advanced approach	The stressed CVA VaR value that is calculated under the current advanced approach
71	B-E	Capital charge	The regulatory CVA risk capital charges amount using the relevant Basel III approach. Where possible, the regulatory CVA risk capital charge reported in this column should be calculated using the Revised version of the Basel III capital rules reflecting the CVA modification published 1 June 2011, as opposed to the version implemented by the reporting bank's national supervisory agency.
69-71	B-C	With single name credit hedges	Values including the effects of single name hedges that may be recognised as eligible hedges under the Basel III framework. Credit index hedges should be excluded from this calculation.
69-71	D-E	Without hedges	Values excluding the effects of credit indices and single name hedges that may be recognised as eligible hedges under the Basel III framework.

6.3   Panel C: Breakdown of proposed revised CVA risk charge for counterparties selected

This section asks reporting banks to complete information relating to portfolios for the counterparties on this worksheet.

6.3.1   Panel C.1: BA-CVA approach

This Panel provides information relating to the proposed Basic Approach CVA Risk charge. Reporting banks that will not be using the FRTB-CVA approaches should complete this section for all of the relevant counterparties selected in Panel A. All reporting banks that will be using the FRTB-CVA approaches should also complete this section for all of the relevant counterparties selected in Panel A, to facilitate comparison of the FRTB-CVA approaches with the BA-CVA approach.

Index hedges should be excluded from the calculations in this section.

Row	Column	Heading	Description
79	B	Capital charge under the BA-CVA approach, using CEM/IMM	Total capital charge under the BA-CVA approach for the counterparties included in this worksheet, using EADs calculated under either CEM or IMM. Index hedges should be excluded from this calculation.
79	C	Capital charge under the BA-CVA approach, using SA-CCR/IMM	Total capital charge under the BA-CVA approach for the counterparties included in this worksheet, using EADs calculated under SA-CCR or IMM. Index hedges should be excluded from this calculation.
83-132	B	Counterparty identifier	The text here will be automatically taken from entries in panel A of this section.
83-132	C	Risk Bucket	Report the Risk Bucket (sectors) in line with the Basic approach that the particular counterparty would be assigned to.
83-132	D	Grade	Report in this column the Grade that this counterparty is assigned. The possible responses are: Investment Grade, Speculative Grade or Non-Rated.
83-132	E	Σ M*EAD using CEM/IMM	The sum across netting sets of EAD (calculated using the current methods banks already use for the calculation of the relevant exposures, either IMM, SM or CEM) of each netting set multiplied by the effective maturity of that netting set. This amount is the "un-risk weighted" amount, and without dividing by the alpha conversion factor to convert EAD back into EEPE; this amount should ignore the effect of single-name hedges. EAD amounts should not be understood here as being 'outstanding EAD', ie they should not recognise any incurred CVA amounts.
83-132	F	Σ M*EAD using SA-CCR/IMM	The sum across netting sets of EAD (calculated using SA-CCR for netting sets currently under either SM or CEM, and IMM otherwise) of each netting set multiplied by the effective maturity of that netting set. This amount is the "un-risk weighted" amount, and without dividing by the alpha conversion factor to convert EAD back into EEPE; this amount should ignore the effect of single-name hedges. EAD amounts should not be understood here as being 'outstanding EAD', ie they should not recognise any incurred CVA amounts.
83-132	G, H	Single name eligible hedges referencing the counterparty directly	Parameters for single name hedges referencing the counterparty directly
83-132	I, J	Single name hedges referencing entities that are legally-related to the counterparty	Parameters for single name hedges referencing an entity that is legally related to the counterparty
83-132	K, L	Single name hedges sharing sector and region with counterparty	Parameters for single name hedges referencing an entity that belongs to the same sector or region as the counterparty
83-132	G, I, K	Σ M *B	The sum of multiples of remaining maturity of the single-name hedge and discounted notional of the hedge

Row	Column	Heading	Description
83-132	H, J, L	Σ (M *B)^2	The sum of squares of multiple of remaining maturity of the single-name hedge and discounted notional of the hedge

6.3.2 Panel C.2.1: IMA-CVA approach (Option A: accounting based exposures)

This panel provides information relating to the proposed IMA Approach CVA Risk charge using the accounting-based exposure measure. All reporting banks that complete the FRTB-CVA section and expect to use the IMA-CVA approach are asked to complete this section for all of the relevant counterparties selected in this worksheet.

Row	Column	Heading	Description
141-148	B, C	Without hedges	Values without the effect of eligible hedges (credit and expected exposure hedges).
141-148	D, E	With hedges	Values taking into account the effect of eligible hedges (credit and expected exposure hedges).
141-148	B, D	Option 1 for liquidity horizon	Option 1 as specified in the proposed framework text, i.e. using the FRTB liquidity horizons for credit spreads of liquid counterparties and the systematic components of credit spreads of illiquid counterparties.
141-148	C, E	Option 2 for liquidity horizon	Option 2 as specified in the proposed framework text, i.e. using 60-day liquidity horizons for credit spreads of liquid counterparties and the idiosyncratic components of credit spreads of illiquid counterparties.
141	B-E	Expected Shortfall (diversified)	The fully diversified, stressed expected shortfall with no supervisory constraints on cross risk type correlations.
142	B-E	Expected Shortfall for Counterparty credit spread risk	The partial stressed expected shortfall value for counterparty credit spread risk.
143	B-E	Expected Shortfall for Interest rate risk	The partial stressed expected shortfall value for interest rate risk.
144	B-E	Expected Shortfall for Equity risk	The partial stressed expected shortfall value for equity risk.
145	B-E	Expected Shortfall for Commodity risk	The partial stressed expected shortfall value for commodity risk.
146	B-E	Expected Shortfall for Credit spread risk of reference	The partial stressed expected shortfall value for credit spread risk of the reference entity.
147	B-E	Expected Shortfall for FX risk	The partial stressed expected shortfall value for FX risk.
148	B-E	Capital charge under the IMA-CVA approach	Total IMA capital charge calculated assuming w=0.5 (as per the draft Accord text) and inputs from rows 141-147.

6.3.3 Panel C.2.2: IMA-CVA approach (Option B: IMM-based exposures)

This panel provides information relating to the proposed IMA Approach CVA Risk charge using the IMM-based exposure measure. All reporting banks that complete the FRTB-CVA section and expect to use the IMA-CVA approach are asked to complete this section for all of the relevant

counterparties selected in Panel A of this work-sheet. Therefore reporting banks that complete Panel C.2.1 are expected to also complete C.2.1 (and vice versa).

Banks should complete this section using the same instructions as for Panel C.2.1 (Option A)

6.3.4   Panel C.3.1: SA-CVA approach (Option A: accounting based exposures)

This section provides a detailed breakdown of the proposed FRTB standardised approach CVA risk charge. All reporting banks that will complete the FRTB-CVA section (including those that expect to use the IMA-CVA approach) are asked to complete this section for all of the relevant counterparties selected in Panel A of this worksheet.

6.3.4.1   Panel C.3.1 (i): Breakdown of capital requirements for CVA risks under SA-CVA

This panel provides an overview of the capital charges under the proposed FRTB standardised approach CVA risk charge.

Row	Column	Heading	Description
170	B, C	Capital charges under the SA-CVA approach	Total capital charges using the SA-CVA approach
170	B	Option 1 for liquidity horizon	Total capital charges assuming Option 1 for liquidity horizons of counterparty credit risk
170	C	Option 2 for liquidity horizon	Total capital charges assuming Option 2 for liquidity horizons of counterparty credit risk

Row	Column	Heading	Description
175-181	B	Delta risks: Option 1 for liquidity horizon	Delta risk capital charges using liquidity horizon option 1
175-181	C	Delta risks: Option 2 for liquidity horizon	Delta risk capital charges using liquidity horizon option 2
175-181	D	Vega risks	Vega risk capital charges
175	B-D	Interest rates	Capital charges for delta and vega risk for interest rate
176	B-D	Foreign exchange	Capital charges for delta and vega risk for FX
177	B-D	Counterparty credit spread	Capital charges for delta risk for counterparty credit spread
178	B-D	Reference credit spread	Capital charges for delta and vega risk for reference credit spread
179	B-D	Equity	Capital charges for delta and vega risk for equity
180	B-D	Commodity	Capital charges for delta and vega risk for commodity
181	B-D	Total risks	The sum of all risk types (rows 175 – 180)

6.3.4.2   Panel C.3.1 (ii): General interest rate risk (GIRR)

This panel provides a breakdown of capital requirements for General interest rate risk.

Row	Column	Heading	Description
188-217	B	Currency	Where reporting banks have CVA sensitivities to currencies that are not listed in the template, they should use the yellow cells in rows 193-217 to add them, identifying the currency via the three-character ISO code of that currency.
188-217	C-M	Delta risks	Elements of the Delta risk capital charge calculation
188-217	N-X	Vega risks	Elements of the Vega risk capital charge calculation
188-217	C, N	Kb	Kb calculated separately for Delta risk and Vega risk
188-217	D-H, O-S	CVA ΣS	The aggregate (un-weighted) sensitivity of the aggregate CVA for a given risk type and bucket
188-217	I-M, T-X	Hedges ΣS	The aggregate (un-weighted) sensitivity of the all eligible hedges for a given risk type and bucket
188-217	D-F, I-K, O-Q, T-V	Maturities	The sensitivities relating to particular sections of the yield curve.
188-217	G, L, R, W	Parallel	The sensitivities to changes to the entire yield curve, using a 1 basis point parallel shift for delta risk.
188-217	H, M, S, X	Inflation	The sensitivities relating to the relevant inflation rate.

6.3.4.3   Panel C.3.1 (iii): Reference Credit Spread (CSR)

This panel provides a breakdown of capital requirements for reference credit spread risk.

Row	Column	Heading	Description
225-237	D	Sector	Sectors that define the buckets for the CSR capital charge calculation
225-237	F-H	Delta risks	Elements of the Delta risk capital charge calculation
225-237	I-K	Vega risks	Elements of the Vega risk capital charge calculation
225-237	F, I	Kb	Kb calculated separately for Delta risk and Vega risk
225-237	G, J	CVA ΣS	The aggregate (un-weighted) sensitivity of the aggregate CVA for a given risk type and bucket
225-237	H, K	Hedges ΣS	The aggregate (un-weighted) sensitivity of the all eligible hedges for a given risk type and bucket

6.3.4.4   Panel C.3.1 (iv): Equity risk

This panel provides a breakdown of capital requirements for equity risk.

Row	Column	Heading	Description
243-253	C-E	Size, Region, Sector	Criteria defining the buckets for equity risk capital charges
243-253	F-H	Delta risks	Elements of the Delta risk capital charge calculation
243-253	I-K	Vega risks	Elements of the Vega risk capital charge calculation
243-253	F, I	Kb	Kb calculated separately for Delta risk and Vega risk
243-253	G, J	CVA Σ S	The aggregate (un-weighted) sensitivity of the aggregate CVA for a given risk type and bucket
243-253	H, K	Hedges Σ S	The aggregate (un-weighted) sensitivity of the all eligible hedges for a given risk type and bucket

6.3.4.5 Panel C.3.1 (v): Commodity risk

This panel provides a breakdown of capital requirements for commodity risk.

Row	Column	Heading	Description
260-270	C	Sector	Sector defining the buckets for the commodity risk capital charge
260-270	F-H	Delta risks	Elements of the Delta risk capital charge calculation
260-270	I-K	Vega risks	Elements of the Vega risk capital charge calculation
260-270	F, I	Kb	Kb calculated separately for Delta risk and Vega risk
260-270	G, J	CVA Σ S	The aggregate (un-weighted) sensitivity of the aggregate CVA for a given risk type and bucket
260-270	H, K	Hedges Σ S	The aggregate (un-weighted) sensitivity of the all eligible hedges for a given risk type and bucket

6.3.4.6 Panel C.3.1 (vi): Foreign exchange risk

This panel provides a breakdown of capital requirements for FX risk.

Row	Column	Heading	Description
278-308	B	Currency	Currency defining the buckets for the FX risk capital charge
278-308	F-H	Delta risks	Elements of the Delta risk capital charge calculation
278-308	I-K	Vega risks	Elements of the Vega risk capital charge calculation
278-308	F, I	Kb	Kb calculated separately for Delta risk and Vega risk
278-308	G, J	CVA Σ S	The aggregate (un-weighted) sensitivity of the aggregate CVA for a given risk type and bucket
278-308	H, K	Hedges Σ S	The aggregate (un-weighted) sensitivity of the all eligible hedges for a given risk type and bucket

6.3.4.7 Panel C.3.1 (vii): Counterparty credit spread risk (CSR)

This panel provides a breakdown of capital requirements for counterparty credit spread risk.

Row	Column	Heading	Description
315-364	B	Counterparty identifier	The text here will be automatically taken from entries in panel A of this section
315-364	C	Bucket	Bucket number for the counterparty (as defined in the counterparty credit spread risk capital charge approach)
315-364	D	Credit Quality	Credit quality of the counterparty (Investment grade, high yield, or non-rated)
315-364	E	Sector	Industry sector of the counterparty
315-364	F-J	CVA S	The counterparty-specific CVA credit spread risk sensitivity of the counterparty.
315-364	K-O	Hedges S	The counterparty-specific credit spread risk sensitivities of eligible hedges for the counterparty.

Row	Column	Heading	Description
371-383	B	Bucket	Bucket number for the counterparties (as defined in the counterparty credit spread risk capital charge approach)
371-383	C	Credit quality	Credit quality of the counterparties (Investment grade, high yield, or non-rated)
371-383	D	Sector	Industry sector of the counterparties
371-383	E	Kb	The aggregated capital charge for counterparty credit spread risk for those 50 counterparties within a particular bucket.

6.3.4.8 Panel C.3.2: Breakdown of proposed revised CVA risk charge for counterparties selected: SA-CVA approach (Option B: IMM based exposure)

Banks should complete this section using the same instructions as for Panel C.3.1: SA-CVA approach (Option A: Accounting based exposure).

7. CVA-Bank

This section shall only be completed by participating banks that would implement any of the approaches defined under the FRTB-CVA framework.

Banks should complete this worksheet with data based on their largest margined bank counterparty with quoted CDS (largest determined by considering the absolute amount of regulatory CVA that firms compute against that counterparty; CVA hedges should be excluded from this calculation).

Banks should complete this worksheet using the same instructions as for CVA-Top 50.

8. CVA-Sovereign, Liquid

This section shall only be completed by participating banks that would implement any of the approaches defined under the FRTB-CVA framework.

Banks should complete this worksheet with data based on their 5 largest unmargined sovereign counterparties with quoted CDS (largest determined by considering the absolute amount of regulatory CVA that firms compute against that counterparty; CVA hedges should be excluded from this calculation).

Banks should complete this worksheet using the same instructions as for CVA-Top 50.

9.   CVA-Sovereign, Illiquid

This section shall only be completed by participating banks that would implement any of the approaches defined under the FRTB-CVA framework.

Banks should complete this worksheet with data based on their 5 largest unmargined sovereign counterparties without quoted CDS (largest determined by considering the absolute amount of regulatory CVA that firms compute against that counterparty; CVA hedges should be excluded from this calculation).

Banks should complete this worksheet using the same instructions as for CVA-Top 50.

10.   CVA-Non-bank Financial, Liquid

This section shall only be completed by participating banks that would implement any of the approaches defined under the FRTB-CVA framework.

Banks should complete this worksheet with data based on their 5 largest margined non-bank financial counterparties with quoted CDS (largest determined by considering the absolute amount of regulatory CVA that firms compute against that counterparty; CVA hedges should be excluded from this calculation).

Banks should complete this worksheet using the same instructions as for CVA-Top 50.

11.   CVA-Non-bank Financial, Illiquid

This section shall only be completed by participating banks that would implement any of the approaches defined under the FRTB-CVA framework.

Banks should complete this worksheet with data based on their 5 largest margined non-bank financial counterparties without quoted CDS (largest determined by considering the absolute amount of regulatory CVA that firms compute against that counterparty; CVA hedges should be excluded from this calculation).

Banks should complete this worksheet using the same instructions as for CVA-Top 50.

12.   CVA-Corporate, Liquid

This section shall only be completed by participating banks that would implement any of the approaches defined under the FRTB-CVA framework.

Banks should complete this worksheet with data based on their 5 largest unmargined corporate counterparties with quoted CDS (largest determined by considering the absolute amount of regulatory CVA that firms compute against that counterparty; CVA hedges should be excluded from this calculation).

Banks should complete this worksheet using the same instructions as for CVA-Top 50.

13. CVA-Corporate, Illiquid

This section shall only be completed by participating banks that would implement any of the approaches defined under the FRTB-CVA framework.

Banks should complete this worksheet with data based on their 5 largest unmargined corporate counterparties without quoted CDS (largest determined by considering the absolute amount of regulatory CVA that firms compute against that counterparty; CVA hedges should be excluded from this calculation).

Banks should complete this worksheet using the same instructions as for CVA-Top 50.

Annex 1

Proposed market risk framework (July 2015)

This Annex sets out an updated draft of the revised Accord text for the market risk framework. With the exception of the proposed standardised approach (page 53), all changes to the draft Accord text in this Annex are set out in "tracked-change" format, for comparison with the version presented in the second consultative paper of the *Fundamental review of the trading book*, published in October 2013.[1]

The text herein is intended to replace the existing Basel market risk framework, including amendments made after the June 2006 publication of *Basel II: International Convergence of Capital Measurement and Capital Standards - Comprehensive Version*.

Contents

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[1]   Basel Committee on Banking Supervision, *Fundamental review of the trading book – second consultative document*, October 2013, www.bis.org/publ/bcbs265.htm.

Minimum capital requirements for market risk

A.   Definition of the trading book and risk measurement framework

1~~5~~.   Scope of application ~~and method~~ and methods of measuring market risk

1.   Market risk is defined as the risk of losses arising from movements in market prices. The risks subject to the market risk measurement framework ~~are~~include but are not limited to:

- Default risk, i~~I~~nterest rate risk, credit spread ~~and default~~ risk, equity risk, foreign exchange risk and commodities risk for covered instruments; and

- Foreign exchange risk and commodities risk for banking book instruments.

2.   The market risk capital charges apply to all covered instruments and to foreign exchange and commodities risk positions in the banking book.

~~2.~~3.   Banks must fair-value daily any covered instrument and recognise any valuation change in the profit and loss (P&L) account.

~~3.~~4.   In measuring ~~their~~its market risk~~s~~, a bank may choose~~choice~~ between two broad methodologies: the standardised approach and internal models approach for market risk (described in [paragraphs 709 to 718(Lxix) and 718(Lxx) to 718(xCix), respectively][2] ~~will be permitted~~, subject to the approval of the national authorities. ~~One alternative will be to measure the risks in a standardised manner, using the measurement frameworks described in [paragraphs 709 to 718(Lxix)][3] below.~~

~~4.~~5.   All transactions, including forward sales and purchases, shall be included in the calculation of capital requirements as o~~from~~ the date on which they were entered into. Although regular reporting will in principle take place only at intervals (quarterly in most countries ~~quarterly~~), banks are expected to manage the market risk in their trading book in such a way that the capital requirements are being met on a continuous basis, including at the close of each business day. Supervisory authorities have at their disposal a number of effective measures to ensure that banks do not "window-dress" by showing significantly lower market risk positions on reporting dates. Banks will also be expected to maintain strict risk management systems to ensure that intraday exposures are not excessive. If a bank fails to meet the capital requirements at any time, the national authority shall ensure that the bank takes immediate measures to rectify the situation.

~~5.~~6.   A matched currency risk position will protect a bank against loss from movements in exchange rates, but will not necessarily protect its capital adequacy ratio. If a bank has its capital denominated in its domestic currency and has a portfolio of foreign currency assets and liabilities that is completely matched, its capital/asset ratio will fall if the domestic currency depreciates. By running a short risk position in the domestic currency the bank can protect its capital adequacy ratio, although the risk position would lead to a loss if the domestic currency were to appreciate. Supervisory authorities are free to allow banks to protect their capital adequacy ratio in this way and exclude certain currency risk positions ~~. Thus, any risk positions which a bank has deliberately taken in order to hedge partially or totally against the adverse effect of the exchange rate on its capital ratio may be excluded~~ from the calculation of net open currency risk positions, subject to meeting each of the following conditions ~~being met~~:

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[2]   References to paragraphs in the existing Basel II Framework will be updated once the revised market risk framework is finalised by the Basel Committee.

- The risk position is taken for the purpose of hedging partially or totally against the potential that changes in exchange rates could have an adverse effect on its capital ratio;

- The maximum exclusion[4] is limited to:

    - investments in affiliated but not consolidated entities denominated in foreign currencies; or

    - investments in consolidated subsidiaries denominated in foreign currencies.

- The exclusion from the calculation is made for at least six months;

- Any changes in the amount is pre-approved by the national supervisor; and

- Any exclusion of the risk position needs to be applied consistently, with the exclusionary treatment of the hedge remaining in place~~the same~~ for the life of the assets or other items.

- Banks are required by national supervisors to document and have available for supervisory review the positions and amounts to be excluded from market risk capital requirements.

- ~~Such risk positions need to be of a "structural", ie of a non-dealing, nature (the precise definition to be set by national authorities according to national accounting standards and practices);~~

- ~~The national authority needs to be satisfied that the "structural" risk position excluded does no more than protect the bank's capital adequacy ratio;~~

~~6.~~7.   Risk positions~~Holdings~~ in~~of~~ the bank's own eligible regulatory capital instruments are deducted from capital. ~~Risk positions in~~Holdings of other banks', securities firms', and other financial entities' eligible regulatory capital instruments, as well as intangible assets, will receive the same treatment as that set down by the national supervisor for such assets held in the banking book, which in many cases is deduction from capital. Where a bank demonstrates that it is an active market-maker, then a national supervisor may establish a dealer exception for holdings of other banks', securities firms', and other financial entities' capital instruments in the trading book. In order to qualify for the dealer exception, the bank must have adequate systems and controls surrounding the trading of financial institutions' eligible regulatory capital instruments. ~~Risk positions for~~Holdings of capital instruments ~~which~~ that are deducted or risk-weighted at 1250% are not allowed to be included in the market risk framework.

~~7.~~8.   ~~Term t~~Trading-related repo-style transactions that a bank accounts for in its banking book may be included in the bank's trading book for regulatory capital purposes so long as all such repo-style transactions are included. For this purpose, trading-related repo-style transactions are defined as only those that meet the requirements ~~of as~~ mentioned in paragraph~~s 4 and 5~~14, and both legs are in the form of either cash or securities which are eligible for inclusion in the trading book. Regardless of where they are booked, all other repo-style transactions are subject to a counterparty credit risk capital charge as required in other parts of the Capital Accord.

~~8.~~9.   In the same way as for credit risk and operational risk, the capital requirements for market risk ~~are to~~ apply on a worldwide consolidated basis. ~~Yet, for market risk national~~Supervisory authorities may permit banking and financial entities in a group which is running a global consolidated trading book and whose capital is being assessed on a global basis to include just the net ~~of~~ short and net long risk positions no matter where they are booked.[5] ~~National~~Supervisory authorities may grant this treatment only when the revised standardised approach permits a full offset of the risk position~~,~~ (ie risk positions of opposite sign do not attract a capital charge). Nonetheless, there will be circumstances in which

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[4]   For the purposes of the maximum exclusion, a bank must not include investments in branches denominated in foreign currencies.

[5]   The positions of less than wholly owned subsidiaries would be subject to the generally accepted accounting principles in the country where the parent company is supervised.

supervisory authorities demand that the individual risk positions be taken into the measurement system without any offsetting or netting against risk positions in the remainder of the group. This may be needed, for example, where there are obstacles to the quick repatriation of profits from a foreign subsidiary or where there are legal and procedural difficulties in carrying out the timely management of risks on a consolidated basis. Moreover, all ~~national~~ supervisory authorities will retain the right to continue to monitor the market risks of individual entities on a non-consolidated basis to ensure that significant imbalances within a group do not escape supervision. Supervisory authorities will be especially vigilant in ensuring that banks do not conceal risk positions on reporting dates in such a way as to escape measurement.

~~9.~~10.   For the time being, the Committee does not believe that it is necessary to allow any de minimis exemptions from the capital requirements for market risk, except for those for foreign exchange risk set out in [paragraph 718(xLii)][6] below, because ~~this~~the Basel Framework applies only to internationally active banks, and then essentially on a consolidated basis; all of these banks are likely to be involved in trading to some extent.

2~~1~~.   Definition of the trading book

~~10.~~11.   A trading book consists of all instruments that meet the specifications below ("covered instruments").

~~11.~~12.   Instruments comprise financial instruments and commodities. A financial instrument is any contract that gives rise to both a financial asset of one entity and a financial liability or equity instrument of another entity. Financial instruments include both primary financial instruments (or cash instruments) and derivative financial instruments. A financial asset is any asset that is cash, the right to receive cash or another financial asset or a commodity, or an equity instrument. A financial liability is the contractual obligation to deliver cash or another financial asset or a commodity. Commodities also include non-tangible (ie non-physical) goods such as electric power.

~~12.~~13.   Banks may only include an instrument or commodity in the trading book when there is no legal impediment against selling or fully hedging it.

~~13.~~14.   Any instrument a bank holds for one or more of the following intended purposes must be designated as a covered instrument:

(a)   ~~holds with the intention of~~ short-term resale;

(b)   ~~holds with the expectation of~~ profiting from ~~actual or expected~~ short-term price movements;

(c)   ~~holds with the intention of~~ locking in arbitrage profits; ~~or~~

(d)   ~~holds for the purpose of~~ hedging risks resulting from instruments meeting criteria a, b~~,~~ or c~~,~~ above.

(e)   holding~~is~~ a naked short credit or equity position, including any short position in cash instruments; or

(f)   giving~~es~~ rise to a net short credit or equity position in the banking book.[7]

~~14.~~15.   The~~re is a~~ general presumption ~~is~~ that any:[8]

(a)   instrument held as an accounting trading asset or liability~~,~~ (so it would be fair-valued daily through the profit and loss (P&L) account);[9]

(b)   instrument resulting from market-making activities (ie a bank that stands ready to buy and sell an instrument ~~security~~ on a regular and continuous basis at a publicly quoted price);

(c)   equity investment in a fund (excluding paragraph 21(e)~~13(d)~~);

(d)   listed equity;[10] or

(e)   option~~.~~[11]

(f)   instrument resulting from underwriting activities;

~~(f)   naked short position, including any short position in cash instruments; or~~

is being held for at least one of the purposes listed in paragraph 14 and therefore is a covered instrument.

16.   Supervisors may provide specific guidance on these general presumptions. ~~As it is possible there will be jurisdictional variance in terms of what should be presumed to be in included in the trading or banking book, each supervisor could provide specific guidance on this subject.~~ Banks will be expected to assign instruments to the appropriate boundary designation based on this guidance. If a bank believes that they have to deviate from the presumption list for a certain set of instruments, the bank must submit a request to its supervisor and receive explicit approval. In cases where this approval is not given by the supervisor, the instrument must be switched to the trading book.

~~15.~~17.   Any instrument which is not held or presumed to be held for any of the intended purposes listed in paragraph 14 at inception, or otherwise specified to be held in the trading book, must be assigned to the banking book.

~~16.   There is a strict limit on banks moving instruments between the trading book and the banking book at the choice of the bank after initial designation (see paragraphs 25–28 to).~~

~~17.~~18.   The supervisor may require the bank to designate an instrument to the banking book if the supervisor is of the view that a bank has not provided enough evidence to support the assignment of an instrument to the trading book, or if the supervisor believes such instruments would customarily belong in the banking book.

~~18.~~19.   The supervisor may require the bank to designate an instrument to the trading book if the supervisor is of the view that a bank has not provided enough evidence to support the assignment of an instrument to the banking book, or if the supervisor believes such instruments would customarily belong in the trading book.

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[8]   The presumptions for designation of an instrument to the trading book or banking book set out in this text will be used where a designation of an instrument to the trading book or banking book is not otherwise specified in this text.

[9]   Under IFRS and US GAAP, these instruments would be designated as "held for trading".

[10]   Subject to supervisory review, certain listed equities may be excluded from the market risk framework. Examples of equities that may be excluded include, but are not limited to, equity positions arising from deferred compensation plans, convertible debt securities, loan products with interest paid in the form of "equity kickers", equities taken as a debt previously contracted, bank-owned life insurance products, and legislated programmes. The set of listed equities that the bank wishes to exclude from the market risk framework should be made available to, and discussed with, the national supervisor and should be managed by a different desk from proprietary or ~~a~~ short-term buy/sell instruments.

[11]   An instrument which would normally be designated a banking book instrument, but which has an embedded option, eg a loan with an embedded prepayment option or interest cap, can be designated as a banking book instrument.

19.20.   Any instrument in the correlation trading portfolio, and any instrument which is managed on a trading desk as defined by the criteria set out in paragraphs 21 to 2361, is seen as being held for at least one of the intended purposes listed in paragraph 14 and therefore must be included in the trading book.

20.

21.   Any instrument which would lead to a net short risk position in an equity in the banking book is seen as being held for at least one of the purposes listed in paragraph 4 and therefore it must be included in the trading book.

22.21.   The Committee is of the view that Aany

(a)   unlisted equity;

(b)   instrument designated for securitisation warehousing;

(c)   real estate holding;

(c)(d)   retail and SME credit;[12]

(d)(e)   equity investment in a fund (including a hedge fund) where the bank cannot look through the fund daily or where the bank cannot obtain daily real prices for its equity investment in the fund; or

(f)   ederivative instrument with the above instrument types as underlying assets; or

(e)(g)   instrument held for the purpose of hedging a particular risk of a position in the above instrument types

does not meet the definition of the trading book, owing to significant constraints on the ability of banks to liquidate these positions and value them reliably on a daily basis. Moreover, the capital charges for the trading book are not designated to capture the risk of the above-mentioned instruments. Therefore these instruments should be assigned to the banking book, unless specifically provided otherwise in this text.

23.   Banks must fair-value daily any covered instrument and recognise any valuation change in the profit and loss (P&L) account.

24.22.   Banks must have clearly defined policies, procedures and documented practices for determining which instruments to include in, and to exclude from, the trading book for purposes of calculating their regulatory capital, ensuring compliance with the criteria set forth in this section and taking into account the bank's risk management capabilities and practices.

25.23.   Banks' internal control functions must conduct ongoing evaluation of instruments both in and out of the trading book, to assess whether the bank's instruments are being properly initially designated as trading or non-trading instruments in the context of the bank's trading activities. Compliance with the policies and procedures must be fully documented and subject to periodic (at least yearly) internal audit, and available for supervisory review.

26.24.   The treatment of internal transfers with the purpose of transferring risk between the banking book and the trading book, and their treatment under market risk capital requirements, is discussed in paragraphs 3738 to 39.

32.   Risk management policies for covered positionsinstruments

27.25.   Covered instruments must be subject to clearly defined policies and procedures, approved by senior management, that are aimed at ensuring active risk management. The application of the policies

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[12]   Please refer to Paragraph [231] of the current Basel framework for the definition of "retail and SME credit".

and procedures must be thoroughly documented. These policies and procedures should, at a minimum, address the subjects listed below:

(a) The activities the bank considers to be trading or hedging of covered instruments ~~and therefore constitutes elements of the trading book for regulatory capital purposes~~;

(b) Trading strategies (including expected holding horizon and possible reactions if this limit is breached) for every covered instrument or portfolio;

(c) Standards regarding the extent to which a bank's portfolio of covered instruments must be marked-to-market daily by reference to an active, liquid two-way market;

(d) For covered instruments that are marked-to-model, the standards for:

    (i) Identifying the material risks of the covered instruments;

    (ii) Hedging the material risks of the covered instruments and the extent to which hedging instruments would have an active, liquid two-way market; and

    (iii) Reliably deriving estimates for the key assumptions and parameters used in the model.

(e) The extent to which the bank is required to generate valuations for the covered instruments that can be validated externally in a consistent manner;

(f) The extent to which instruments may have operational requirements that could impede the bank's ability to effect an immediate liquidation of the covered ~~position~~instrument;

(g) The processes constituting active management of covered instruments, which must include:

    (i) The setting of limits and ongoing monitoring for appropriateness;

    (ii) The requirement that each trading desk ~~compile~~ have a documented trading strategy and the process for monitoring covered instruments against the bank's trading strategy, including that:

        o for any given trading desk, bank senior management assume~~s~~ the responsibility that a given covered instrument or portfolio is managed with trading intent and in accordance with the trading strategy document.

        o the monitoring process include~~s~~ evaluation of turnover and "stale positions" in order to determine compliance with specified holding periods.

    (iii) The degree of autonomy a trader has to enter into or manage covered instruments within agreed limits and according to the agreed strategy;

    (iv) The process for reporting to senior management as an integral part of the institution's risk management process; and

    (v) The active monitoring of instruments and risk positions with reference to market information sources, including:

        o Assessment of market liquidity and the ability to hedge instruments, risk positions or the portfolio risk profile;

        o Analysis of changes in the market values of instruments and sensitivities due to changes in market risk factors; and

        o Evaluation of the quality and availability of market inputs with respect to the valuation process, the level of market turnover, and the relative size of instruments traded in the market.

~~28.~~26. With regard to instruments ~~which~~ that are generally presumed to be included in the trading book (see paragraph 15~~11~~), the following requirements apply:

Instructions: Impact study on the proposed frameworks for market risk and CVA risk

(a)   Banks need to have policies and procedures that ~~specify~~ justify potential deviations from the general presumptions. These must be regularly updated and satisfy the supervisor.

(b)   Any actual deviation from the general presumptions must be in line with the bank's policies and procedures.

(c)   Banks need to document any actual deviations from the general presumptions in detail, in a timely manner (ie, within the reporting period)~~,~~ and report the nature and extent of these deviations to their supervisor.

4~~3~~.   Definition of the trading desk

~~29.~~27.   ~~A key component of calculating market risk capital charges is the identification and classification of a bank's "trading desks".~~ For the purposes of market risk capital calculations, a trading desk is a group of traders or trading accounts that implements a well-defined business strategy operating within a clear risk management structure.

~~30.~~28.   Trading desks are defined by the bank, but subject to the regulatory approval of the supervisor for capital purposes. Within this supervisory-approved desk structure, banks may further define operational sub-desks without the need for supervisory approval. These sub-desks would be for internal operational purposes only and would not be used in the market risk capital framework.

~~31.~~29.   The key attributes of trading desks are as follows:

(a)   A trading desk for the purposes of the regulatory capital charge is an unambiguously defined group of traders or trading accounts. Each individual trader or trading account must be assigned to only one trading desk.

(b)   The desk must have a clear reporting line to senior management and must have a clear and formal compensation policy linked to its pre-established objectives.

(c)   A trading desk must have a well-defined and documented business strategy, including an annual budget and regular management information reports (including revenue, costs and risk-weighted assets).

(d)   A trading desk must have a clear risk management structure. This must include clearly defined trading limits based on the business strategy of the desk. The desk must also produce, at least weekly, appropriate risk management reports. This would include, at a minimum, profit and loss reports and internal and regulatory risk measurement reports.

(e)   Internal hedges between trading desks are recognised under the market risk capital rules. There must be no distinction between the prudential treatment of internal trades (ie trades entered between defined trading desks) and external trades.

(f)   Further detail around the definition of a trading desk for regulatory capital purposes is provided in Appendix A.

~~32.~~30.   ~~In addition to policies and procedures,~~ T~~t~~he bank must prepare, evaluate, and have available for supervisors the following for all trading desks:

(a)   Inventory ageing reports;

(b)   Daily limit reports including exposures, limit breaches and follow-up action;

(c)   Reports on intraday limits and respective utilisation and breaches for banks with active intraday trading; and

(d)   Reports on the assessment of market liquidity.

33.31.   Any foreign exchangeFX or commodity positions held in the banking book will be included in the market risk capital charges. For regulatory capital calculation purposes, these positions will be treated as if they were held in notional trading desks within the trading book.

54.   Restrictions on moving instruments between the regulatory books

34.32.   There is a strict limit on the ability of banks to move instruments between the trading book and the banking book atby their own choice after initial designation. In practice, switching should be rare and is allowed only in extraordinary circumstances. Possible examples could be a major publicly announced event, such as a bank restructuring that results in permanent closure of trading desks or a change in accounting standards that allow an item to be fair-valued through the P&L. In this regard switching always requires termination of the business activity applicable to the instrument or portfolio. Market events, changes in the liquidity of a financial instrument or a change of trading intent alone are not valid reasons for re-designating an instrument to a different book. When switching positions, banks must ensure that the conditions of paragraph 4 and 514 are met and must provide respective supporting documentation to their supervisor.

35.33.   Switching instruments for regulatory arbitrage is strictly prohibited, and the capital benefit as a result of switching will not be allowed. This means that the bank must determine its total capital charge (across banking book and trading book) before and immediately after the switch. If this capital charge is reduced as a result of this switch, the difference as measured at the time of the switch will beis imposed on the bank as a disclosed Pillar 1 capital surcharge. This surcharge will be allowed to run off as the positions mature or expire, in a manner agreed with the supervisor. To maintain operational simplicity, it is not envisaged that this additional charge would be recalculated on an ongoing basis although the positions would continue to be subject to the ongoing capital requirements of the book into which they have been switched.

36.34.   Any re-designation between books must be approved by senior management, thoroughly documented, determined by internal review to be in compliance with the bank's policies, approved by the supervisor, and publicly disclosed. Any such re-designation is irrevocable. If an instrument is reclassified to now be an accounting trading asset or liability there is a presumption (paragraph 15(a)) that this instrument is in the trading book; therefore in this case an automatic switch without approval of the supervisor is acceptable.

37.35.   A bank must adopt relevant policies, which must be updated at least yearly. Updates should be based on an analysis of all extraordinary events identified during the previous year. Updated policies with changes highlighted must be sent to the appropriate supervisor. Policies must include the following:

(a)   The above transfer restriction requirements in paragraphs [32 to 345], especially the restriction that transfers may only be allowed in extraordinary circumstances, and a description of the circumstances or criteria where such a transfer may be considered.

(b)   The process for obtaining senior management and supervisory approval of such a transfer.

(c)   How a bank identifies an extraordinary event.

(d)   A requirement that transfers into or out of the trading book be publicly disclosed at the earliest reporting date.

6.   Treatment of ~~hedges~~internal risk transfers ~~between the banking book and the trading book~~[13]

~~38.~~36.   Inter-desk risk transfers among trading desks within the scope of application of the market risk capital charges (including foreign exchange risk and commodities risk in the banking book) will receive regulatory capital recognition.

37.   There will be no regulatory capital recognition for internal risk transfers from the trading book to the banking book. For internal risk transfers (IRTs) from the banking book to the trading book:

(a)   When a bank hedges a banking book credit risk exposure using a credit derivative ~~booked in~~purchased from its trading book (ie using an ~~internal hedge~~IRT), the banking book exposure is not deemed to be hedged for capital purposes unless the bank purchases from an eligible third-party protection provider a credit derivative ~~meeting~~ that exactly matches the IRT and meets the requirements of [paragraphs 191 to 194] vis-à-vis the banking book exposure. Where such third-party protection is purchased and is recognised as a hedge of a banking book exposure for regulatory capital purposes, neither the internal nor the external credit derivative hedge would be included in the trading book for regulatory capital purposes. Alternatively, the supervisory authority may require the entirety of each IRT recognised as a banking book hedge and exactly matched by the third-party external hedge, as well as the third-party external hedge, to be included in the market risk capital requirements. Where the requirements for eligible third-party protection and hedges of banking book exposures are not met, the third-party external hedge must be fully included in and the IRT must be fully excluded from the market risk capital requirements.

(b)   When a bank hedges a banking book equity risk exposure using a hedging instrument purchased from its trading book, the banking book exposure is not deemed to be hedged for capital purposes unless the bank purchases a hedging instrument from an eligible third-party protection provider that exactly matches the IRT and meets the requirements vis-à-vis the banking book exposure. Where such third-party protection is purchased and is recognised as a hedge of a banking book exposure for regulatory capital purposes, neither the internal nor the external hedge would be included in the trading book for regulatory capital purposes. Alternatively, the supervisory authority may require the entirety of each IRT recognised as a banking book hedge and exactly matched by the third-party external hedge, as well as the third-party external hedge, to be included in the market risk capital requirements. Where the requirements for eligible third-party protection and hedges of banking book exposures are not met, the third-party external hedge must be fully included in and the IRT must be fully excluded from the market risk capital requirements.

~~(e)~~(c)   **[GIRR Option 1]:** When a bank hedges banking book general interest rate risk (GIRR) exposure using an IRT with its trading book, the banking book exposure is not deemed to be hedged for capital purposes unless the bank purchases from an eligible third-party protection provider a hedging instrument that exactly matches the IRT and is deemed to be an eligible hedge for GIRR. Where such a third-party hedge is purchased and is recognised as a hedge of a banking book exposure for regulatory capital purposes, neither the internal nor the external hedge would be included in the trading book for regulatory capital purposes. Alternatively, the supervisory authority may require the entirety of each IRT recognised as a banking book hedge and exactly matched by the third-party external hedge, as well as the third-party external hedge, to be included in the market risk capital requirements. Where the requirements for eligible third-party protection and hedges of banking book exposures are not met, the third-

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[13]   References to paragraphs in the existing Basel II Framework contained in this section will be updated once the revised market risk framework is finalised by the Basel Committee.

party external hedge must be fully included in and the IRT must be fully excluded from the market risk capital requirements.

[GIRR Option 2]: When a bank hedges banking book GIRR exposure using an IRT with its trading book, the banking book exposure is not deemed to be hedged for capital purposes unless:

- the internal risk transfer is documented with respect to the banking book interest rate risk being hedged and the sources of such risk;

- the internal risk transfer is conducted with trading desks which have been specifically approved by the supervisor for this purpose; and

- it is a recognised type of hedge for a banking book interest rate risk exposure.

- All GIRR internal risk transfers from the banking book to the trading book, and any hedging instruments purchased from a third party to hedge the GIRR which is being transferred, must be aggregated in a distinct trading book portfolio. These IRTs, together with any external hedges of these IRTs, must be capitalised under the trading book market risk framework on a stand-alone basis, separate from any other interest rate risk generated by activities in the trading book.

  Where these conditions are met, the GIRR in the banking book that is hedged by the IRTs will be recognised as hedged for regulatory capital purposes.

39.38. Instruments which are used for internal risk transfers have to fulfil the same trading book requirements as for instruments transacted with external counterparties.

40.39. Eligible hedges that are included in the credit valuation adjustment (CVA) capital charge must be removed from the bank's market risk capital charge calculation.[14]

7. Treatment of counterparty credit risk in the trading book[15]

41.40. Banks will be required to calculate the counterparty credit risk charge for OTC derivatives, repo-style and other transactions booked in the trading book, separate from the capital charge for general market risk. The risk weights to be used in this calculation must be consistent with those used for calculating the capital requirements in the banking book. Thus, banks using the standardised approach for credit risk in the banking book will use the standardised approach risk weights in the trading book and banks using the IRB approach in the banking book will use the IRB risk weights in the trading book in a manner consistent with the internal ratings-based (IRB) roll out situation in the banking book as described in [paragraphs 256 to 262]. For counterparties included in portfolios where the IRB approach is being used the IRB risk weights will have to be applied.

42.41. In the trading book, fFor repo-style transactions in the trading book, all instruments, whicthat are included in the trading book, may be used as eligible collateral. Those instruments which fall outside the banking book definition of eligible collateral shall be subject to a haircut at the level applicable to non-main index equities listed on recognised exchanges (as noted in [paragraph 151]). However, where banks that are useing their own estimates approach to haircutting they may also apply it in the trading book in accordance with [paragraphs 154 and 155]. Consequently, for instruments that count as eligible collateral in the trading book, but not in the banking book, the haircuts must be calculated for each individual security. Where bBanks thatare useing a Value at Risk (VaR) approach to measureing exposure

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[14] The Basel Committee is considering further work on the treatment of CVA and CVA hedges, with a view to future consultation.

[15] References to paragraphs in the existing Basel II Framework contained in this section will be updated once the revised market risk framework is finalised by the Basel Committee.

for repo-style transactions,~~, they also~~ may apply this approach in the trading book in accordance with [paragraphs 178 to 181 (i) and Annex 4].

~~43.~~42.   The calculation of the counterparty credit risk charge for collateralised OTC derivative transactions is the same as the rules prescribed for such transactions booked in the banking book.

~~44.~~43.   The calculation of the counterparty charge for repo-style transactions will be conducted using the rules in [paragraphs 147 to 181 (i) and Annex 4] spelt out for such transactions booked in the banking book. The firm-size adjustment for SMEs as set out in [paragraph 273] shall also be applicable in the trading book.

8.   Transitional arrangements

[To be determined by the Committee.]

B.   The capital requirement

1.   Definition of capital[16]

~~45.~~44.   The definition of capital to be used for market risk purposes is set out in paragraphs [49(xiii) and 49(xiv) of this Framework].

~~46.~~45.   In calculating eligible capital, it will be necessary first to calculate the bank's minimum capital requirement for credit and operational risks, and only afterwards its market risk requirement, to establish how much Tier 1 and Tier 2 capital is available to support market risk. Eligible capital will be the sum of the whole of the bank's Tier 1 capital, plus all of its Tier 2 capital under the limits imposed in [paragraph 49(iii)] of this Framework.]

C.   Market Risk – The Standardised Approach

1.   General provisions

~~47.~~46.   The standardised approach must be calculated by all banks and reported to their supervisor monthly. All banks must calculate the capital charges according to the standardised approach at the demand of their supervisor.

2.   Structure of the standardised approach

(i)   Overview of the structure of the standardised approach

~~48.~~47.   The standardised approach capital requirement is the simple sum of three components: the enhanced delta plus risk charge, the default risk charge, and the residual risks add-on.

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[16]   References to paragraphs in the existing Basel II ~~f~~Framework contained in this section will be updated once the revised market risk framework is finalised by the Basel Committee.
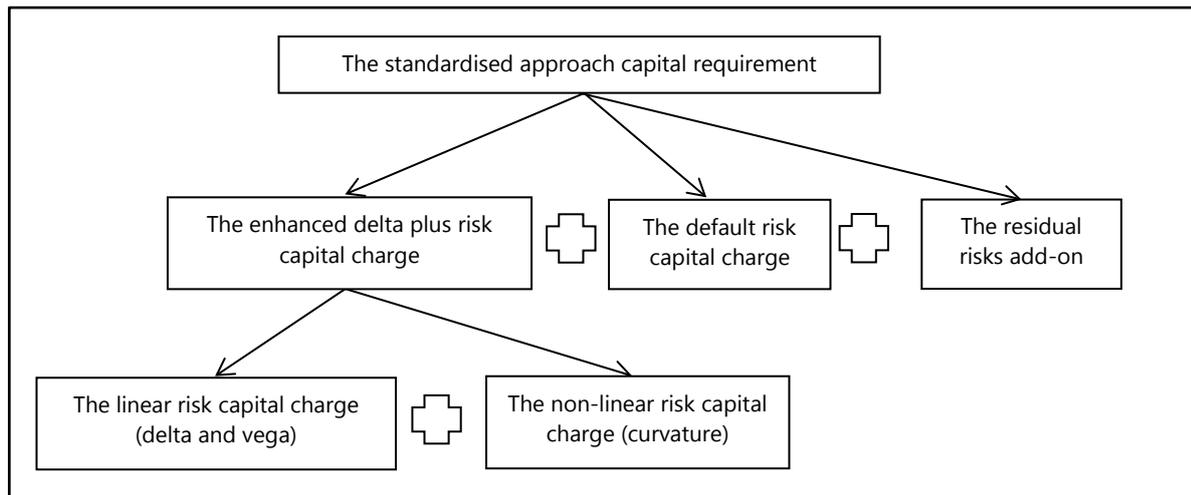
(a) The enhanced delta plus risk charge is the simple sum of (i) and (ii) below:

    (i) The linear risk capital charge (delta and vega risks), which is a risk measure based on sensitivities of a bank's trading book to regulatory risk factors. Sensitivities are the risk positions to be used as input into the aggregation formula which delivers the capital requirement for market risk.

    (ii) The non-linear risk capital charge (curvature risk) is a risk measure which captures the incremental risk not captured by the delta risk of price changes in the value of an option. The non-linear risk capital charge is based on two stress scenarios involving an upward shock and a downward shock on a given risk factor. The worst loss of the two scenarios is the risk position to be used as inputs into the aggregation formula which delivers the capital charge.

(b) In order to address the risk that correlations may increase or decrease in periods of financial stress, three figures are to be calculated for the linear risk capital charge and the non-linear risk capital charge at the risk class level, based on three different scenarios on the specified values for the correlation parameter ρ_{kl} (correlation between risk factors within a bucket) and γ_{bc} (correlation across buckets within a risk class).

(c) The bank is to determine each sensitivity and curvature scenario result based on the pricing function that its independent risk control unit uses to report market risks or profits and losses to senior management.

(d) The default risk capital charge captures the jump-to-default risk. It is calibrated based on the credit risk treatment in the banking book in order to reduce the potential discrepancy in capital requirements for similar risk exposures across the banking book and trading book of a bank. Similar to the enhanced delta plus component of the standardised approach, it allows some hedging recognition at a bucket level.

(e) The Basel Committee acknowledges that not all market risks can be captured in a standardised approach in the most risk sensitive manner, as this would necessitate an unduly complex regime. A residual risk add-on is thus introduced to ensure a sufficient coverage of market risks.

(ii) Enhanced delta plus: Main definitions

48. The following is the definition of three main concepts of the standardised approach:

- Risk class: There are seven risk classes: general interest rate risk, credit spread risk: non-securitisation, credit spread risk: securitisations, credit spread risk: securitisations (correlation trading portfolio), equity, commodity and foreign exchange.

- Risk factor: The risk factors are variables (eg a given tenor of a given interest rate curve) of a pricing formula decomposed from trading book instruments which are then mapped to a risk class.

- Risk position: a risk position is the main input that enters the risk charge computation. For delta and vega risks, it is a sensitivity to a risk factor. For curvature risk, it is the worst loss of two stress scenarios.

- Risk charge: the risk charge is the amount of capital that a bank should hold as a proportion of the risks it takes; it is computed as an aggregation of risk positions first at the bucket level, and then across buckets.

- Bucket: buckets are a set of risk positions which are grouped together by common characteristics. For instance, sensitivities to equities belonging to the same geographical region, market capitalisation size and sector.

(iii)   Enhanced delta plus: Instruments subject to delta, vega and curvature risks

49.   A key assumption of the standardised approach for market risk is that pricing models, which are used by the independent risk control function of a bank to report market risks or profits and losses to senior management, are relevant to the determination of regulatory capital requirements for all market risks. In particular, banks must establish a framework for prudent valuation practices that include the requirements of paragraph [718(c) to 718(cxii)].

(a)   Each instrument with optionality, ie each instrument that is an option or that includes an option (eg an embedded option such as convertibility or rate dependent prepayment and that is subject to the capital requirements for market risk is subject to vega risk and curvature risk. Instruments without optionality are not subject to vega risk and curvature risk. Behavioural options, ie options whose exercise depends on other retail client decisions, such as demographical features and/or and other social factors rather than pure financial gain (eg prepayment options for mortgages as they affect payments on securitisation tranches), should be subject to vega risk and curvature risk in addition to a residual risk add-on charge. Cheapest to deliver options are not viewed as options in the above sense.

(b)   Instruments whose cash flows can be written as a linear function are instruments without optionality. For instance, the cash flows generated by a bond can be written as a linear function (a rate times a notional), therefore bonds are not subject to vega risk nor curvature risk. Similarly, the cash flows generated by a plain-vanilla call option cannot be written as a linear function (as they are the maximum of the spot and the strike), therefore plain-vanilla call options are subject to vega risk and curvature risk.

(c)   A non-exhaustive list of example instruments with optionality is: calls, puts, caps, floors, swaptions, barrier options and exotic options.

(iv)   Enhanced delta plus: the linear risk (delta and vega)

50.   The linear risk charge consists of a set of prescribed risk factors and sensitivities which are defined in detail in Section 3. The **net sensitivities** to each risk factor within a risk class is multiplied by a respective risk weight provided in Section 4 and 5. These weighted sensitivities are then aggregated by prescribed formulae using correlations provided in Sections 4 and 5. This sub-section provides the aggregation formula for calculating the capital requirement within each bucket, as well as the formula for calculating the capital requirement across buckets, for each risk class that is covered under the linear risk framework.

51.   Delta and vega risks are computed using the same aggregation formulae. However, delta and vega risks must be calculated separately, with no diversification benefit recognised between delta and

vega risk factors or buckets. Delta and vega risks are captured using the same aggregation formulae through the following step-by-step approach:

(a)   Find a net sensitivity s_k across instruments to each risk factor k. For instance, all sensitivities to the tenor 1 year of the swap curve Euribor 3 months should offset, irrespective of the instrument from which they derive.[17]

(b)   Weight the net sensitivity s_k to each risk factor k by the corresponding prescribed risk weight RW_k as defined in Sections 4 and 5 to compute the weighted sensitivity WS_k.

$$WS_k = RW_k s_k$$

(c)   Weighted sensitivities should then be aggregated across risk factors within the same bucket using the corresponding prescribed correlations ρ_{kl}.

$$K_b = \sqrt{\sum_k WS_k^2 + \sum_k \sum_{k \neq l} \rho_{kl} WS_k WS_l}$$

(d)   Risk positions should then be aggregated across buckets within each risk class, using the corresponding prescribed correlations γ_{bc}.

$$\text{Linear risk} = \sqrt{\sum_b K_b^2 + \sum_b \sum_{c \neq b} \gamma_{bc} S_b S_c}$$

Where:

▪ $S_b = \sum_k WS_k$ for all risk factors in bucket b and $S_c = \sum_k WS_k$ in bucket c.

If these values for S_b and S_c produce a negative number from the computation of $\sum_b K_b^2 + \sum_b \sum_{c \neq b} \gamma_{bc} S_b S_c$:

▪   The bank is to calculate the linear risk capital charge using an alternative specification whereby $S_b = \max[\min(\sum_k WS_k, K_b), -K_b]$ for all risk factors in bucket b and $S_c = \max[\min(\sum_k WS_k, K_c), -K_c]$ for all risk factors in bucket c.

(v)   Enhanced delta plus: the non-linear risk (curvature)

52.   The non-linear risk charge consists of a set of stress scenario on given risk factors which are defined in details in Section 3. Two stress scenarios are to be computed per risk factor (an upward shock and a downward shock, the delta effect already captured by the linear risk charge being removed). The worst loss from the two scenarios is shocked by risk weights and aggregated by correlations provided in Section 6. The purpose of this subsection is to provide the aggregation formulae within buckets, and across buckets.

53.   The following step-by-step approach to capture curvature risk should be separately applied to each risk class (apart from default risk):

(a)   Find a net curvature risk charge CVR_k across instruments to each curvature risk factor k. For instance, all tenors of all the curves within a given currency (eg Euribor 3 months, Euribor 6 months, Euribor 1 year, etc for Euro) should be shifted upward. The potential loss, after deduction of the delta risk positions, is the outcome of the first scenario. The same approach should be followed on a downward scenario. The worst loss (expressed as a positive quantity), after deduction of the delta risk position, is then the curvature risk position for the considered

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[17]   This example can be generalised as follows: if a bank's portfolio is made of two interest rate swaps on Euribor 3 months with same fixed rate and same notional but of opposite direction, the general interest rate risk on that portfolio would be null.

risk factor. If the price of an option depends on several risk factors, the curvature risk is determined separately for each risk factor.

(b)   The curvature risk position can be formally written as follows -

$$CVR_k = -\min \begin{bmatrix} \sum_i \left\{ V_i\left(x_k^{(RW^{(curvature)}+)}\right) - V_i(x_k) - RW_k^{(curvature)} \cdot s_{ik} \right\} \\ \sum_i \left\{ V_i\left(x_k^{(RW^{(curvature)}-)}\right) - V_i(x_k) - RW_k^{(curvature)} \cdot s_{ik} \right\} \end{bmatrix}$$

where:

- i is an instrument subject to non-linear risks associated with risk factor k;

- x_k is the current levelof risk factor k;

- $V_i(x_k)$ is the price of instrument i depending on the current level of risk factor k;

- $V_i\left(x_k^{(RW^{(curvature)}+)}\right)$ and $V_i\left(x_k^{(RW^{(curvature)}-)}\right)$ both denote the price of instrument i after x_k is shifted (ie "shocked") upward and downward.

- under the FX, Equity and Commodity risk classes:

    ▪ $RW_k^{(curvature)}$ is the relative shift ("shock") applicable to risk factor k for instrument i (refer to paragraph 128)

    ▪ s_{ik} is the delta sensitivity of instrument i with respect to risk factor k.

- under the GIRR and CSR risk classes:

    ▪ $RW_k^{(curvature)}$ is the absolute parallel shift ("shock") applicable to all tenors of the relevant constructed risk-free curve for instrument (refer to paragraph 129)

    ▪ s_{ik} is the sum of delta sensitivities to all tenors of the relevant risk free yield curve of instrument i with respect to risk factor k.

(c)   The aggregation formula for curvature risk distinguishes between positive curvature and negative curvature risk exposures. The positive curvature risk exposures are ignored, unless they hedge a negative curvature risk exposure.iIf there is no negative curvature risk exposure from an option instrument, the curvature risk charge would be zero.

(d)   The curvature risk exposure should be aggregated within each bucket using the following formula:

$$K_b = \sqrt{\max\left(0, \sum_k \max\left(CVR_k, 0\right)^2 + \sum_k \sum_{k \neq l} \rho_{kl} CVR_k CVR_l \psi\left(CVR_k, CVR_l\right)\right)}$$

where:

- $\psi(CVR_k, CVR_l)$ is a function that takes the value 0 if CVR_k and CVR_l both have negative signs. In all other cases, $\psi(CVR_k, CVR_l)$ takes the value of 1; and

- ρ_{kl} is the corresponding prescribed correlation.

(e)   Risk positions should then be aggregated across buckets within each risk class, using the corresponding prescribed correlations γ_{bc}.

$$\text{Curvature risk } = \sqrt{\max\left(0, \sum_b K_b^2 + \sum_b \sum_{c \neq b} \gamma_{bc}\, S_b S_c\, \psi(S_b,\, S_c)\right)}$$

where:

(i) $S_b = \sum_k CVR_k$ for all risk factors in bucket b, and $S_c = \sum_k CVR_k$ in bucket c.

If these values for S_b and S_c produce a negative number from the computation of $\max\left(0, \sum_b K_b^2 + \sum_b \sum_{c \neq b} \gamma_{bc}\, S_b S_c\, \psi(S_b,\, S_c)\right)$,

the bank is to calculate the curvature risk capital charge using an alternative specification whereby $S_b = max[\min(\sum_k CVR_k, K_b), -K_b]$ for all risk factors in bucket b and $S_c = max[\min(\sum_k CVR_k, K_c), -K_c]$ for all risk factors in bucket c

(ii) $\psi(S_b, S_c)$ is a function that takes the value 0 if S_b and S_c both have negative signs. In all other cases, $\psi(S_b, S_c)$ takes the value of 1; and

(iii) γ_{bc} is the corresponding prescribed correlation.

(vi) Enhanced delta plus: managing adverse moves in correlation

54. In order to address the risk that correlations increase or decrease in periods of financial stress, three figures are to be calculated for the linear risk capital charge and the non-linear risk capital charge for each risk class, based on three different scenarios on the specified values for the correlation parameter ρ_{kl} (correlation between risk factors within a bucket) and γ_{bc} (correlation across buckets within a risk class).

(a) Under the first scenario, "high correlations", the correlation parameters ρ_{kl} and γ_{bc} that are specified in Sections 4, 5 and 6 are uniformly multiplied by **1.25**, with ρ_{kl} and γ_{bc} subject to a cap at 100%.

(b) Under the second scenario, "medium correlations", the correlation parameters ρ_{kl} and γ_{bc} remain **unchanged** from those specified in Sections 4, 5 and 6.

(c) The third scenario, "low correlations", is such that the corresponding prescribed correlations are the correlations given in Section 4, 5 and 6 which are uniformly multiplied by **0.75**.

55. The risk class level linear risk capital charge is the largest of the risk class level linear risk charges across the three correlation scenarios. The risk class level non-linear risk capital charge is the largest of the risk class level non-linear risk charges across the three correlation level scenarios. The portfolio level linear risk capital charge is then the sum of the risk class level linear risk capital charges, while the portfolio level non-linear risk capital charge is the sum of the risk class level non-linear risk capital charges.

(vii) The default risk charge

56. The default risk charge is intended to capture jump-to-default-risk. It is described in details in Section 7. The purpose of this subsection is to provide the offsetting rules as well as the hedging formula which can be applied within the default risk buckets.

57. The following step-by-step approach to capture jump-to-default risk should be followed:

(a) Compute the jump-to-default risk of each instrument separately. The jump-to-default risk is a function of notional amount (or face value) and market value of the instruments and prescribed LGD.

(b) Offsetting rules are specified in Section 7, which allows to recover "net jump-to-default" (net JTD) risk positions.

(c)   Net JTD risk positions are then allocated to buckets and weighted by prescribed risk weights. For securitisation (both correlation trading portfolio and others), the risk weights are to be computed applying the banking book regime. Within a given default risk bucket, the weighted short risk positions can be deducted from the weighted long risk positions in a proportion equal to the ratio of the long divided by the sum of the long and short non-weighted risk positions. For non-securitisation and securitisation non-correlation trading portfolio, the default risk charge is then the simple sum of bucket level default risks. For the correlation trading portfolio, in order to constrain hedging benefit recognition, the default risk charge is the simple sum of the bucket level default risks when they are positive, and half the bucket level default risks when they are negative.

(viii)   The residual risks add-on

58.   In order to ensure a sufficient level of capital against all the risks, and acknowledging the limits of the standardised approach, a residual risks add-on is to be calculated separately and in addition to other components of the capital requirement under the standardised approach for market risk.

(a)   Specifically, the scope of instruments that are subject to the residual risk add-on must not have an impact in terms of increasing or decreasing the scope of risk factors subject to the delta, vega, curvature or default risk capital treatments in the standardised approach.

(b)   The residual risks add-on is the simple sum of gross notional amounts of the instruments bearing residual risks, multiplied by [x]. For instruments which do not have a notional amount, the maximum potential loss should be used.[18]

(c)   Instruments that are within the scope of the residual risk add-on could also comprise risk exposures that are subject to the delta, vega, curvature risk as well as default risk treatments in the standardised approach. For such instruments, the residual risk add-on must be calculated in addition to any other capital requirements within the standardised approach.

(d)   The residual risk add-on will apply to any instrument that is subject to a type of risk that would otherwise not be capitalised under the proposed standardised approach. This includes in particular any instrument that meets both of the following conditions (ie any instrument meeting only one of the two conditions is not subject to the residual risks add-on):

(i)   It is subject to vega and curvature risk capital charges in the trading book.

(ii)   Its pay-offs cannot be written as a linear combination of European or American plain vanilla put and call options with a single underlying equity price, commodity price, exchange rate, bond price, CDS price or interest rate swap.

(e)   A non-exhaustive list of such types of risks and respective types of instruments that meet the conditions (d)(i) and (d)(ii) include: [19]

- *Gap risk*: risk of a significant change in delta, vega parameters in options due to small movements in the underlying, which would result in hedge slippage. Accordingly all path dependent options including barrier options, and Asian options, as well as all digital options are subject to the residual risk add-on,

- *Correlation risk*: risk of a change in a correlation parameter necessary for determination of the value of an instrument with multiple underlyings. Accordingly all

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[18]   Where the bank cannot satisfy the supervisor that the residual risk add-on provides a sufficiently prudent capital charge, the supervisor will address any potentially under-capitalised risks by imposing a conservative additional capital charge under Pillar 2.

[19]   The list hereafter is not exhaustive, a same instrument may correspond to several of the categories listed. In the QIS, a more granular list will be provided in order to gather notionals for non-overlapping categories.

basket options, best-of-options, spread options, basis options and Bermudan options are subject to the residual risk add-on. Likewise all instruments which fall under the definition of the Correlation Trading Portfolio (CTP) in Section 3, except for those instruments which are recognised in the Market Risk Framework as eligible hedges of risks within the CTP are subject to the residual risk add-on.

- *Behavioural risk*: risk of a change in exercise/prepayment outcomes as e.g. in fixed rate mortgage products due to other retail client decisions, such as demographic features and/or and other social factors, rather than pure financial gain. Accordingly, all instruments with behavioural pre-payment risk are subject to the residual risk add-on.

- *Risk from an exotic underlying*: risk of a change in value of an instrument with an underlying that is not included in any of the risk classes. (eg longevity, weather indices, emission rights e.g. for carbon dioxide, natural disasters, implied volatility, as in volatility swaps).

(f) When an instrument is subject to one or more of the following risk types, this by itself will not cause the instrument to be subject to the residual risk add-on:

(i) Risk from a cheapest-to-deliver option;

(ii) Smile risk – the risk of a change in an implied volatility parameter necessary for determination of the value of an instrument with optionality relative to the implied volatility of other instruments optionality with the same underlying and maturity, but different moneyness.

(iii) Correlation risk arising from multi-underlying European or American plain vanilla options where all underlyings have sensitivities for delta risk of the same sign, and from any options that can be written as a linear combination of such options. This exemption applies in particular to the relevant index options,

(iv) Dividend risk arising from a derivative instrument whose underlying does not consist just of dividend payments (i.e. for example equity forwards are exempted from the residual risk add-on, but dividend swaps are subject to the residual risk add-on).

3. Enhanced delta plus: definitions of the risk factors and sensitivities

(i) Risk factor definitions

59. **General Interest Rate Risk (GIRR) risk factors**

(a) *Delta GIRR:* The GIRR delta risk factors are defined along two dimensions: a risk-free yield curve for each currency in which interest rate-sensitive instruments are denominated and the following vertices: 0.25 years, 0.5 years, 1 year, 2 years, 3 years, 5 years, 10 years, 15 years, 20 years, 30 years, to which delta risk factors are assigned by linear interpolation.

(i) The risk-free yield curve per currency should be constructed using money market instruments held in the trading book which have the lowest credit risk, such as overnight index swaps (OIS). Alternatively, the risk-free yield curve should be based on one or more market-implied swap curves used by the bank to mark positions to market. For example, interbank offered rate (BOR) swap curves.

(ii) When data on market-implied swap curves described in (a)(i) is insufficient, the risk-free yield curve may be derived from the most appropriate sovereign bond curve for a given currency. The sensitivities related to sovereign bonds is not exempt from the credit spread risk capital charge. Applying swap curves to bond-derived sensitivities

for GIRR does not change the requirement for basis risk to be captured between bond and CDS curves in the CSR risk class.

    (iii)   For the purpose of constructing the risk-free yield curve per currency, an OIS curve (such as Eonia) and a BOR swap curve (such as Euribor 3M) should be considered two different curves. Two BOR curves at different maturities (eg Euribor 3M and Euribor 6M) should be considered two different curves. An onshore and an offshore currency curve (eg onshore Indian rupee and offshore Indian rupee) cannot be considered a single curve.

(b)   The GIRR delta risk factors also includes a flat curve of market-implied inflation rates for each currency.

    (i)   The sensitivity to the inflation rate from the exposure to implied coupons in an inflation instrument gives rise to a specific capital requirement.

    (ii)   This risk factor is only relevant for an instrument when a cash flow is functionally dependent on a measure of inflation (eg the notional amount or an interest payment depending on a consumer price index). GIRR risk factors other than for inflation risk will apply to such an instrument notwithstanding.

    (iii)   Inflation rate risk is considered in addition to the sensitivity to interest rates from the same instrument, which should be allocated, according to the GIRR framework, in the term structure of the relevant risk-free yield curve in the same currency.

(c)   The GIRR delta risk factors also includes two cross currency basis risk factors[20] for each currency (ie each GIRR bucket).

    (i)   The two cross currency basis risk factors are basis of each currency over USD, and basis of each currency over EUR. For instance, the two cross currency basis risk factors added to "JPY" would be "basis JPY over USD" and "basis JPY over EUR".

    (ii)   Cross currency bases that do not relate to either basis over USD or basis over EUR should be decomposed on two bases over USD. The two bases "EUR over USD" and "USD over EUR" should then be allocated to the USD bucket. GIRR risk factors other than for cross currency basis risk will apply to such an instrument notwithstanding.

    (iii)   Cross currency basis risk is considered in addition to the sensitivity to interest rates from the same instrument, which should be allocated, according to the GIRR framework, in the term structure of the relevant risk-free yield curve in the same currency.

(d)   *Vega GIRR:* The GIRR vega risk factors are the implied volatilities of options that reference GIRR-sensitive underlyings; further defined along two dimensions:

    (i)   *Maturity of the option:* The implied volatility of the option is mapped to two (or one) of the following maturity vertices: 0.5 years, 1 year, 3 years, 5 years, 10 years.

    (ii)   *Residual maturity of the underlying of the option at the expiry date of the option*: The implied volatility of the option is mapped to two (or one) of the following residual maturity vertices: 0.5 years, 1 year, 3 years, 5 years, 10 years.

(e)   *Curvature GIRR:* The GIRR curvature risk factors are defined along only one dimension: the constructed risk-free yield curve (ie no term structure decomposition) per currency: For

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[20]   Cross currency basis are basis added to a yield curve in order to evaluate a swap for which the two legs are paid in two different currencies. They are in particular used by market participants to price cross currency interest rate swaps paying a fixed or a floating leg in one currency, receiving a fixed or a floating leg in a second currency, and including an exchange of the notional in the two currencies at the begin date and at the end date of the swap.

example, the Euro, Eonia, Euribor 3M and Euribor 6M curves should be shifted at the same time in order to compute the Euro-relevant risk-free yield curve curvature risk charge. All vertices (as defined for delta GIRR) are to be shifted in parallel. There is no curvature risk capital charge for inflation and cross currency basis risks.

60. **Credit Spread Risk (CSR) non-securitisation risk factors**

(a) _Delta CSR non-securitisation:_ The CSR non-securitisation delta risk factors are defined along two dimensions: the relevant issuer credit spread curves (bond and CDS) and the following vertices: 0.5 years, 1 year, 3 years, 5 years, 10 years to which delta risk factors are assigned by linear interpolation.

(b) _Vega CSR non-securitisation:_ The vega risk factors are the implied volatilities of options that reference credit issuer names as underlyings (bond and CDS); further defined along one dimension:

   (i) _Maturity of the option:_ The implied volatility of the option is mapped to two (or one) of the following maturity vertices by linear interpolation: 0.5 years, 1 year, 3 years, 5 years, 10 years.

(c) _Curvature CSR non-securitisation:_ The CSR non-securitisation curvature risk factors are defined along one dimension: the relevant issuer credit spread curves (bond and CDS). For instance, the bond-inferred spread curve of Electricité de France and the CDS-inferred spread curve of Electricité de France would be considered a single spread curve. All vertices (as defined for CSR) are to be shifted in parallel.

61. **Definition of the Correlation Trading Portfolio**

If criteria (a) to (e) in this paragraph are met, an instrument is deemed to be part of the "correlation trading portfolio" (CTP) and the CS01 defined along two dimensions: the relevant issuer credit spread curves (bond and CDS); and the following vertices: 0.5 years, 1 year, 3 years, 5 years and 10 years) which should be computed with respect to the names underlying the securitisation or nth-to-default instrument:

(a) The instrument is not a resecuritisation position, nor derivatives of securitisation exposures that do not provide a pro rata share in the proceeds of a securitisation tranche.

(b) All reference entities are single-name products, including single-name credit derivatives, for which a liquid two-way market exists,[21] including traded indices on these reference entities.

(c) The instrument does not reference an underlying that would be treated as a retail exposure, a residential mortgage exposure, or a commercial mortgage exposure under the standardised approach to credit risk.

(d) The instrument does not reference a claim on a special purpose entity.

(e) The instrument is not a securitisation position and that hedges a position described above.

   If any of criteria (a) to (e) are not met, the instrument is deemed to be non-CTP and the CS01 should be calculated with respect to the spread of the tranche rather than the spread of the underlying of the instruments.

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[21] A two-way market is deemed to exist where there are independent bona fide offers to buy and sell so that a price reasonably related to the last sales price or current bona fide competitive bid and offer quotations can be determined within one day and the transaction settled at such price within a relatively short time frame in conformity with trade custom.

62. **CSR securitisation: non-Correlation Trading Portfolio ("non-CTP") risk factors**

(a) *Delta CSR securitisation (non-CTP):* the CSR securitisation delta risk factors are defined along two dimensions: the relevant tranche credit spread curves and the following vertices: 0.5 years, 1 year, 3 years, 5 years, 10 years to which delta risk factors are assigned by linear interpolation.

(b) *Vega CSR securitisation (non-CTP):* Prepayment rates volatility is ignored. Vega risk factors are the implied volatilities of options that reference non-CTP credit spreads as underlyings (bond and CDS), further defined along one dimension:

    (i)   *Maturity of the option:* The implied volatility of the option is mapped to two (or one) of the following maturity vertices by linear interpolation: 0.5 years, 1 year, 3 years, 5 years, 10 years.

(c) *Curvature CSR securitisation (non-CTP):* the CSR securitisation curvature risk factors are defined along one dimension: the relevant tranche credit spread curves (bond and CDS). For instance, the bond-inferred spread curve of a given Spanish RMBS tranche and the CDS-inferred spread curve of that given Spanish RMBS tranche would be considered a single spread curve. All the vertices are to be shifted in parallel.

63. **CSR securitisation: Correlation Trading Portfolio ("CTP") risk factors**

(a) *Delta CSR securitisation (CTP):* The CSR correlation trading delta risk factors are defined along two dimensions: the relevant underlying credit spread curves (bond and CDS) and the following vertices: 0.5 years, 1 year, 3 years, 5 years, 10 years to which delta risk factors are assigned by linear interpolation.

(b) *Vega CSR securitisation (CTP):* The vega risk factors are the implied volatilities of options that reference CTP credit spreads as underlyings (bond and CDS), further defined along one dimension:

    (i)   *Maturity of the option:* The implied volatility of the option is mapped to two (or one) of the following maturity vertices by linear interpolation: 0.5 years, 1 year, 3 years, 5 years, 10 years.

(c) *Curvature CSR securitisation (CTP):* The CSR correlation trading curvature risk factors are defined along one dimension: the relevant underlying credit spread curves (bond and CDS). For instance, the bond-inferred spread curve of a given name within an iTraxx series and the CDS-inferred spread curve of that given underlying would be considered a single spread curve. All the vertices are to be shifted in parallel.

64. **Equity risk factors**

(a) *Delta Equity:* The equity delta risk factors are all the equity spot prices and all the equity repurchase agreement rates (equity repo rates).

(b) *Vega Equity:* The equity vega risk factors are the implied volatilities of options that reference the equity spot prices as underlyings, further defined along one dimension:

    (i)   *Maturity of the option:* The implied volatility of the option is mapped to two (or one) of the following maturity vertices by linear interpolation: 0.5 years, 1 year, 3 years, 5 years, 10 years.

(c) *Curvature Equity:* The equity curvature risk factors are all the equity spot prices. There is no curvature risk capital charge for equity repo rates.

65. **Commodity risk factors**

(a) _Delta Commodity:_ The commodity delta risk factors are all the commodity spot prices depending on contract grade [22] of the physical commodity, delivery location (city) of the physical commodity and time to maturity of the traded instrument.

(b) _Vega Commodity:_ The commodity vega risk factors are the implied volatilities of options that reference commodity spot prices as underlyings. No differentiation between commodity spot prices by maturity of the underlying, grade or delivery location is required. The commodity vega risk factors are further defined along one dimension:

   (i) _Maturity of the option:_ The implied volatility of the option is mapped to two (or one) of the following maturity vertices by linear interpolation: 0.5 years, 1 year, 3 years, 5 years, 10 years.

(c) _Curvature Commodity:_ The commodity curvature risk factors are all the commodity spot prices.

66. **Foreign exchange (FX) risk factors**

(a) _Delta FX:_ All the exchange rates between the currency in which an instrument is denominated and the reporting currency.

(b) _Vega FX:_ For the purpose of vega risk, the foreign exchange risk factors are the implied volatilities of options that reference exchange rates between currency pairs; further defined along one dimension:

   (i) _Maturity of the option:_ The implied volatility of the option is mapped to two (or one) of the following maturity vertices by linear interpolation: 0.5 years, 1 year, 3 years, 5 years, 10 years.

(c) _Curvature FX:_ All the exchange rates between the currency in which an instrument is denominated and the reporting currency.

(ii) Definition of the sensitivities

67. Sensitivities for each risk class are expressed in the reporting currency of the bank.

67(a) **Delta GIRR:** Sensitivity is defined as the PV01 (sensitivity) of an instrument i with respect to vertex t of the risk-free yield curve for the currency in which i is denominated. PV01 is determined by calculating the change in the market value of the instrument (V_i (.)) as a result of a 1 basis point shift in the interest rate r at vertex t (r_t) of the risk-free yield curve in a given currency, divided by 0.0001 (ie 0.01%). In notation form:

$$s_{k,r_t} = \frac{V_i(r_t + 0.0001, cs_t) - V_i(r_t, cs_t)}{0.0001}$$

where:

- r_t is the risk-free yield curve ("market interest rate" and not "zero coupon rate") at tenor t;

- cs_t is the credit spread curve at tenor t;

- V_i (.) is the market value of an instrument i as a function of the risk-free interest rate curve and credit spread curve.

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[22] "Grade" refers to the contract grade of the commodity, sometimes known as the "basis grade" or "par grade". This is the minimum accepted standard that a commodity must meet to be accepted as the actual physical deliverable against the contract.

Instructions: Impact study on the proposed frameworks for market risk and CVA risk

67(b) **Delta CSR non-securitisation:** Sensitivity is defined as CS01. The CS01 (sensitivity) of an instrument i is determined by calculating the change in the market value of the instrument (V_i (.)) as a result of a 1 basis point change to credit spread cs at vertex t (cs_t), divided by 0.0001 (ie 0.01%). In notation form:

$$s_{k,cs_t} = \frac{V_i(r_t, cs_t + 0.0001) - V_i(r_t, cs_t)}{0.0001}$$

67(c) **Delta CSR securitisation and nth-to-default:** Sensitivity is defined as the CS01, with no change to the sensitivity specification in the previous paragraph.

67(d) **Delta Equity spot:** The sensitivity is calculated by taking the value of a 1 percentage point change in equity spot price, divided by 0.01 (ie 1%). In notation form:

$$s_k = \frac{V_i(1.01\ EQ_k) - V_i(EQ_k)}{0.01}$$

where:

- k is a given equity;

- EQ_k is the market value of equity k; and

- V_i (.) is the market value of instrument i as a function of the price of equity k.

67(e) **Delta Equity repos:** The sensitivity is calculated by taking the value of a 1 basis point absolute translation of the equity repo rate term structure, divided by 0.0001 (ie 0.01%). In notation form:

$$s_k = \frac{V_i(RTS_k + 1bp) - V_i(RTS_k)}{0.0001}$$

where:

- k is a given equity;

- RTS_k is the repo term structure of equity k; and

- V_i (.) is the market value of instrument i as a function of the repo term structure of equity k.

67(f) **Delta Commodity:** The sensitivity is calculated by taking the value of a 1 percentage point change in commodity spot price, divided by 0.01 (ie 1%):

$$s_k = \frac{V_i(1.01\ CTY_k) - V_i(CTY_k)}{0.01}$$

where:

- k is a given commodity;

- CTY_k is the market value of commodity k; and

- V_i (.) is the market value of instrument i as a function of the spot price of commodity k.

67(g) **Delta FX:** The sensitivity is calculated by taking the value of a 1 percentage point change in exchange rate, divided by 0.01 (ie 1%):

$$s_k = \frac{V_i(1.01\ FX_k) - V_i(FX_k)}{0.01}$$

where:

- k is a given currency;

- FX_k is the exchange rate between currency k and the reporting currency; and
- V_i (.) is the market value of instrument i as a function of the exchange rate k.

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68.   **Vega risk sensitivities:**

(a)   The vega risk sensitivity $\frac{\partial V}{\partial \sigma_i} \cdot \sigma_i$ of option j (ie the product of the vega of the option and its implied volatility) to the relevant maturity node(s) n_j. The portfolio-level vega risk sensitivity to all the vega risk factors within a risk class ("vs_{kn_j}") related to all the options j is defined as follows:

$$vs_{kn_j} = \sum_i \left(\frac{\partial V_j}{\partial \sigma_j} \cdot \sigma_j \right)_{kn_j}$$

(b)   The following provides detailed specification for how vega risk sensitivities for non-exotic options that are well- approximated in the standardised approach are to be derived:

(i)   The vega risk sensitivity is the product of the vega and the implied volatility of option j at maturity n_j, which has to be mapped to specific vertices as described in Section 3(i). More often the option's maturity does not perfectly coincide with a specified vertex point so both the vega and the implied volatility of option j have to be decomposed.

- As a first step to this decomposition, the bank maps the implied volatility (σ_j) of option j to the respective maturity vertices T_1 and T_2 for the relevant risk class by linear interpolation, in order to determine the relative contribution of implied volatility.[23]

- As a second step to this decomposition, the bank takes the vega ($\frac{\partial V_j}{\partial \sigma_j}$) for option j and allocates it to the respective maturity vertices T_1 and T_2 in the same proportion as done for the implied volatility (σ_j).

(ii)   The product of the decomposed vega and implied volatility at vertex T_1 yields the vega risk sensitivity contribution of option j to that vertex. Similarly, the product of the decomposed vega and implied volatility at vertex T_2 yields the vega risk sensitivity contribution of option j to that vertex.

(iii)   This procedure is repeated for all options that reference underlyings associated with delta risk factor k.

(iv)   For GIRR and CSR, an option might not coincide with a maturity vertex n nor an underlying maturity vertex m. In this context, bilinear interpolation should be employed to derive four vega risk sensitivity contributions from option j.[24] This is likewise repeated for all options that reference underlyings associated with delta risk factor k.

(v)   The portfolio-level vega risk sensitivity to all the vega risk factors within a risk class ("vs_{kn_j}") related to all the options j are then aggregated as set out in paragraph 69(a).

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[23]   For instance the weighting from option j with maturity n_j which falls between the two maturity vertices T_1 and T_2 should be as follows: the weight assigned to maturity vertex T_1 is equal to $\left(\frac{T_2 - n_j}{T_2 - T_1}\right)$ and the weight assigned to vertex T_2 is equal to $\left(1 - \left(\frac{T_2 - n_j}{T_2 - T_1}\right)\right)$.

[24]   If the option j with maturity n_j and underlying maturity of m_j which lies between vertices T_3 and T_4, the weighting for vertex (T_1, T_3) is $\frac{(T_2 - n_j)}{T_2 - T_1} \cdot \frac{(T_4 - m_j)}{T_4 - T_3}$, vertex (T_2, T_3) is $\frac{(n_j - T_1)}{T_2 - T_1} \cdot \frac{(T_4 - m_j)}{T_4 - T_3}$, vertex (T_1, T_4) is $\frac{(T_2 - n_j)}{T_2 - T_1} \cdot \frac{(m_j - T_3)}{T_4 - T_3}$ and vertex (T_3, T_4) is $\frac{(n_j - T_2)}{T_2 - T_1} \cdot \frac{(m_j - T_3)}{T_4 - T_3}$.

(iii)   Treatment of indices and multi-underlying options

69.   In the delta risk context:

(a)   Indices/index funds must be decomposed into their constituent instruments. Net sensitivities to each delta risk factor derived from the constituent instruments are to be calculated as per the specifications in Section 3(ii). A "weight" is then determined by dividing each delta sensitivity by the simple sum of all the delta sensitivities to the constituents. In notational form, this "delta weighted ratio" can be expressed as follows:

$$w_{ck} = s_{ck} / \sum_k s_{ck}$$

where w_{ck} is the delta-weighted ratio and s_{ck} is the sensitivity of index constituent instrument c to delta risk factor k.

(b)   The delta-weighted sensitivity is then determined by multiplying w_{ck} by s_{ck}. This delta-weighted sensitivity is then to be inputted into the enhanced delta plus approach.

(c)   As per the requirement on the boundary between the trading book and the banking book in paragraph 21, the indices which cannot be looked-through must be assigned to the banking book.

70.   In the vega risk context:

(a)   Index options and similar multi-underlying options are usually priced based on the implied volatility of the index option (rather than the implied volatility of its constituents). The vega risk sensitivity is to be calculated by multiplying the delta-weighted ratio w_{ck} by the vega $\frac{\partial V_j}{\partial \sigma_j}$ and the implied volatility σ_j of index option j :

$$vs_k = w_{ik} \cdot \frac{\partial V_j}{\partial \sigma_j} \cdot \sigma_j$$

71.   In the curvature risk context, it is also permitted to directly compute the curvature risk charge before any decomposition for index options and multi-underlying options. This index curvature risk charge must then be decomposed based on the same delta weighted sensitivities ratio w_{ik} as defined in paragraph 69.

(iv)   Requirements on sensitivities computations

72.   When computing a first-order sensitivity for instruments subject to optionality, banks should assume that the implied volatility remains constant, consistent with a "sticky delta" approach. This concept is illustrated in the following graph:

σ: implied volatility of the option

t: reporting date

S: underlying price
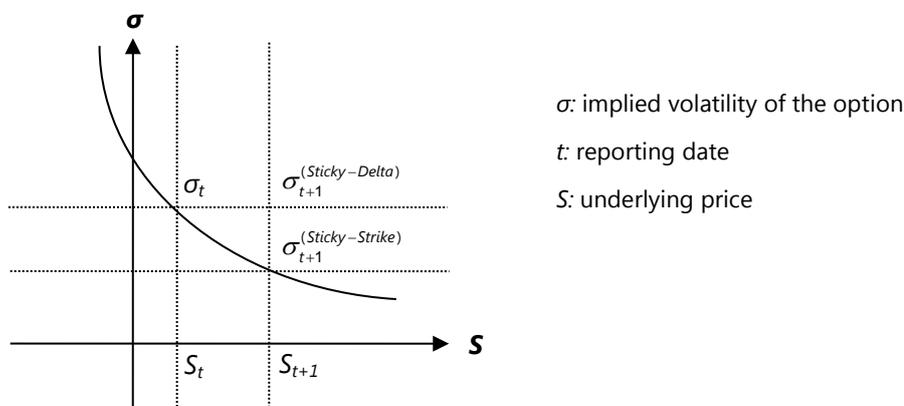
(a)   When computing a vega GIRR or CSR sensitivity, banks may use either the lognormal or normal assumptions. When computing a vega Equity, Commodity or FX sensitivity, banks must use the lognormal assumption.[25]

(b)   If, for internal risk management, a bank computes sensitivities using definitions differing from the definitions provided in the present standards, this bank may use linear transformations to deduce from the sensitivities it computes the one to be used for the linear risk measure, knowing that the difference between these transformations and the exact price movements shall be captured through the non-linear risk measure.

(c)   All sensitivities must be computed ignoring the impact of Credit Valuation Adjustments (CVA).

4.   Enhanced delta plus: Prescribed delta risk weights and correlations

73.   The prescribed risk weights and correlations in this section have been calibrated to the liquidity adjusted time horizon related to each risk class.

(i)   Delta GIRR

Buckets

74.   Each bucket represents an individual currency exposure to GIRR.

Risk weights

75.   The risk weights are set as follows:

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[25]   Since the vega ($\frac{\partial V}{\partial \sigma_i}$) on an instrument is multiplied by its implied volatility (σ_i), the vega risk sensitivity for that instrument will be the same under the lognormal assumption and the normal assumption. As a consequence, banks may use a lognormal or normal assumption for GIRR and CSR (in recognition of the trade-offs between constrained specification and computational burden for a standardised approach). For the other risk classes, banks must only use a lognormal assumption (in recognition that this is aligned with common practices across jurisdictions).

Tenor	0.25 year	0.5 year	1 year	2 year	3 year
Risk weight (percentage points)	1.6%	1.6%	1.5%	1.25%	1.15%

Tenor	5 year	10 year	15 year	20 year	30 year
Risk weight (percentage points)	1.0%	1.0%	1.0%	1.0%	1.0%

(a)   A risk weight of 1.5% is set for the inflation risk factor and the cross currency basis risk factor, respectively.

(b)   For selected currencies by the Basel Committee,[26] the above risk weights are to be divided by the square root of 2.

Correlations

76.   The delta risk correlation ρ_{kl} is set at 99.90% between sensitivities WS_k and WS_l within the same bucket (ie same currency), same assigned vertex, but different curve.

77.   The delta risk correlation ρ_{kl} between sensitivities WS_k and WS_l within the same bucket (ie same currency) with different tenor and same curve is set at $max\left[e^{\left(-\theta\cdot\frac{|T_k-T_l|}{min\{T_k;T_l\}}\right)};40\%\right]$,[27] where:

(a) T_k (respectively T_l) is the vertex that relates to WS_k (respectively WS_l)

(b) θ set at 3%.

78.   [[Between two sensitivities WS_k and WS_l within the same bucket (ie same currency), different tenor and different curves, the correlation ρ_{kl} is equal to the correlation parameter specified in paragraph 77 multiplied by 0.999.[28] [29]]

79.   The delta risk correlation ρ_{kl} between a sensitivity WS_k to the inflation curve and a sensitivity WS_l to a given tenor of the relevant yield curve should be 40%.

80.   The delta risk correlation ρ_{kl} between a sensitivity WS_k to the cross currency basis curve and a sensitivity WS_l to either a given tenor of the relevant yield curve or the inflation curve should be 0%.

81.   The parameter γ_{bc} = 50% should be used for aggregating across different currencies.

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[26]   Selected currencies by the Basel Committee are: EUR, USD, GBP, AUD, JPY, SEK, CAD as well as the domestic reporting currency of a bank.

[27]   For example, the correlation between a sensitivity to the tenor 1 year of the Eonia swap curve and the a sensitivity to the tenor 5 year of the Eonia swap curve in the same currency is $max\left[e^{\left(-3\%\cdot\frac{|1-5|}{min\{1;5\}}\right)};40\%\right]=88.69\%$.

[28]   For example, the correlation between a sensitivity to the tenor 1 year of the Eonia swap curve and a sensitivity to the tenor 5 year of the Euribor 3M swap curve in the same currency is $(88.69\%)\cdot(0.999)=88.60\%$.

[29]   This additional step in the correlation derivation process will be subject to further calibration after the quantitative impact assessment is conducted and as the proposed standardised approach for market risk is reviewed by the Committee.

(ii)   Delta CSR non-securitisations

Buckets

82.   Sensitivities or risk exposures should first be assigned to a bucket according to the following table:

Bucket number	Credit quality	Sector
1	Investment grade (IG)	Sovereigns including central banks, multilateral development banks
2		Financials including government-backed financials
3		Basic materials, energy, industrials, agriculture, manufacturing, mining and quarrying
4		Consumer goods and services, transportation and storage, administrative and support service activities
5		Technology, telecommunications
6		Health care, utilities, local government, government-backed non-financials, education, public administration, professional and technical activities
7	High yield (HY) & non-rated (NR)	Sovereigns including central banks, multilateral development banks
8		Financials including government-backed financials
9		Basic materials, energy, industrials, agriculture, manufacturing, mining and quarrying
10		Consumer goods and services, transportation and storage, administrative and support service activities
11		Technology, telecommunications
12		Health care, utilities, local government, government-backed non-financials, education, public administration, and professional and technical activities
13	Other sector[30]	

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[30]   Credit quality is not a differentiating consideration for this bucket.

Risk weights

83. The risk weights for the buckets 1 to 13 are set out in the following table.[31] Risk weights are the same for all tenors (ie 0.5 yr, 1 yr, 3 yr, 5 yr, 10 yr) within each bucket:

Bucket number	Risk weight (percentage points)
1	2.5%
2	5.0%
3	3.5%
4	3.0%
5	2.5%
6	2.0%
7	10.0%
8	12.0%
9	9.0%
10	10.0%
11	9.0%
12	6.0%
13	12.0%

Correlations

84. The delta risk correlation ρ_{kl} is set at 99.90% between two sensitivities WS_k and WS_l within the same bucket related to the same issuer name, different curves, same tenor (eg a sensitivity to the Apple bond curve and a sensitivity to the Apple CDS curve).

85. The delta risk correlation ρ_{kl} is set at 65.00% between two sensitivities WS_k and WS_l within the same bucket related to the same issuer name, same curve, different tenor.

(a) *[Between two sensitivities WS_k and WS_l within the same bucket related to same issuer name, different curve and different tenor, the correlation is equal to 65.00% multiplied by 0.999.]*

86. The delta risk correlation ρ_{kl} is set at 35.00% between two sensitivities WS_k and WS_l within the same bucket related to different issuer name and same curve.

(a) *[Between two sensitivities WS_k and WS_l within the same bucket related to different issuer name and different curve, the correlation ρ_{kl} is equal to 35.00% multiplied by 0.999.]*

87. The correlation parameter γ_{bc} is to be applied to the aggregation of sensitivities across different buckets, as defined in the following table:

Bucket	1	2	3	4	5	6	7	8	9	10	11	12	13
1		10%	20%	25%	20%	15%	50%	5%	10%	12.5%	10%	7.5%	0%
2			5%	15%	20%	5%	5%	50%	2.5%	7.5%	10%	2.5%	0%
3				20%	25%	5%	10%	2.5%	50%	10%	12.5%	2.5%	0%
4					25%	5%	12.5%	7.5%	10%	50%	12.5%	2.5%	0%
5						5%	10%	10%	7.5%	7.5%	50%	2.5%	0%
6							7.5%	2.5%	2.5%	2.5%	2.5%	50%	0%

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[31] The risk weights in this table will be subject to further calibration after the quantitative impact assessment is conducted and as both the proposed standardised approach for market risk and proposed standardised approach for CVA are reviewed by the Committee.

Bucket						
7	5%	10%	12.5%	10%	7.5%	0%
8		2.5%	7.5%	10%	2.5%	0%
9			10%	12.5%	2.5%	0%
10				12.5%	2.5%	0%
11					2.5%	0%
12						0%
13						

(iii)   Delta CSR Securitisations (correlation trading portfolio)

Buckets

88.   Sensitivities to CSR arising from the correlation trading portfolio and its hedges are treated as a separate asset class, for which the same bucket structure and correlation structure apply as those for the CSR non-securitisation framework, but for which the risk weights and correlations of the Delta CSR non-securitisations are modified to reflect longer liquidity horizons and larger basis risk.

Risk weights

89.   Risk weights are the same for all tenors (ie 0.5 yr, 1 yr, 3 yr, 5 yr, 10 yr) within each bucket:

Bucket number	Risk weight (in percentage points)
1	5.0%
2	8.0%
3	5.5%
4	5.0%
5	3.5%
6	3.0%
7	16.0%
8	17.0%
9	12.0%
10	15.0%
11	12.0%
12	9.0%
13	17.0%

Correlations

90.   The delta risk correlation ρ_{kl} is set at 99.00% between two sensitivities within a bucket related to same issuer name and same tenor, but different curves (for instance, a sensitivity to Apple as a constituent of an index and a sensitivity to the Apple CDS curve).

91.   Otherwise, the correlation parameters for ρ_{kl} and γ_{bc} are identical to CSR non-securitisation.

(iv)   Delta CSR Securitisations (non-correlation trading portfolio)

Buckets

92.   Sensitivities or risk exposures should first be assigned to a bucket according to the following table:

Bucket number	Credit quality	Sector
1	Senior Investment grade (IG)	RMBS – Prime
2		RMBS – Mid-Prime
3		RMBS – Sub-Prime
4		CMBS
5		ABS – Student loans
6		ABS – Credit cards
7		ABS – Auto
8		CLO non-correlation trading portfolio
9	Non-Senior Investment grade (IG)	RMBS – Prime
10		RMBS – Mid-Prime
11		RMBS – Sub-Prime
12		CMBS
13		ABS – Student loans
14		ABS – Credit cards
15		ABS – Auto
16		CLO non-correlation trading portfolio
17	High yield (HY) & non-rated (NR)	RMBS – Prime
18		RMBS – Mid-Prime
19		RMBS – Sub-Prime
20		CMBS
21		ABS – Student loans
22		ABS – Credit cards
23		ABS – Auto
24		CLO non-correlation trading portfolio
25	Other sector[32]	

Risk weights

93.   The risk weights for the buckets 1 to 8 (Senior Investment Grade) are set out in the following table:

Bucket number	Risk weight (in percentage points)
1	4.0%
2	6.5%
3	8.5%
4	8.5%
5	3.5%
6	5.0%
7	5.0%

[32]   Credit quality is not a differentiating consideration for this bucket.

8	6.0%

94.   The risk weights for the buckets 9 to 16 (Non-Senior Investment grade) are then equal to the corresponding risk weights for the buckets 1 to 8 scaled up by a multiplication by 2. For instance, the risk weight for the bucket 9 is equal to $2 \times 4.0\% = 8.0\%$.

95.   The risk weights for the buckets 17 to 24 (High yield & non-rated) are then equal to the corresponding risk weights for the buckets 1 to 8 scaled up by a multiplication by 4 For instance, the risk weight for the bucket 17 is equal to $4 \times 4.0\% = 16.0\%$.

96.   The risk weight for bucket 25 is set at 34.0%

Correlations

97.   The delta risk correlation ρ_{kl} is set at 99.90% between two sensitivities WS_k and WS_l within the same bucket related to same issuer name and the same tenor, but different curves (eg a sensitivity to a given tranche bond curve and a sensitivity to that given tranche curve).

98.   The delta risk correlation ρ_{kl} is set at 80.00% between two sensitivities WS_k and WS_l within the same bucket related to the same issuer name (more than 80% overlap in notional terms), different tenor, same curve.

(a)   *[Between two sensitivities WS_k and WS_l within the same bucket related to same issuer name (more than 80% overlap in notional terms), different tenor and different curve, the correlation ρ_{kl} is 80.00% multiplied by 0.999.]*

99.   The delta risk correlation ρ_{kl} is set at 40.00% between two sensitivities WS_k and WS_l within the same bucket and related to different issuer name (less than 80% overlap in notional terms) and same curve.

(a)   *[Between two sensitivities WS_k and WS_l within the same bucket related to different issuer name (less than 80% overlap in notional terms) and different curve, the correlation parameter ρ_{kl} is 40.00% multiplied by 0.999.]*

100.   The correlation parameter γ_{bc} applies to the aggregation of sensitivities across different buckets. It is set as 0%.

(v)   Equity risk

Buckets

101.   Sensitivities should first be assigned to a bucket as defined in the following table:

Bucket number	Market cap	Economy	Sector
1	Large	Emerging market economy	Consumer goods and services, transportation and storage, administrative and support service activities, healthcare, utilities
2			Telecommunications, industrials
3			Basic materials, energy, agriculture, manufacturing, mining and quarrying
4			Financials including government-backed financials, real estate activities, technology
5		Advanced economy	Consumer goods and services, transportation and storage, administrative and support service activities, healthcare, utilities
6			Telecommunications, industrials

7			Basic materials, energy, agriculture, manufacturing, mining and quarrying
8			Financials including government-backed financials, real estate activities, technology
9	Small	Emerging market economy	All sectors described under bucket numbers 1, 2, 3 and 4
10		Advanced economy	All sectors described under bucket numbers 5, 6, 7 and 8
11	Other sector[33]		

102.   Market capitalisation ("market cap") is defined as the sum of the market capitalisations of the same legal entity or group of legal entities across all stock markets globally.

103.   "Large market cap" is defined as a market capitalisation equal to or greater than USD 2 billion and "small market cap" is defined as a market capitalisation of less than USD 2 billion.

104.   The advanced economies are Canada, the United States, Mexico, the euro area, the non-euro area western European countries (the United Kingdom, Norway, Sweden, Denmark and Switzerland), Japan, Oceania (Australia and New Zealand), Singapore and Hong Kong SAR.

105.   The sector definition is the one generally used in the market. When allocating an equity position to a particular bucket, the bank must prove to its national supervisory authority that the equity issuer's most material activity corresponds to the bucket's definition.

106.   For multinational multi-sector equity issuers, the allocation to a particular bucket must be done according to the most material region and sector the issuer operates in.

Risk weights

107.   The risk weights for the sensitivities to Equity spot price and Equity repo rate for buckets 1 to 11 are set out in the following table:

Bucket number	Risk weight for Equity spot price (percentage points)	Risk weight for Equity repo rate (percentage points)
1	55%	0.55%
2	60%	0.60%
3	45%	0.45%
4	55%	0.55%
5	30%	0.30%
6	35%	0.35%
7	40%	0.40%
8	50%	0.50%
9	70%	0.70%
10	50%	0.50%
11	70%	0.70%

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[33]   Market capitalisation or economy (ie advanced or emerging market) is not a differentiating consideration for this bucket.

Correlations

108.   The delta risk correlation parameter ρ_{kl} is set at 90% between two sensitivities WS_k and WS_l within the same bucket where one is a sensitivity to an Equity spot price and the other a sensitivity to an Equity repo rate, where both are related to the same Equity issuer name.

109.   Otherwise, the correlation parameter ρ_{kl} between two sensitivities WS_k and WS_l to Equity spot price within the same bucket are defined in (a) to (d) below:

(a)   15% between two sensitivities within the same bucket that fall under large market cap, emerging market economy (bucket number 1, 2, 3 or 4).

(b)   25% between two sensitivities within the same bucket that fall under large market cap, advanced economy (bucket number 5, 6, 7, or 8).

(c)   7.5% between two sensitivities within the same bucket that fall under small market cap, emerging market economy (bucket number 9).

(d)   12.5% between two sensitivities within the same bucket that fall under small market cap, advanced economy (bucket number 10).

110.   The correlation parameter ρ_{kl} between two sensitivities WS_k and WS_l to Equity repo rate within the same bucket is also defined according to paragraph 109(a) to 109(d).

111.   *[Between two sensitivities WS_k and WS_l within the same bucket where one is a sensitivity to an Equity spot price and the other a sensitivity to an Equity repo rate and both sensitivities relate to a different Equity issuer name, the correlation parameter ρ_{kl} is set at the correlations specified in paragraphs 109(a) to 109(d) multiplied by 0.999.]*

112.   The correlation parameter γ_{bc} applies to the aggregation of sensitivities across different buckets. γ_{bc} is set as follows:

(a)   15% if bucket *b* and bucket *c* fall within bucket numbers 1 to 10.

(b)   0% if either bucket *b* or bucket *c* is bucket number 11.

(vi)   Commodity risk

Buckets

113.   Eleven buckets are defined, one for each of the 11 commodity types defined in the next paragraph.

Risk weights

114. The risk weights depend on the commodity bucket (which group several commodities, eg the precious metals bucket includes silver and gold) as set out in the following table:

Bucket	Commodity category	Risk weight (percentage points)
1	Coal	30%
2	Crude oil	35%
3	Electricity	60%
4	Freight	80%
5	Metals	40%
6	Natural gas	45%
7	Precious metals (including gold)	20%
8	Grains & oilseed	35%
9	Livestock & dairy	25%
10	Softs and other agriculturals	35%
11	Other commodity	50%

Correlations

115. The correlation parameter ρ_{kl} between two sensitivities WS_k and WS_l within the same commodity bucket is set out in the table below. These correlations apply regardless of differences in the any of the following factors: (i) contract grade of a physical commodity,[34] (ii) delivery location of a physical commodity or (iii) time to maturity of the traded instrument.

116. *[Between two sensitivities WS_k and WS_l within the same commodity bucket that differ by one, two or all of the three factors (i) to (iii) described in paragraph 115, the correlation ρ_{kl} is set at the parameters specified for each bucket in the table multiplied by 0.999.]*

Bucket	Commodity category	Correlation (ρ_{kl})
1	Coal	55%
2	Crude oil	95%
3	Electricity	40%
4	Freight	80%
5	Metals	60%
6	Natural gas	65%
7	Precious metals (including gold)	55%
8	Grains & oilseed	45%
9	Livestock & dairy	15%
10	Softs & other agriculturals	40%
11	Other commodity group	15%

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[34] "Contract grade" refers to the purity or quality of a commodity to be delivered against a contract.

117. The correlation parameters γ_{bc} applying to sensitivity or risk exposure pairs across different buckets is set at:

(a) 20% if bucket b and bucket c fall within bucket numbers 1 to 10.

(b) 0% if either bucket b or bucket c is bucket number 11.

118. For the "Electricity" bucket, each time interval at which the electricity can be delivered and that is subject to a contract that is made on a financial market is considered a distinct electricity commodity (just as silver and gold are considered distinct precious metals). Electricity produced in various areas such as Electricity NE, Electricity SE, Electricity North should also be considered distinct electricity commodities and therefore the correlation parameters in the preceding paragraphs should apply between sensitivities to each of those electricity types. In addition, the electricity risk factor can either be the spot or the forward price, as transactions on the forward price are more frequent than transactions on spot price.

(vii) Foreign exchange risk

Risk weights

119. A unique relative risk weight equal to 15% applies to all the FX sensitivities or risk exposures.

(a) For the specified currency pairs by the Basel Committee[35], the above risk weight is to be divided by the square root of 2.

Correlations

120. A uniform correlation parameter γ_{bc} equal to 60% applies across FX sensitivity or risk exposure pairs.

5. Enhanced delta plus: Prescribed vega risk weights and correlations

(i) The vega buckets

121. The delta buckets are replicated in the vega context. For instance, all the sensitivities to the volatility of equities spot having the characteristics large, emerging market economies, telecommunications or industrials are treated within the second vega risk equity bucket.

122. As for delta risk, the bucket remains the first level of aggregation across risk positions (ie the same steps in paragraph 51 are to be performed).

(ii) The vega risk weights

123. The risk of market illiquidity is incorporated into the determination of vega risk factors, through the assignment of different liquidity horizons for each risk class. The risk weight for a given vega risk factor k (RW_k) is determined by the following function:

$$RW_k = \min\left[RW_\sigma \cdot \frac{\sqrt{LH_{risk\ class}}}{\sqrt{10}}; 100\%\right]$$

where:

- RW_σ is set at 0.0032 for GIRR and CSR, and 0.55 in all other cases;

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[35] Selected currency pairs by the Basel Committee are: USD/EUR, USD/JPY, USD/GBP, USD/AUD, USD/CAD, USD/CHF, USD/MXN, USD/CNY, USD/NZD, USD/RUB, USD/HKD, USD/SGD, USD/TRY, USD/KRW, USD/SEK, USD/ZAR, USD/INR, USD/NOK, USD/BRL, EUR/JPY, EUR/GBP, EUR/CHF and JPY/AUD.

- $LH_{risk\ class}$ is the regulatory liquidity horizon to be prescribed in the determination of each vega risk factor k. $LH_{risk\ class}$ is specified as follows:

Risk class	$LH_{risk\ class}$
GIRR	60
CSR non-securitisations	250
CSR securitisations (CTP)	250
CSR securitisations (non-CTP)	250
Equity (large market cap)	20
Equity (small market cap)	120
Commodity	120
FX	60

(iii)   Correlations between different vega risk factors within the same bucket

124.   Between vega risk sensitivities within the same bucket of the GIRR risk class, the correlation parameter ρ_{kl} is set as follows:

$$\rho_{kl} = min\left[\rho_{kl}^{(DELTA)} \cdot \rho_{kl}^{(option\ maturity)} \cdot \rho_{kl}^{(underlying\ maturity)}; 1\right]$$

where:

- $\rho_{kl}^{(DELTA)}$ is equal to the correlation that applies between the two delta risk factors. For instance, if k is the vega to equity option X and l is the vega to equity option Y, $\rho_{kl}^{(DELTA)}$ would be equal to the correlation between sensitivities to the equity spot X and the equity spot Y.

- $\rho_{kl}^{(option\ maturity)}$ is equal to $e^{-\alpha \cdot \frac{|T_k - T_j|}{min\{T_k; T_l\}}}$ where α is set at 1%, T_k (respectively T_j) is the maturity of the option from which the vesensitivity VR_k (VR_j) is derived, expressed as a number of years;

- $\rho_{kl}^{(underlying\ maturity)}$ is equal to $e^{-\alpha \cdot \frac{|T_k^U - T_j^U|}{min\{T_k^U; T_j^U\}}}$, where α is set at 1%, T_k^U (respectively T_j^U) is the maturity of the underlying of option from which the sensitivity VR_k (VR_j) is derived, expressed as a number of years after the maturity of the option.

125.   Between vega risk sensitivities within a bucket of the other risk classes (ie not GIRR), the correlation parameter ρ_{kl} is set as follows:

$$\rho_{kl} = min\left[\rho_{kl}^{(DELTA)} \cdot \rho_{kl}^{(option\ maturity)}; 1\right]$$

where the definitions for $\rho_{kl}^{(DELTA)}$ and $\rho_{kl}^{(option\ maturity)}$ are set out in paragraph 124.

126.   Between vega risk sensitivities across buckets within a risk class (GIRR and non-GIRR), the same correlation parameters for γ_{bc}, as specified for delta correlations for each risk class in Section 4, are to be used in the vega risk context (eg γ_{bc} = 50% is to be used for aggregation of vega risk sensitivities across different GIRR buckets).

127.   There is no diversification or hedging benefit recognised in the standardised approach between vega and delta risk factors. Vega and delta risk capital charges are aggregated by simple summation.

6. Enhanced delta plus: Prescribed curvature risk weights and correlations

(i) The curvature buckets

128. The delta buckets are replicated in the curvature context. For instance, all the curvature risk positions of equities spot having the characteristics large, emerging market economies, telecommunications or industrials are treated within the second curvature risk equity bucket.

129. As for delta risk, the bucket remains the first level of aggregation across risk positions.

(ii) The curvature risk weights

130. The curvature risk weights are equal to the delta risk weights.

131. For GIRR, the parallel shift of the curve should be based on the highest risk weight across all the tenors. This risk weight of 160 basis points is applied to all the tenors at once, for each risk-free yield curve (consistent with a so-called "translation", or "parallel shift" risk calculation).

(iii) The curvature correlations

132. Between curvature exposures, each delta correlation parameters ρ_{kl} and γ_{bc} should be squared. For instance, between CVR_{EUR} and CVR_{USD} in the GIRR context, the correlation should be $50\%^2 = 25\%$.

7. The default risk charge

133. The capital requirement for default risk is the sum of the requirements for default risk of non-securitisations, default risk of securitisations (non-correlation trading portfolio) and default risk of securitisations correlation trading portfolio. The methodology for calculating these requirements is set out in the following sections.

134. For the correlation trading portfolio (CTP), default risk for securitisation includes non-securitisation hedges. These hedges are to be removed from the default risk non-securitisation calculations.

135. In line with criteria set out in other parts of the Capital Accord, at national discretion claims on sovereigns, public sector entities and multilateral development banks may be subject to a zero default risk weight. National authorities may apply a non-zero risk weight to securities issued by certain foreign governments, including to securities denominated in a currency other than that of the issuing government.

(i) Default risk charge for non-securitisations

Gross Jump-to-default risk positions (gross JTD)

136. As a first step, the gross JTD risk is computed, position by position. For instance, if a bank is long a bond on Apple, and short another bond on Apple, it must compute two JTD positions.

137. The determination of the long/short direction of positions should be on the basis of long or short with respect to the underlying credit exposure. Specifically, a long position is a position for which the default of the underlying obligor results in a loss. In the case of derivative contracts, the long/short direction is determined by whether the contract has long or short exposure to the underlying credit exposure as defined in the previous sentence (ie not bought/sold option, and not bought/sold CDS). Thus, a sold put option on a bond is a long credit exposure, since a default would result in a loss to the seller of the option.

138.   For the capitalisation of JTD risk, the representation of positions uses notional amounts and market values. This approach is different from the use of credit spread sensitivities in the capitalisation of credit spread risk. The default risk capital charge is intended to capture stress events in the tail of the default distribution which are not captured by credit spread shocks in mark-to-market risk. The use of credit spread sensitivities would underestimate the loss from jump-to-default, because credit spreads are a measure of the expected loss from default, which by definition is less severe that the default loss in the tail of the default distribution, and it is the default severity in the tail of the default distribution that is covered by the default risk capital charge. Similarly, for credit options, using the delta equivalent to represent positions for default risk would underestimate the loss at default, because the definition of an option's delta employs an expected value calculation with respect to the entire default distribution which by its nature is an underestimate of the risk of default loss in the tail of the default distribution.

139.   The gross JTD is a function of the LGD, notional amount (or face value) and the cumulative P&L already realised on the position:

$$\text{JTD (long)} = \max [\text{LGD} \times \text{notional} + \text{P\&L}, 0]$$

$$\text{JTD (short)} = \min [\text{LGD} \times \text{notional} + \text{P\&L}, 0]$$

where *notional* is the bond-equivalent notional (or face value) of the position and P&L is the cumulative mark-to-market loss (or gain) already taken on the exposure. In more detail,

$$\text{P\&L} = \text{market Value} - \text{notional},$$

where market value is the current market value of the position.

140.   In the equations, the notional of a long (short) position is recorded as a positive (negative) value, while the P&L loss (gain) is recorded as a negative (positive) value.

141.   Equity instruments and non-senior debt instruments are assigned an LGD of 100%. Senior debt instruments are assigned an LGD of 75%. Covered bonds are assigned an LGD of 25%.

142.   The starting point is the notional amount and mark-to-market loss already realized on a credit position. The notional amount is used to determine the loss of principal at default, and the mark-to-market loss is used to determine the net loss so as to not double-count the mark-to-market loss already recorded in the market value of the position. For all instruments, the notional amount is the notional amount of the instrument relative to which the loss of principal is determined. For instance, the notional amount of a bond would be the face value, while for credit derivatives the notional amount of a CDS contract or a put option on a bond would be the notional amount of the derivative contract. In the case of a call option on a bond, however, the notional amount to be used in the JTD equation would be zero (since, in the event of default, the call option would not be exercised). In this case, a jump-to-default would extinguish the call option's value and this loss would be captured through the mark-to-market P&L term in the JTD equation. The table below provides an illustration of the use of notional amounts and market values in the JTD equation:

Examples of components for a long credit position in the JTD equation

Instrument	Notional	Bond-equivalent market value	P&L
Bond	Face value of bond	Market value of bond	Market value – face value
CDS	Notional of CDS	Notional of CDS – | MtM value of CDS|	–| MtM value of CDS |
Sold put option on a bond	Notional of option	Strike amount – MtM value of option	(Strike – MtM value of option) – Notional
Bought call option on a bond	0	MtM value of option	MtM value of option

The bond-equivalent market value is an intermediate step in determining the P&L for derivative instruments.

Loss=bond equivalent market value-notional.

JTD = max [LGD × notional + P&L, 0], in the case of a long position (see definition above for the case of a short position).

In the expressions above, the MtM values of CDS and options are absolute values.

Strike amount of bond option in terms of bond price (not the yield).

With this representation of the P&L for a sold put option, a lower strike results in a lower JTD loss.

The examples above are for long credit positions with a MtM loss.

143.   To account for defaults within the one year capital horizon, the JTD for all exposures of maturity less than one year are scaled by a fraction of a year. No scaling is applied to the JTD for exposures of one year or greater.[36] For example, the JTD for a position with a six month maturity would be weighted by one-half, while the JTD for a position with a one year maturity would have no scaling applied to the JTD. Equity positions (i.e. stock) are assigned maturities of greater than one year. The maturity weighting applied to the JTD for short term lending is floored at a weighting factor of one-fourth or, equivalently, 3 months.

Net Jump-to-default risk positions (net JTD)

144.   The JTD amounts of long and short positions to the same obligor may be offset where the short position has the same or lower seniority relative to the long position. For example, a short position in an equity may offset a long position in a bond, but a short position in a bond cannot offset a long position in the equity.

145.   Exposures of different maturities that meet this offsetting criterion may be offset as follows. Exposures with maturities longer than the capital horizon (one year) may be fully offset, but in the case of longer-than-one-year vs less-than-one-year exposures the offset benefit of the less than one year exposure must be reduced as follows. An exposure to an obligor comprising a mix of long and short positions with a maturity less than the capital horizon (equal to one year) should be weighted by the ratio of the position's maturity relative to the capital horizon.

For example, with the one-year capital horizon, a three-month short position would be weighted so that its benefit against long positions of longer-than-one-year maturity would be reduced to one quarter of the position size.[37]

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[36]   Note that this paragraph refers to the scaling of gross JTD (ie not net JTD).

[37]   Since the capital horizon is one-year, default risk is assessed only for default events within that one-year horizon. Default events within the one-year horizon will have the same effect on both long and short exposures that are longer than one year regardless of their maturity difference. For exposures under one year, however, defaults within the year might affect one

In the case of long and short offsetting positions where both have a maturity under one year, the scaling can be applied to both the long and short positions. Finally, the offsetting may result in net long JTD amounts and net short JTD amounts. The net long and net short JTD amounts are aggregated separately as described below.

Equity positions (i.e. stock) are assigned maturities of greater than one year. For derivative exposures, the maturity of the derivative contract is considered in determining the offsetting criterion, not the maturity of the underlying position.

Default risk charge for non-securitisations

146.   Default risk weights are assigned to net JTD by credit quality categories (ie rating bands), irrespective of the type of counterparty, as in the following table for illustration only. The actual default risk weights will be determined by the approach of the TFSA for consistency with the capital treatment in the banking book.

Credit quality category	Default risk weight
AAA	0.5%
AA	2%
A	3%
BBB	6%
BB	15%
B	30%
CCC	50%
Unrated	15%
Defaulted	100%

147.   The weighted net JTD are then allocated to buckets. The three buckets for this purpose are corporates, sovereigns, and local governments/municipalities.

148.   In order to recognise hedging relationship between long and short positions within a bucket, a hedge benefit ratio is computed.

(a)   A simple sum of the net (not weighted) long JTD amounts must be calculated, where the summation is across the credit quality categories (ie rating bands). The aggregated amount is used in the numerator and denominator of the expression of the *WtS* below.

(b)   A simple sum of the net (not weighted) short JTD amounts must be calculated, where the summation is across the credit quality categories (ie rating bands). The aggregated amount is used in the denominator of the expression of the *WtS* below.

(c)   The hedge benefit weighting term *WtS* is the ratio of long to gross long and short JTD amounts:

$$WtS = \frac{\sum net\ JTD_{long}}{\sum net\ JTD_{long} + \sum |net\ JTD_{short}|}$$

exposure but not another depending on the timing of the default. For example, a default at 4 months will effect a 6 month position, but not a 3 month position. Thus, exposures shorter than one-year should be weighted by their maturity (as a fraction of a year)..

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149.   The overall capital charge for each bucket should then be calculated as the combination of the sum of the risk-weighted long net JTD, where the summation is across the credit quality categories (ie rating bands), the WtS, and the sum of the risk-weighted short net JTD, where the summation is across the credit quality categories (ie rating bands):

$$DRC_b = max\left[\left(\sum_{i \in Long} RW_i \cdot net\ JTD_i\right) - WtS \cdot \left(\sum_{i \in Short} RW_i \cdot |net\ JTD_i|\right); 0\right]$$

Where DRC stands for "default risk charge", and i refers to an instrument belonging to bucket b.

150.   No hedging is recognised across different buckets. Therefore, the total capital charge for default risk non-securitisations must be calculated as a simple sum of the bucket-level capital charges. For example, no hedging or diversification is recognised across corporate and sovereign debt, and the total capital charge is the sum of the corporate capital charge and the sovereign capital charge.

(ii)   Default risk charge for securitisations (non-correlation trading portfolio)

Gross Jump-to-default risk positions (gross JTD)

151.   For the computation of gross JTD on securitisations, the same approach should be followed as for default risk (non-securitisations), except that an LGD ratio is not applied to the exposure. Because the LGD is already included in the default risk weights for securitisations to be applied to the exposure (see below), to avoid double counting of LGD the JTD for securitisations is simply the market value of the exposure.

152.   For the purposes of offsetting and hedging in this section, positions in underlying names or a non-tranched index position may be decomposed proportionately into the equivalent replicating tranches that span the entire tranche structure. When underlying names are used in this way, they must be removed from the non-securitisation default risk treatment.

Net Jump-to-default risk positions (net JTD)

153.   For default risk (securitisations), offsetting is limited to a specific tranche and underlying asset pool. This means that:

(a)   no offsetting is permitted across securitisations of different asset pools, even if the tranche is the same; and

(b)   no offsetting is permitted across tranches of the same asset pool.

154.   Exposures that are otherwise identical except for maturity may be offset, subject to the same restriction as for positions of less than one year described above for non-securitisations. Exposures that are perfect replications through decomposition may be offset. Specifically, if a collection of long positions can be replicated by a collection of short positions, then the positions may be offset. For securitisations of mixed-category pools, the security may be allocated into the relevant categories in proportions determined by the proportionate composition of the underlying mixed pool. After the decomposition, the offsetting rules would apply as in any other case. As in the case of default risk (non-securitisations), long and short exposures should be determined from the perspective of long or short the underlying credit.

Default risk charge for securitisations (non-CTP)

155.   The default risk capital charge for securitisations is determined in the same approach as for default risk (non-securitisations), except that exposures are sorted by tranche instead of credit quality. The default risk weights for securitisations applied to the tranches are based on the risk weights in the

corresponding treatment for the banking book, which has been released in a separate Basel Committee publication.[38] To avoid double-counting of risks in the maturity adjustment (of the banking book approach) since migration risk in the trading book will be captured in the credit spread charge, the maturity component in the banking book securitisation framework is set to one year. Following the corresponding treatment in the banking book, the hierarchy of approaches in determining the risk weights should be applied at the underlying pool level.

156. For default risk (securitisations), the buckets are defined as follows:

(a) Corporates constitute a unique bucket, taking into account all the regions.

(b) The other buckets are defined along the two dimensions asset class and region. The 11 asset classes are ABCP, Auto Loans/Leases, RMBS, Credit Cards, CMBS, Collateralised Loan Obligations, CDO-squard, Small and Medium Enterprises, Student loans, Other retail, Other wholesal. The 4 regions are Asia, Europe, North America, and All other.

157. Within buckets, the capital charge for default risk (securitisations) is determined in a similar approach to that for non-securitisations. The hedge benefit discount (*WtS* as defined in paragraph 148) is applied to net short positions in that bucket, and the capital charge is calculated as in paragraph 149.

158. No hedging is recognised across different buckets. Therefore, the total capital charge for default risk securitisations must be calculated as a simple sum of the bucket-level capital charges.

(iii)   Default risk charge for securitisations (correlation trading portfolio)

Gross Jump-to-default risk positions (gross JTD)

159. For the computation of gross JTD on securitisations, the same approach should be followed as for default risk-securitisations (non-CTP) as described in paragraph 151.

160. Nth-to-default products should be treated as tranched products with attachment and detachment points defined as:

(a) attachment point = (N − 1) / Total Names

(b) detachment point = N / Total Names

where "Total Names" is the total number of names in the underlying basket or pool.

Net Jump-to-default risk positions (net JTD)

161. Exposures that are otherwise identical except for maturity may be offset but with the same restriction for positions of less than one year as described in the section on default risk (non-securitisations). Specifically, exposures longer than the capital horizon (one year) may be fully offset, but in the case of longer-than-one-year vs less-than-one-year exposures, the offset benefit of the less-than-one-year exposure must be reduced as described above.

(a) For index products, for the exact same index family (eg CDX NA IG), series (eg series 18) and tranche (eg 0–3%), positions should be offset (netted) across maturities (subject to the offsetting allowance as described above).

(b) Long/short exposures that are perfect replications through decomposition may be offset as follows. For long/short positions in index tranches, and indices (non-tranched), if the exposures are to the exact same series of the index, then offsetting is allowed by replication and decomposition. For instance, a long position in a 10–15% tranche vs combined short positions

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[38]   Basel Committee on Banking Supervision, *Revisions to the securitisation framework*, December 2014, www.bis.org/bcbs/publ/d303.htm.

in 10–12% and 12–15% tranches on the same index/series can be offset against each other. Similarly, long positions in the various tranches that, when combined perfectly, replicate a position in the index series (non-tranched) can be offset against a short position in the index series if all the positions are to the exact same index and series (eg CDX NA IG series 18). Long/short positions in indices and single-name constituents in the index may also be offset by decomposition. For instance, single-name long positions that perfectly replicate an index may be offset against a short position in the index. When a perfect replication is not possible, then offsetting is not allowed. Where the long/short positions are otherwise equivalent except for a residual component, the net amount must show the residual exposure. For instance, a long position in an index of 125 names, and short positions of the appropriate replicating amounts in 124 of the names, would result in a net long position in the missing 125th name of the index.

(c)   Different tranches of the same index or series may not be offset (netted), different series of the same index may not be offset, and different index families may not be offset.

Default risk charge for securitisations (CTP)

162.   The default risk weights for securitisations applied to tranches are based on the risk weights in the corresponding treatment for the banking book, which has been released in a separate Basel Committee publication.[39] To avoid double-counting of risks in the maturity adjustment (of the banking book approach) since migration risk in the trading book will be captured in the credit spread charge, the maturity component in the banking book securitisation framework is set to one year.

163.   For default risk (CTP), each index is regarded as a bucket of its own. A non-exhaustive list of indices is: CDX North America IG, iTraxx Europe IG, CDX HY, iTraxx XO, LCDX (loan index), iTraxx LevX (loan index), Asia Corp, Latin America Corp, Other Regions Corp, Major Sovereign (G7 and Western Europe), Other Sovereign.

164.   Within buckets, the capital charge for default risk (CTP) is determined in a similar approach to that for non-securitisations. The hedge benefit discount (*WtS* as defined in paragraph 148) is applied to net short positions in that bucket as in the equation below. In this case, however, the hedge ratio (WtS) is determined using the combined long and short positions across all indices in the CTP (i.e. not only the long and short positions of the bucket by itself). A deviation from the approach used for non-securitisation is that no floor at 0 is made at bucket level, and as a consequence, the default risk charge at index level (DRC_b) can be negative:

$$DRC_b = \left(\sum_{i \in Long} RW_i \cdot net\ JTD_i \right) - \text{WtS}_{ctp} \cdot \left(\sum_{i \in Short} RW_i \cdot net\ JTD_i \right)$$

The summation of risk weighted amounts in the equation spans all exposures relating to the index (i.e. index tranche, bespoke, non-tranche index, or single name). The subscript ctp for the term WtS$_{ctp}$ indicates that the hedge benefit ratio is calculated using the combined long and short positions across the entire CTP book and not just the positions in the particular bucket.

165.   The bucket-level capital amounts are then aggregated as follows:

$$DRC_{CTP} = \max[\sum_b (\max[DRC_b, 0] + 0.5 \times \min[DRC_b, 0]), 0]$$

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[39]   Basel Committee on Banking Supervision, *Revisions to the securitisation framework*, December 2014, www.bis.org/bcbs/publ/d303.htm.

For instance, if the default risk charge for the index CDX North America IG is +100 and the default risk charge for the index Major Sovereign (G7 and Western Europe) is -100, the total default risk charge for the correlation trading portfolio is $100 - 0.5 \times 100 = 50$.[40]

D. Market risk – The Internal Models Approach

1. General criteria

166. The use of an internal model for the purposes of regulatory capital determination will be conditional upon the explicit approval of the bank's supervisory authority. Home and host country supervisory authorities of banks that carry out material trading activities in multiple jurisdictions intend to work cooperatively to ensure an efficient approval process.

167. The supervisory authority will only give its approval if at a minimum:

- It is satisfied that the bank's risk management system is conceptually sound and is implemented with integrity;

- The bank has, in the supervisory authority's view, sufficient numbers of staff skilled in the use of sophisticated models not only in the trading area but also in the risk control, audit and, if necessary, back office areas;

- The bank's models have, in the supervisory authority's judgement, a proven track record of reasonable accuracy in measuring risk;

- The bank regularly conducts stress tests along the lines discussed in paragraphs 1895 to 19202 below; and

- The positions included in the internal model for regulatory capital determination are held in approved trading desks that have passed the required tests described in paragraph 1782 below.

168. Supervisory authorities will be able to insist on a period of initial monitoring and live testing of a bank's internal model before it is used for supervisory capital purposes.

169. In addition to these general criteria, banks using internal models for capital purposes will be subject to the additional requirements detailed below.

2. Qualitative standards

170. Supervisory authorities must be able to assure themselves that banks using internal models have market risk management systems that are conceptually sound and implemented with integrity. Accordingly, the bank must meet the following *qualitative criteria* on an ongoing basis. Supervisors must assess that banks have met the criteria before they are permitted to use a models-based approach. These qualitative criteria include:

(a) The bank must have an independent risk control unit that is responsible for the design and implementation of the bank's risk management system. The unit should produce and analyse daily reports on the output of the bank's risk measurement model, including an evaluation of the relationship between measures of risk exposure and trading limits. This unit must be

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[40] The procedure for the *DRCb* and *DRCctp* terms accounts for the basis risk in cross index hedges, as the hedge benefit from cross-index short positions is discounted twice, first by the hedge benefit ratio *WtS* in *DRCb*, and again by the term 0.5 in the *DRCctp* equation.

independent from business trading units and should report directly to senior management of the bank.

(b) The unit must conduct regular backtesting and profit and loss (P&L) attribution programmes, ie an ex-post comparison of the risk measure and P&L values generated by the model against actual daily changes in portfolio values over longer periods of time, as well as hypothetical changes based on static positions. Both of these exercises should be conducted at a trading desk level, while regular backtesting should also be conducted on the firm-wide internal model for regulatory capital determination level.

(c) A distinct unit must conduct the initial and ongoing validation of all internal models. Internal models must be validated on at least an annual basis.

(d) Board of directors and senior management must be actively involved in the risk control process and need to regard risk control as an essential aspect of the business to which significant resources are devoted. In this regard, the daily reports prepared by the independent risk control unit must be reviewed by a level of management with sufficient seniority and authority to enforce both reductions of positions taken by individual traders and reductions in the bank's overall risk exposure.

(e) Internal models used to calculate market risk capital charges are likely to differ from those used by banks in their day-to-day internal management functions. Nevertheless, the starting point for the design of both the regulatory and the internal risk models should be the same. In particular, the valuation models that are embedded in both should be similar. These valuation models should be an integral part of the internal identification, measurement, management and internal reporting of price risks within the firm. As well, internal risk models should, at a minimum, cover the positions covered by the regulatory models, although they may cover more. In the construction of their regulatory capital models, banks should start from the methodologies used in their internal models with regard to risk factor identification, parameter estimation and proxy concept and deviate only if this is appropriate due to regulatory constraints. It is expected that the same risk factors are covered in the regulatory models as in the internal models.

(f) A routine and rigorous programme of stress testing is required as a supplement to the risk analysis based on the output of the bank's risk measurement model. The results of stress testing must be reviewed at least monthly by senior management, used in the internal assessment of capital adequacy, and reflected in the policies and limits set by management and the board of directors. Where stress tests reveal particular vulnerability to a given set of circumstances, prompt steps must be taken to mitigate those risks appropriately (eg by hedging against that outcome or reducing the size of the bank's exposures, or increasing capital).

(g) Banks need to have a routine in place for ensuring compliance with a documented set of internal policies, controls and procedures concerning the operation of the risk measurement system. The bank's risk measurement system must be well documented, for example, through a comprehensive risk management manual that describes the basic principles of the risk management system and that provides a detailed explanation of the empirical techniques used to measure market risk.

(h) Any significant changes to an approved model must be approved by the supervisor prior to being implemented.

(i) Risk measures must be calculated on the full set of positions which are in the scope of application of the model. The risk measures must be based on a sound theoretical basis, calculated correctly, and reported accurately.

(j)   An independent review of the risk measurement system should be carried out regularly by either the bank's own internal auditing process or an external auditor. This review should include both the activities of the business trading units and of the independent risk control unit. The review must be sufficiently detailed to determine for any failings which desks are impacted. A review of the overall risk management process should take place at regular intervals (not less than once a year) and should specifically address, at a minimum:

- The organisation of the risk control unit;

- The adequacy of the documentation of the risk management system and process;

- The accuracy and appropriateness of the risk measurement system (including any significant changes);

- The verification of the consistency, timeliness and reliability of data sources used to run internal models, including the independence of such data sources;

- The approval process for risk pricing models and valuation systems used by front and back-office personnel;

- The scope of market risks captured by the risk measurement model;

- The integrity of the management information system;

- The accuracy and completeness of position data;

- The accuracy and appropriateness of volatility and correlation assumptions;

- The accuracy of valuation and risk transformation calculations; and

- The verification of the model's accuracy through frequent backtesting and P&L attribution as described in Appendix B: *Supervisory framework for the use of backtesting in conjunction with the internal models approach to market risk capital requirements*.

3.   Quantitative standards

171.   Banks will have flexibility in devising the precise nature of their models, but the following minimum standards will apply for the purpose of calculating their capital charge. Individual banks or their supervisory authorities will have discretion to apply stricter standards.

(a)   "*Expected shortfall*" must be computed on a daily basis for the bank-wide internal model for regulatory capital purposes. Expected shortfall must also be computed on a daily basis for each trading desk that a bank wishes to include within the scope for the internal model for regulatory capital purposes.

(b)   In calculating the expected shortfall, a 97.5th percentile, one-tailed confidence interval level is to be used.

(c)   In calculating the expected shortfall, the liquidity horizons described in point (k) should be reflected by scaling an expected shortfall calculated on a base horizon. For the scaling of expected shortfall to the liquidity horizon of the relevant risk factors, expected shortfall should be calculated at a base liquidity horizon of 10 days with full revaluation (for full-revaluation ES, approaches that capture curvature risk such as grid-based methods would be appropriate), and the scaling to the liquidity horizon of a risk factor should be applied to this base horizon result as follows:

$$ES = \sqrt{\left(ES_T\left(P\right)\right)^2 + \sum_{j \geq 2}\left(ES_T\left(P, j\right)\sqrt{\frac{\left(LH_j - LH_{j-1}\right)}{T}}\right)^2}$$

where:

- *ES* is the regulatory liquidity-adjusted expected shortfall;

- *T* is the length of the base horizon, ie 10 days;

- $ES_T(P)$ is the expected shortfall at horizon *T* of a portfolio with positions *P* = *(p_i)* with respect to shocks to all risk factors that the positions *P* are exposed to;

- $ES_T(P, j)$ is the expected shortfall at horizon *T* of a portfolio with positions *P* = *(p_i)* with respect to shocks for each position p_i in the subset of risk factors $Q(p_i, j)$, with all other risk factors held constant;

- the ES at horizon *T*, $ES_T(P)$ and $ES_T(P, j)$ must be calculated for changes in risk factors over the time interval *T* with full revaluation (ie without approximation; specifically, neither $ES_T(P)$ nor $ES_T(P, j)$ should be scaled from a shorter horizon). For full-revaluation ES, approaches that capture curvature risk such as grid-based methods would be appropriate;

- $Q(p_i, j)$ is the subset of risk factors whose liquidity horizons, as specified in point (k), for the desk where p_i is booked are at least as long as LH_j according to the table below. For example, $Q(p_i, 4)$ is the set of risk factors with a 120-day horizon and a 250-day liquidity horizon. Note that, $Q(p_i, j)$ is a subset of $Q(p_i, j-1)$;

- the time series of changes in risk factors over the base time interval *T* may be determined by overlapping intervals; and

- LH_j is the liquidity horizon *j*, with lengths in the following table:

j	LH_j
1	10
2	20
3	60
4	120
5	250

- In calculating the expected shortfall, instantaneous shocks equivalent to an *n*-business day movement in risk factors are to be used. *n* is defined based on the liquidity characteristics of the risk factor being modelled, as described in point (k) below. These shocks must be calculated based on a sample of *n*-business day horizon overlapping observations over the relevant sample period (see point (d)).[41]

(c)(d)   The expected shortfall measure must be calibrated to a period of stress. Specifically, the measure should replicate an expected shortfall charge that would be generated on the bank's

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[41]   For historical simulation, this implies that two years of historical data are needed, because of a 12-month observation period and liquidity horizons up to one year. To calculate the different overlapping periods, a common starting point (t−x) must be defined. Starting from this data point, the P&L changes have to be estimated using the different liquidity horizons. Assume one instrument with a 10-day liquidity horizon and one with a 250-day liquidity horizon. Within the historical simulation, P&L_{t-x; t-x+10} is added to P&L_{t-x; t-x+250}; P&L_{t-x+1; t-x+11} is added to P&L_{t-x+2; t-x+252} and so on. Finally, the ES is estimated based on these aggregated scenarios. This implies that, for the 10-day liquidity horizon, the most recent data point used is 240 days before the data point used for the 250-day liquidity horizon.

current portfolio if the relevant risk factors were experiencing a period of stress. This is a joint assessment across all relevant risk factors, which will capture stressed correlation measures. This calibration is to be based on an "indirect" approach using a reduced set of risk factors. Banks are to specify a reduced set of risk factors that are relevant for their portfolio and for which there is a sufficiently long history of observations. This reduced set of risk factors is subject to supervisory approval and must meet the data quality requirements for a modellable risk factor as outlined in paragraph 1783(c) and have a minimum observation history of [10] years. The identified reduced set of risk factors must be able to explain a minimum of [75%] of the variation in of the full ES model (ie the ES of the reduced set of risk factors should be at least equal to 75% of the fully specified ES model on average measured over the preceding 12 week period).

The expected shortfall for the portfolio using this set of risk factors, calibrated to the most severe 12-month period of stress available over the observation horizon, is calculated. That value is then scaled up by the ratio of the current expected shortfall using the full set of risk factors to the current expected shortfall measure using the reduced set of factors. The expected shortfall for risk capital purposes is therefore:

$$ES = ES_{R,S} \cdot \frac{ES_{F,C}}{ES_{R,C}}$$

where the expected shortfall for capital purposes (ES) is equal to the expected shortfall based on a stressed observation period using a reduced set of risk factors ($ES_{R,S}$) multiplied by the ratio of the expected shortfall measure based on the current (most recent) 12-month observation period with a full set of risk factors ($ES_{F,C}$) and the expected shortfall measure based on the current period with a reduced set of risk factors ($ES_{R,C}$). For the purpose of this calculation, the ratio is floored at 1.

(d)(e)   For measures based on current observations ($ES_{F,C}$), banks must update their *data sets* no less frequently than once every month and should also reassess them whenever market prices are subject to material changes. This updating process must be flexible enough to allow for more frequent updates. The supervisory authority may also require a bank to calculate its Expected Shortfall using a shorter observation period if, in the supervisor's judgement; this is justified by a significant upsurge in price volatility. In this case, however, the period should be no shorter than [6] months.

(e)(f)   For measures based on stressed observations ($ES_{R,S}$), banks must identify the 12-month period of stress over the observation horizon in which the portfolio experiences the largest loss. The observation horizon for determining the most stressful 12 months must, at a minimum, span back to 2005. Observations within this period must be equally weighted. Banks must update their 12-month stressed periods no less than monthly, or whenever there are material changes in the risk factors in the portfolio.

(f)(g)   No particular type of expected shortfall model is prescribed. So long as each model used captures all the material risks run by the bank, as confirmed through P&L attribution and backtesting, and conforms to each of the requirements set out above and below, supervisors may permit banks to use models based on either historical simulation,or Monte Carlo simulation,s or other appropriate analytical methods.

(g)(h)   Banks will have discretion to recognise empirical *correlations* within broad regulatory risk factor classes (interest rate risk, equity risk, foreign exchange risk, commodity risk and credit risk, including related options volatilities in each risk factor category). Empirical correlations across broad risk factor categories will be constrained by the supervisory aggregation scheme (see paragraph 1789), and must be calculated and used in a manner consistent with the applicable liquidity horizons, clearly documented and able to be explained to supervisors on request.

(h)(i)   Banks' models must accurately capture the unique risks associated with *options* within each of the broad risk categories. The following criteria apply to the measurement of options risk:

- Banks' models must capture the *non-linear price characteristics* of options positions;

- Each bank's risk measurement system must have a set of risk factors that captures the *volatilities of the rates and prices* underlying option positions, ie vega risk. Banks with relatively large and/or complex options portfolios must have detailed specifications of the relevant volatilities. This means that banks should model the volatility surface across both strike price and tenor.

(i)(j)   Each bank must meet, on a daily basis, a *capital requirement* expressed as the sum of the higher of (1) its previous day's aggregate capital charge for market risk according to the parameters specified in paragraphs 177 to 184this section (ACC_{t-1}); and (2) an average of the daily capital measures in the preceding 60 business days (ACC_{avg}).

Therefore, the capital requirement *c* is calculated according to the following formula:

$$c = \max \left\{ ACC_{t-1}; \, m_c(ACC_{avg}) \right\}$$

$$c = \max \left\{ ACC_{t-1}; ACC_{avg} \right\}$$

(j)(k)   As set out in point (c), a scaled expected shortfall should be calculated based on the liquidity horizon *n* defined below. n instantaneous shock equivalent to an *n*-business day movement in risk factors is to be used. *n* is calculated using the following conditions:

- bBanks must map each risk factor on to one of the risk factor categories shown in (c) below using consistent and clearly documented procedures;

- tThe mapping must be (i) set out in writing; (ii) validated by the Bank's risk management; (iii) made available to supervisors; and (iv) subject to internal audit; and

- *n* is determined for each broad category of risk factor as set out in the following table. However, on a desk-by-desk basis *n* can be increased relative to the values in the table below (ie the liquidity horizon specified below can be treated as a floor). Where *n* is increased, the increased horizon must be 20, 60, 120 or 250 days and the rationale must be documented and be subject to supervisory approval:

Risk factor category	n	Risk factor category	n
Interest rate – domestic currency of a bank: EUR, USD, GBP, AUD, JPY, SEK, and CAD	10~~20~~	Equity price (small cap) volatility	120
Interest rate ~~ATM volatility~~ other currencies	20~~60~~	Equity (other)	120
Interest rate ATM volatility~~Interest rate (other)~~	60	FX rate – liquid currency pairs[42]	20~~10~~
Interest rate (other than yields and ATM volatility)	60	FX rate (other currency pairs)	20
Credit spread – sovereign (IG)	20	FX volatility	60
Credit spread – sovereign (HY)	60	FX (other)	60
Credit spread – corporate (IG)	60	Energy price	20
Credit spread – corporate (HY)	120	Precious metal price	20
Credit spread – structured (cash and CDS)	250	Other commodities price	60
Credit (other)	250	Energy price volatility	60
Equity price (large cap)	10	Precious metal price volatility	60
Equity price (small cap)	20	Other commodities price volatility	120
Equity price (large cap) volatility	20	Commodity (other)	120

4. Model validation standards

172.   Banks must have processes in place to ensure that their internal models have been adequately validated by suitably qualified parties independent of the development process to ensure that they are conceptually sound and adequately capture all material risks. This validation must be conducted when the model is initially developed and when any significant changes are made to the model. Models must be periodically revalidated, particularly when there have been significant structural changes in the market or changes to the composition of the portfolio which might lead to the model no longer being adequate. Model validation should not be limited to P&L attribution and backtesting, but should, at a minimum, also include the following:

(a)   Tests to demonstrate that any assumptions made within the internal model are appropriate and do not underestimate risk. This may include the assumption of the normal distribution and any pricing models.

(b)   Further to the regulatory backtesting programmes, testing for model validation must use hypothetical changes in portfolio value that would occur were end-of-day positions to remain unchanged. It therefore excludes fees, commissions, bid-ask spreads, ~~net interest income~~ and intraday trading. Moreover, additional tests are required which may include, for instance:

- Testing carried out for longer periods than required for the regular backtesting programme (eg three years);

- Testing carried out using confidence ~~intervals~~ levels other than the 97.5% and 99% ~~interval~~ level required under the quantitative standards;

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[42]   USD/EUR, USD/JPY, USD/GBP, USD/AUD, USD/CAD, USD/CHF, USD/MXN, USD/CNY, USD/NZD, USD/RUB, USD/HKD, USD/SGD, USD/TRY, USD/KRW, USD/SEK, USD/ZAR, USD/INR, USD/NOK, USD/BRL, EUR/JPY, EUR/GBP, EUR/CHF and JPY/AUD.

- Testing carried out using liquidity horizons other than those applicable to the risk factors or not using overlapping periods;

- Testing of portfolios should be done at both the trading desk and bank-wide level; and

- Testing of the necessary inputs for a~~n~~ ~~IDR~~ DRC VaR measure at the 99.9% ~~interval~~level.

(c)   The use of hypothetical portfolios to ensure that the model is able to account for particular structural features that may arise, for example:

Where data histories for a particular instrument do not meet the quantitative standards in paragraph 17~~8~~1 and where the bank has to map these positions to proxies, then the bank must ensure that the proxies produce conservative results under relevant market scenarios;

- Ensuring that material basis risks are adequately captured. This may include mismatches between long and short positions by maturity or by issuer;

- Ensuring that the model captures concentration risk that may arise in an undiversified portfolio.

5.   Determining the eligibility of trading activities

173.   The process for determining the eligibility of trading activities for the internal models-based approach is based on a ~~four~~three-stage approach.

(a)   The first step is the overall assessment of both the bank's organisational infrastructure (including the definition and structure of trading desks) and its firm-wide internal risk capital model. These evaluations are based on both qualitative and quantitative factors. The quantitative factors are based on backtesting and are detailed further in the *Supervisory framework for the use of backtesting and profit and loss attribution in conjunction with the internal models approach to market risk capital measurement*.

(b)   The second step breaks the model approval process into smaller, more discrete, elements – the regulatory trading desks (as defined in paragraphs 27 to 31~~21 to 23~~). At this stage, banks must nominate which trading desks are in-scope for model approval and which trading desks are out-of-scope. Banks must specify in writing the basis for the nomination. Banks must not nominate desks to be out-of-scope due to standardised approach capital charges being less than the modelled requirements. Desks that are out-of-scope will be capitalised according to the standardised approach on a portfolio basis. Desks that opt out of the internal models approach at this stage must remain ineligible for model inclusion for a period of at least one year.

For those desks that the bank has deemed to be in-scope for the internal models approach, model approval is required at the trading desk level. Each trading desk must satisfy P&L attribution, and backtesting requirements ~~and a model-independent risk assessment tool~~ on an ongoing basis.

Backtesting requirements are based on comparing each desk's 1-day static value-at-risk measure at both the 97.5th percentile and the 99th percentile, using at least one year of current observations of the desk's one-day P&L.[43]~~.~~ If any given desk experiences either more than [12] exceptions at the 99th percentile or [30] exceptions at the 97.5th percentile in the most recent

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[43]   Risk factors that are captured in the CVA capital framework, can be excluded from the P&L for the purpose of the backtesting requirements in the market risk framework.

12-month period, all of its positions must be capitalised using the standardised approach.[44] Positions must continue to be capitalised using the standardised method until the desk no longer exceeds the above thresholds over the prior 12 months.

P&L attribution requirements are based on two metrics: mean unexplained daily P&L (ie risk-theoretical P&L minus ~~actual~~hypothetical P&L) over the standard deviation of ~~actual~~hypothetical daily P&L ~~(excluding the impact of new transactions)~~ and the ratio of variances of unexplained daily P&L and ~~actual~~hypothetical daily P&L ~~(excluding the impact of new transactions)~~. These ratios are calculated monthly and reported prior to [the end of the following month]. If the first ratio is outside of the range of [-10% to +10%] or if the second ratio were in excess of [20%] then the desk experiences a breach. If the desk experiences four or more breaches within the prior 12 months then it must be capitalised under the standardised approach. The desk must remain on the standardised approach until it can pass the monthly P&L attribution requirement and provided it has satisfied its backtesting exceptions requirements. Trading desks that do not satisfy the minimum backtesting and~~,~~ P&L attribution ~~and model-independent risk assessment tool~~ requirements are ineligible for capitalisation using the internal models approach. Risk exposures within these ineligible desks must be included with the out-of-scope desks and capitalised according to the standardised methodology on a portfolio basis.

For an institution to remain eligible for capitalisation under the internal models approach, a minimum of [10%] of the bank's aggregated market risk capital charges must be based on positions held in desks that qualify for inclusion in the bank's internal model for regulatory capital.

(c)   Step three is a risk factor analysis. Following the identification of eligible trading desks, this step will determine which risk factors within the identified desks are eligible to be included in the bank's internal models for regulatory capital. For a risk factor to be classified as modellable by a bank, there must be continuously available "real" prices for a sufficient set of representative transactions. A price will be considered "real" if:

- It is a price at which the institution~~s~~ has conducted a transaction;

- It is a verifiable price for an actual transaction between other arms-length parties; or

- The price is obtained from a committed quote.

To be considered ~~modellable~~to have continuously available "real" prices, a risk factor should have at least 24 observable "real" prices~~tions~~ per year (measured over the period used to calibrate the current expected shortfall model) with a maximum period of one month between two consecutive observations.[45] Any "real" price that is observed for a transaction should be counted as an observation for all of the risk factors concerned (ie all risk factors which are used to model the risk of the instrument that is bough, sold or generated through the transaction as part of the overall portfolio). Risk factors derived from other modellable risk factors can be classified as modellable.

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[44] Desks with exposure to issuer default risk ~~credit risk exposure~~must pass a two-stage approval process. First, the market risk model must pass backtesting and P&L attribution. Conditional on approval of the market risk model, the desk than may apply for approval to model incremental default risk (paragraph 176~~186~~). Desks that fail either test must be capitalised under the standardised approach.

[45] In particular, a bank may add modellable risk factors, and replace non-modellable risk factors by a basis between these additional modellable risk factors and these non-modellable risk factors. This basis will then be considered as a non-modellable risk factor. A combination between modellable and non-modellable risk factors will be a non-modellable risk factor.

Once a risk factor is deemed modellable, the bank should choose the most appropriate data to calibrate its model – the data used for calibration does not need to be the same data used to prove that the risk factor is modellable.

Where a risk factor deemed modellable is not available during the historical period used for stressed calibration, proxy data may be used provided the general approach for generating old missing data must be documented and part of the independent review of the internal model by the bank's supervisory authority.

Some risk factors that would be considered modellable under the above criteria may be temporarily excluded from a bank's firm-wide regulatory capital model. In these circumstances, the bank will be given [12 months] to include the relevant risk factors in the regulatory capital model.

(d)   Step four is a model-independent risk assessment tool for desks. Each desk must calculate these three items:

(vi)   *Capital*: the desk-level Expected Shortfall (ES) plus the sum of capital requirements emerging from the stress scenario add-ons under the non-modellable risk factors framework. The ES calculated for the desk should factor in varying liquidity horizons in risk factors, but be defined before any regulatory multipliers (eg those imposed as a result of poor backtesting performance).

(vii)   *Exposure measure*: The exposure measure for the desk calculated as set out in the consultative paper "Revised Basel III leverage ratio framework and disclosure requirements" published by the Committee in June 2013.[46]

(viii)   *Threshold*: as set out in the following table:

Desk description	Threshold (%)
[to be determined following the QIS]	[to be determined following the QIS]

The bank must test each desk against the threshold as follows. If the following inequality is breached then the model-based method may not be used and the desk must use the standardised approach.

$$\frac{Capital}{Exposure\,Measure} < Threshold$$

6.   Interaction with the standardised approach methodology

174.   Banks must calculate the standardised capital charge for each trading desk as if it were a standalone regulatory portfolio. This calculation must be performed at least monthly and will:

(a)   Serve as an indication of the fallback capital charge for those desks that fail the eligibility criteria for inclusion in the bank's internal model (as outlined in paragraphs 1780 and 1781).

(b)   Generate information on the capital outcomes of the internal models relative to a consistent benchmark and facilitate comparison in implementation between banks and/or across jurisdictions.

(c)   Monitor over time the relative calibration of standardised and modelled approaches, facilitating adjustments as needed.

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[46]   www.bis.org/publ/bcbs251.pdf.

(d)   Provide macroprudential insight in an ex ante consistent format.

7.   Specification of market risk factors

175.   An important part of a bank's internal market risk measurement system is the specification of an appropriate set of market risk factors, ie the market rates and prices that affect the value of the bank's trading positions. The risk factors contained in a market risk measurement system should be sufficient to capture the risks inherent in the bank's portfolio of on- and off-balance sheet trading positions. Although banks will have some discretion in specifying the risk factors for their internal models, the following requirements should be fulfilled.

(a)   Factors that are deemed relevant for pricing should be included as risk factors in the bank's internal models. Where a risk factor is incorporated in a pricing model but not in the risk capital model, the bank must justify this omission to the satisfaction of its supervisor. Similarly, the ES model should include all risk factors corresponding to the regulatory risk factors specified under the Standardised Approach or prove to its supervisor the immateriality of these risk factors for its trading positions. In addition, the ES model and any stress scenarios calculated for non-modellable risk factors must capture non-linearities for options and other relevant products (eg mortgage-backed securities), as well as correlation risk and relevant basis risks (eg between credit default swaps and bonds). Moreover, the supervisor has to be satisfied that proxies are used which show a good track record for the actual position held (ie an equity index for a position in an individual stock).

(b)   For *interest rates*, there must be a set of risk factors corresponding to interest rates in each currency in which the bank has interest rate-sensitive on- or off-balance sheet positions. The risk measurement system should model the yield curve using one of a number of generally accepted approaches, for example, by estimating forward rates of zero coupon yields. The yield curve should be divided into various maturity segments in order to capture variation in the volatility of rates along the yield curve; there will typically be one risk factor corresponding to each maturity segment. For material exposures to interest rate movements in the major currencies and markets, banks must model the yield curve using a minimum of [six] risk factors. However, the number of risk factors used should ultimately be driven by the nature of the bank's trading strategies. For instance, a bank with a portfolio of various types of securities across many points of the yield curve and that engages in complex arbitrage strategies would require a greater number of risk factors to capture interest rate risk accurately. For *credit* the risk measurement system must incorporate separate risk factors to capture spread risk (eg between bonds and swaps). A variety of approaches may be used to capture the spread risk arising from less than perfectly correlated movements between government and other fixed-income interest rates, such as specifying a completely separate yield curve for non-government fixed-income instruments (for instance, swaps or municipal securities) or estimating the spread over government rates at various points along the yield curve.

(c)   For *exchange rates* (which may include gold), the risk measurement system should incorporate risk factors corresponding to the individual foreign currencies in which the bank's positions are denominated. Since the expected shortfall figure calculated by the risk measurement system will be expressed in the bank's domestic currency, any net position denominated in a foreign currency will introduce a foreign exchange risk. Thus, there must be risk factors corresponding to the exchange rate between the domestic currency and each foreign currency in which the bank has a significant exposure.

(d)   For *equity prices*, there should be risk factors corresponding to each of the equity markets in which the bank holds significant positions:

- At a minimum, there should be a risk factor that is designed to capture market-wide movements in equity prices (eg a market index). Positions in individual securities or in sector indices could be expressed in "beta-equivalents" relative to this market-wide index;

- A somewhat more detailed approach would be to have risk factors corresponding to various sectors of the overall equity market (for instance, industry sectors or cyclical and non-cyclical sectors). As above, positions in individual stocks within each sector could be expressed in beta-equivalents relative to the sector index;

- The most extensive approach would be to have risk factors corresponding to the volatility of individual equity issues.

- The sophistication and nature of the modelling technique for a given market should correspond to the bank's exposure to the overall market as well as its concentration in individual equity issues in that market.

(e)   For *commodity prices*, there should be risk factors corresponding to each of the commodity markets in which the bank holds significant positions.

- For banks with relatively limited positions in commodity-based instruments, a straightforward specification of risk factors would be acceptable. Such a specification would likely entail one risk factor for each commodity price to which the bank is exposed (including different risk factors for different geographies where relevant). In cases where the aggregate positions are quite small, it might be acceptable to use a single risk factor for a relatively broad sub-category of commodities (for instance, a single risk factor for all types of oil);

- For more active trading, the model must also take account of variation in the "convenience yield"[47] between derivatives positions such as forwards and swaps and cash positions in the commodity.

(f)   All securitised products are ineligible for inclusion in the models-based capital charge and must be capitalised using the standardised approach.

8.   Default risk

176.   Banks must have a separate internal model to measure the default risk of trading book positions. The general criteria in paragraphs 1676 to 16978 and the qualitative standards in paragraph 1780 also apply to the default risk model.

(a)   Default risk is the risk of direct loss due to an obligor's default as well as the potential for indirect losses that may arise from a default event.

(b)   Default risk must be measured using a VaR model. Banks must use a ~~two-factor~~ default simulation model with two types of systematic risk factors. ~~d~~Default correlations must be based on credit spreads or on listed equity prices. Banks must have clear policies and procedures that describe the correlation calibration process, documenting in particular in which cases credit spreads or equity prices are used. Correlations must be based on a period of stress (as defined in paragraph 1781(d)), estimated over a 10-year time horizon and be based on a [one]-year liquidity horizon. The VaR calculation must be done weekly and be based on a one-year time horizon at a one-tail, 99.9th percentile confidence level.

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[47]   The convenience yield reflects the benefits from direct ownership of the physical commodity (for example, the ability to profit from temporary market shortages), and is affected both by market conditions and by factors such as physical storage costs.

(c)   All positions subject to the market risk framework that have default risk as defined in paragraph 176(a), with the exception of those positions subject to standardised charges ~~or whose valuations depend solely on commodity prices or foreign exchange rates~~ are subject to the default risk model. Therefore, sovereign exposures (including those denominated in the sovereign's domestic currency), equity positions and defaulted debt positions must be included in the model. For equity positions, the default of an issuer must be modelled as resulting in the equity price dropping to zero.

(d)   The default risk charge model capital requirement is the greater of: (1) the average of the default risk charge model measures over the previous 12 weeks; or (2) the most recent default risk charge model measure.

(e)   A bank must assume constant positions over the one-year horizon.

(f)   Default risk must be measured for each obligor.

  •   PDs implied from market prices are not acceptable unless they are corrected to obtain an objective probability of default.[48]

  •   PDs are subject to a floor of 0.03%.

(g)   The model may reflect netting of long and short exposures to the same obligor, and if such exposures span different instruments with exposure to the same obligor, the effect of the netting must account for different losses in the different instruments (eg differences in seniority).

(h)   The basis risk between long and short exposures of different obligors must be modelled explicitly. The potential for offsetting default risk among long and short exposures across different obligors must be included through the modelling of defaults. The pre-netting of positions before input into the model other than as described in (g) is not allowed.

(i)   The default risk charge model must recognise the impact of correlations between defaults among obligors, including the effect on correlations of periods of stress as described in (b).

  •   These correlations should be based on objective data and not chosen in an opportunistic way where a higher correlation is used for portfolios with a mix of long and short positions and a low correlation used for portfolios with long only exposures.

  •   A bank must validate that its modelling approach for these correlations is appropriate for its portfolio, including the choice and weights of its systematic risk factors. A bank must document its modelling approach and the period of time used to calibrate the model.

  •   These correlations must be measured over a liquidity horizon of one year.

  •   These correlations should be calibrated over a period of at least 10 years.

  •   Firms need to reflect all significant basis risks in recognising these correlations, including, for example, maturity mismatches, internal or external ratings, vintage etc.

(j)   The model must capture any material mismatch between a position and its hedge.

(k)   The model must reflect the effect of issuer and market concentrations, as well as concentrations that can arise within and across product classes during stressed conditions.

(l)   As part of this default risk charge model, the bank must calculate, for each and every position subjected to the model, an incremental loss amount relative to the current valuation that the bank would incur in the event that the obligor of the position defaults.

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[48]   In other words, market implied PDs are not acceptable.

(m)   These loss estimates must reflect the economic cycle; for example, the model must incorporate the dependence of the recovery on the systemic risk factors.

(n)   The model must reflect the non-linear impact of options and other positions with material non-linear behaviour with respect to default. In the case of equity derivatives positions with multiple underliers, simplified modelling approaches (for example modelling approaches that rely solely on individual jump-to-default sensitivities to estimate losses when multiple underliers default) may be applied (subject to supervisory approval).

(o)   To avoid double counting of the risk from mark-to-market loss and the risk of loss from default, the model may assess dDefault risk must be assessed from the perspective of the incremental loss from default in excess of the mark-to-market losses already taken at the time of defaultinto account in the current valuation.

(p)   Owing to the high confidence standard and long capital horizon of the IDRDefault Risk Charge (DRC), robust direct validation of the IDR DRC model through standard backtesting methods at the 99.9%/one-year soundness standard will not be possible. Accordingly, validation of an IRC DRC model necessarily must rely more heavily on indirect methods including but not limited to stress tests, sensitivity analyses and scenario analyses, to assess its qualitative and quantitative reasonableness, particularly with regard to the model's treatment of concentrations. Given the nature of the IDR DRC soundness standard such tests must not be limited to the range of events experienced historically. The validation of an IDRC model represents an ongoing process in which supervisors and firms jointly determine the exact set of validation procedures to be employed.

(q)   Firms should strive to develop relevant internal modelling benchmarks to assess the overall accuracy of their IDR DRC models.

(r)   Due to the unique relationship between credit spread and default risk, banks must seek approval for each desk with exposure to these risks, both for credit spread risk and default risk. Desks which do not receive approval will be deemed ineligible for internal modelling standards and be subject to the standardised capital framework.

(s)   PD estimates should adhere to the following standards:

•   Where an institution has approved PD estimates as part of the internal ratings-based (IRB) approach, this data must be used. Where such estimates do not exist, PDs should be computed using a methodology consistent with the IRB methodology unless otherwise specified below.

•   Risk neutral PDs should not be used as estimates of observed (historical) PDs.

•   PDs should be measured based on historical default data including both formal default events and price declines equivalent to default losses. Where possible, this data should be based on publicly traded securities over a complete economic cycle. The minimum historical observation period for calibration purposes is 5 years.

•   PDs should be estimated based on historical data of default frequency over a one year period. The PD may also be calculated on a theoretical basis (eg geometric scaling) provided that the bank is able to demonstrate that such theoretical derivations are in line with historical default experience.

•   PDs provided by external sources may also be used by institutions, provided they can be shown to be relevant for the bank's portfolio.

(t)   LGD estimates should adhere to the following standards:

•   Where an institution has approved LGD estimates as part of the internal ratings based (IRB) approach, this data must be used. Where such estimates do not exist, LGDs

should be computed using a methodology consistent with the IRB methodology unless otherwise specified below.

- LGDs should be determined from a market perspective, based on a position's current market value less the position's expected market value subsequent to default. The LGD should reflect the type and seniority of the position and may not be less than zero.

- LGDs should be based on an amount of historical data that is sufficient to derive robust, accurate estimates.

- LGDs provided by external sources may also be used by institutions, provided they can be shown to be relevant for the bank's portfolio.

(r)(u)   Banks should establish a hierarchy ranking their preferred sources for PDs and LGDs, in order to avoid the cherry-picking of parameters.

9.   Capitalisation of risk factors

177.   For those desks that are permitted to be on the internal models approach, all risk factors that are deemed to be "modellable" must be included in the bank's internal, firm-wide, expected shortfall model. The bank must calculate its internally modelled capital charge at the bank-wide level using this model, with no supervisory constraints on cross risk ~~factor~~class correlations (*IMCC(C)*).

178.   The bank must calculate a series of partial expected shortfall charges (ie all other risk factors should be held constant) for the range of broad regulatory risk factor classes (interest rate risk, equity risk, foreign exchange risk, commodity risk and credit risk). These partial expected shortfall values (*IMCC(C$_i$)*) will then be summed to provide an aggregated risk class ~~factor~~ expected shortfall charge.

179.   The aggregate capital charge for modellable risk factors (*IMCC*) is based on the weighted average of the constrained and unconstrained expected shortfall charges.

$$IMCC = \rho\left(IMCC\left(C\right)\right) + \left(1-\rho\right)\left(\sum_{i=1}^{R} IMCC\left(C_i\right)\right)$$

where $IMCC\left(C\right) = ES_{R,S} \times \dfrac{ES_{F,C}}{ES_{R,C}}$ and $IMCC\left(C_i\right) = ES_{R,S,\,i} \times \dfrac{ES_{F,C,\,i}}{ES_{R,C,\,i}}$ ~~.~~

The stress period used in the ~~desk~~risk class-level $ES_{R,S,i}$ should be the same as that used to calculate the portfolio-wide $ES_{R,S}$.

ρ is the relative weight assigned to the firm's internal model. The value of ρ is [X] [*to be determined by the Committee following the QIS. [X] will be consistent across jurisdictions and institutions.*]

For regulatory capital purposes, the aggregated charge associated with approved desks (C$_A$) is equal the maximum of the most recent observation and a weighted average of the previous ~~[12] weeks~~60 days scaled by a multiplier (m$_c$).

$$C_A = \max\left\{ IMCC_{t-1} + SES_{t-1}, m_c \cdot \left(IMCC_{avg} + SES_{avg}\right) \right\}$$

where *SES* is the aggregate regulatory capital measure for *K* risk factors in model-eligible desks that are deemed unmodellable.

The multiplication factor m$_c$ will be [~~3~~1] or set by individual supervisory authorities on the basis of their assessment of the quality of the bank's risk management system, subject to an absolute minimum of [~~3~~1]. Banks must add to this factor a "plus" directly related to the ex-post performance of the model, thereby introducing a built-in positive incentive to maintain the predictive quality of the model. The plus will range from 0 to 0.33~~1~~ based on the outcome of the backtesting of the bank's *daily*

VaR at the 99th percentile based on current observations on the full set of risk factors *(VaR$_{FC}$)*. If the backtesting results are satisfactory and the bank meets all of the qualitative standards set out in paragraph 170~~180~~, the plus factor could be zero. Appendix B presents in detail the approach to be applied for backtesting and the plus factor. Banks must develop the capability to perform backtests using both hypothetical (ie using changes in portfolio value that would occur were end-of-day positions to remain unchanged) and actual trading (~~ie~~ excluding fees~~,~~ and commissions~~, and net interest income~~) outcomes[49]. The multiplication factor will~~, however,~~ be based upon ~~[hypothetical~~the maximum of the exceptions generated by the two~~]~~ backtesting results.

180.   Each non-modellable risk factor is to be capitalised using a stress scenario that is calibrated to be at least as prudent as the expected shortfall calibration used for modelled risks (ie a loss calibrated to a 97.5% confidence threshold over a period of extreme stress for the given risk factor). For each non-modellable risk factor, the liquidity horizon of the stress scenario should be the greater of the largest time interval between two consecutive price observations over the prior year and the liquidity horizon assigned to the risk factor in paragraph 171~~181~~. No correlation or diversification effect between non-modellable risk factors should be assumed. In the event that a bank cannot provide a stress scenario which is acceptable for the supervisor, the bank will have to use the maximum possible loss as the stress scenario.

The aggregate regulatory capital measure for *K* risk factors in model-eligible desks that are deemed unmodellable *(SES)* is:

$$SES = \sum_{j=1}^{K} SES_{NM,j}$$

~~W~~where *SES$_{NM,j}$* is the stress scenario capital charge for non-modellable risk *j*.

181.   The additional regulatory capital charge for modellable risk positions subject to default risk is ~~*IDR*~~ *DRC* (as described in paragraph 176~~186~~ above).

182.   The aggregate capital charge for those desks eligible for the internal models approach is equal to the aggregate capital charge for modellable risk factors (*C$_{A,M}$*) plus the sum of the individual capital requirements for non-modellable risk factors (*C$_{A,U}$*) plus the charge for ~~incremental~~ default risk charge model (~~*IDR*~~*DRC*).

183.   The regulatory capital charge associated with risks from unapproved desks (Cu) is to be calculated by aggregating all such risks and applying the standardised charge.

$$C_U = \sum_{l=1}^{N'} SM_l$$

~~where *SM$_l$* is the standardised charge for desk *l* of *N'* unapproved desks.~~

184.   The aggregate capital charge for market risk (*ACC*) ~~under the internal models approach~~ is equal to the aggregate capital requirement for eligible trading desks plus the standardised capital charge for risks from ~~ineligible~~ unapproved trading desks.

$$ACC = C_A + \underline{DRC}\cancel{IDR} + C_U$$

$$ACC = C_A + IDR + C_U$$

[49]   To the extent that risk factors are captured in the CVA capital framework, their impact on the CVA component of the fair value of financial instruments has to be excluded from the P&L for the purpose of the market risk framework; In addition, the impact on the DVA component of the fair value of financial instruments also have to be excluded from the P&L. Any other fair value adjustments need to be included in the P&L.

10.   Stress testing

185.   Banks that use the internal models approach for meeting market risk capital requirements must have in place a rigorous and comprehensive stress testing program at both the trading desk and bank-wide level. Stress testing to identify events or influences that could greatly impact banks is a key component of a bank's assessment of its capital position.

186.   Banks' stress scenarios need to cover a range of factors that can create extraordinary losses or gains in trading portfolios, or make the control of risk in those portfolios very difficult. These factors include low-probability events in all major types of risk, including the various components of market, credit, and operational risks. Stress scenarios need to shed light on the impact of such events on positions that display both linear and non-linear price characteristics (ie options and instruments that have option-like characteristics).

187.   Banks' stress tests should be both of a quantitative and qualitative nature, incorporating both market risk and liquidity aspects of market disturbances. Quantitative criteria should identify plausible stress scenarios to which banks could be exposed. Qualitative criteria should emphasise that two major goals of stress testing are to evaluate the capacity of the bank's capital to absorb potential large losses and to identify steps the bank can take to reduce its risk and conserve capital. This assessment is integral to setting and evaluating the bank's management strategy and the results of stress testing should be routinely communicated to senior management and, periodically, to the bank's board of directors.

188.   Banks should combine the use of supervisory stress scenarios with stress tests developed by banks themselves to reflect their specific risk characteristics. Specifically, supervisory authorities may ask banks to provide information on stress testing in three broad areas, which are discussed in turn below.

Supervisory scenarios requiring no simulations by the bank

189.   Banks should have information on the largest losses experienced during the reporting period and should make this available for supervisory review. This loss information could be compared to the level of capital that results from a bank's internal measurement system. For example, it could provide supervisory authorities with a picture of how many days of peak day losses would have been covered by a given expected shortfall estimate.

Scenarios requiring a simulation by the bank

190.   Banks should subject their portfolios to a series of simulated stress scenarios and provide supervisory authorities with the results. These scenarios could include testing the current portfolio against past periods of significant disturbance, for example, the 1987 equity crash, the Exchange Rate Mechanism crises of 1992 and 1993, the increase in interest rates in the first quarter of 1994, the 1998 Russian financial crisis, the 2000 bursting of the technology stock bubble, the 2007–08 sub-prime crisis, or the 2011–12 euro zone crisis, incorporating both the large price movements and the sharp reduction in liquidity associated with these events. A second type of scenario would evaluate the sensitivity of the bank's market risk exposure to changes in the assumptions about volatilities and correlations. Applying this test would require an evaluation of the historical range of variation for volatilities and correlations and evaluation of the bank's current positions against the extreme values of the historical range. Due consideration should be given to the sharp variation that at times has occurred in a matter of days in periods of significant market disturbance. For example, the above-mentioned situations involved correlations within risk factors approaching the extreme values of 1 or –1 for several days at the height of the disturbance.

Scenarios developed by the bank itself to capture the specific characteristics of its portfolio.

191.   In addition to the scenarios prescribed by supervisory authorities under paragraphs 199 and 200189 and 190, a bank should also develop its own stress tests which it identifies as most adverse

based on the characteristics of its portfolio (eg problems in a key region of the world combined with a sharp move in oil prices). Banks should provide supervisory authorities with a description of the methodology used to identify and carry out the scenarios as well as with a description of the results derived from these scenarios.

192.   The results should be reviewed periodically by senior management and should be reflected in the policies and limits set by management and the board of directors. Moreover, if the testing reveals particular vulnerability to a given set of circumstances, the national authorities would expect the bank to take prompt steps to manage those risks appropriately (eg by hedging against that outcome or reducing the size of its exposures).

11.   External validation

193.   The validation of models' accuracy by external auditors and/or supervisory authorities should at a minimum include the following steps:

(a)   Verifying that the *internal validation processes* described in paragraph ~~182 and 183~~172 and 173 are operating in a satisfactory manner;

(b)   Ensuring that the *formulae* used in the calculation process as well as for the pricing of options and other complex instruments are validated by a qualified unit, which in all cases should be independent from the trading area;

(c)   Checking that the *structure* of internal models is adequate with respect to the bank's activities and geographical coverage;

(d)   Checking the results of both the banks' *backtesting* of its internal measurement system (ie comparing expected shortfall estimates with actual profits and losses) and its *P&L attribution* process to ensure that the models provide a reliable measure of potential losses over time. This means that banks should make the results as well as the underlying inputs to their expected shortfall calculations and details of the P&L attribution exercise available to their supervisory authorities and/or external auditors on request; and

(e)   Making sure that data flows and processes associated with the risk measurement system are *transparent and accessible*. In particular, it is necessary that auditors and supervisory authorities are in a position to have easy access, whenever they judge it necessary and under appropriate procedures, to the models' specifications and parameters.

Appendix A

Trading desk definitions

For the purpose of regulatory capital calculations, a "trading desk" is defined as a group of traders or trading accounts (key element #1 below) that implements a well-defined business strategy (key element #2 below), operating within a clear risk management structure (key element #3 below), defined by the bank but with the definition approved by supervisors for capital purposes (key element #4 below).

Key element #1: a "trading desk" for the purposes of the regulatory capital framework is an unambiguously defined **group of traders or trading accounts**.

- An individual trader or trading account is an **indisputable and unambiguous unit of observation** in accounting for trading activity.

- The desk must have a **Head Trader**.

  - The head trader must have direct oversight of the group of traders or trading accounts.

  - Each trader or each trading account in the desk must have a clearly defined specialty(ies).

- **Each trader or each trading account must be assigned to only one trading desk.** For the Head Trader, his role may cut across several businesses. Nonetheless, a given trader can only be the Head Trader at one desk and not multiple desks.

- The desk must have a clear reporting line to bank senior management, and should have a clear and formal compensation policy clearly linked to the pre-established objectives of the desk.

Key element #2: a "trading desk" must have a **well-defined business strategy.**

- There must be a clear description of the **economics** of the business strategy for the desk, its **primary activities** and **trading/hedging strategies**:

  - Economics: what is the economics behind the strategy (eg trading on shape of the yield curve)? How much of the activities are customer-driven? Does it entail trade origination and structuring, or execution services, or both?

  - Primary activities: what is the list of **permissible instruments** and, out of this list, which are the instruments most frequently traded?

  - Trading/hedging strategies: how would these instruments be hedged, what are the expected slippages and mismatches of hedges, and what is the expected holding period for positions?

- The management team at the desk (starting from the Head Trader) must have a clear annual plan for the budgeting and staffing of the desk.

- Regular Management Information reports, covering revenue, costs and risk-weighted assets for the desk.

Key element #3: a "trading desk" must have **a clear risk management structure**.

- Risk management responsibilities: the bank must identify key groups and personnel responsible for overseeing the risk-taking activities at the desk.

- Limits setting: the desk must have

- Well defined trading limits or directional exposures at the desk level that are based on the appropriate market risk metric (eg CS01 and/or JTD for a credit desk), or just overall notional limit.

- Well defined trader mandates.

- These limits must be reviewed at least annually by senior management at the firm.

- Risk reporting: the desk must produce, at least once a week

  - **P&L reports**, which would be periodically reviewed, validated and modified (if necessary) by Product Control.

  - I**nternal and regulatory risk measure reports**, including desk VaR/ES, desk VaR/ES sensitivities to risk factors, backtesting and p-value.

<u>Key element #4</u>: a "trading desk" must be **proposed by the bank** but **approved by supervisors**.

- The bank should be allowed to propose the trading desk structure per their organisational structure, consistent with the requirements in key elements #1 to #3 above.

- The bank must prepare a policy document for each desk it defines, documenting how the desk satisfies key elements #1 to #3 above.

- Supervisors will treat the definition of the trading desk as part of the initial model approval for the desk, as well as ongoing approval:

  - Supervisors may determine, based on the size of the bank's overall trading operations, whether the proposed desk definitions are sufficiently granular.

  - Supervisors should check that the bank's proposed definition of trading desk meets the criteria listed in Key elements #1, #2 and #3.

Appendix B

Supervisory framework for the use of backtesting and profit and loss attribution in conjunction with the internal models approach to market risk capital requirements

I.   Introduction

This document presents the framework developed by the Basel Committee on Banking Supervision ("the Committee") for incorporating backtesting and profit and loss (P&L) attribution into the internal models approach to market risk capital requirements. It represents an elaboration of paragraph ~~183~~ 173 of the internal models ~~rules~~ Accord text.

P&L attribution and backtesting are critical components of the revised internal models approach for capitalising trading activities. In order for a bank to obtain approval to use internal models to capitalise its trading exposures, it must meet several qualitative and quantitative criteria (outlined in paragraphs ~~180 and 181~~ 170 and 171). A key component of these requirements is that the bank demonstrates that its internal models, both at the firm-wide level and for individual trading desks, can model P&L behaviour with an appropriate degree of accuracy.

The essence of both P&L attribution and backtesting efforts is the comparison of actual trading results with model-generated risk measures. If this comparison is close enough, the tests raise no issues regarding the quality of the risk measurement models. In some cases, however, the comparison uncovers sufficient differences that problems almost certainly must exist, either with the model or with the assumptions of the backtest. In between these two cases is a grey area where the test results are, on their own, inconclusive.

The Committee believes that the framework outlined in this document strikes an appropriate balance between recognition of the potential limitations of P&L attribution and backtesting and the need to put in place appropriate constraints on the use of internal models (as well as incentives for model improvement).

The remainder of this document describes the P&L attribution/backtesting framework that accompanies the internal models capital requirement. The next section deals with the nature of the tests themselves, while the section that follows concerns the supervisory interpretation of the results and sets out the agreed standards of the Committee in this regard.

II.   Description of the P&L attribution and backtesting frameworks at the trading desk level

The P&L attribution and backtesting frameworks developed by the Committee consist of a periodic comparison of the bank's daily risk measures (expected shortfall or value at risk) with the subsequent daily profit or loss ("trading outcome"). The risk measures are intended to be larger than all but a certain fraction of the trading outcomes, where that fraction is determined by the confidence level of the risk measure. Comparing the risk measures with the trading outcomes for backtesting purposes simply means that the bank counts the number of times that the risk measures were larger than the trading

outcome. The fraction actually covered can then be compared with the intended level of coverage to gauge the performance of the bank's risk model.

P&L attribution

For the P&L attribution assessment, all of the instruments held within a particular trading desk would be identified and considered as a distinct portfolio. All of the risk factors for that portfolio that enter into the desk's risk management model and that contribute to the regulatory capital calculation would be used to calculate a "risk-theoretical" P&L. This "risk-theoretical" P&L is defined as the daily P&L explained produced by the observed daily variations of the risk factors included in the internal model capital charge computation or in the stress scenarios used to define the aggregate capital charge for market risk, and by the pricing functions (or approximations) used to determine these quantities. Observed movements in all risk factors contained in the firm's internal capital model on a given day should be used to calculate a risk-theoretical P&L for that day. Observed movements in risk factors can be included when constructing risk-theoretical P&L, even if the forecasting component of the internal model uses data that incorporates additional residual risk. For example, a firm using a multi factor beta-based index model to capture event risk might include alternative data in the calibration of the residual component (possibly reflecting grade or asset type) to reflect potential events not observed in the name-specific historical time series. The fact that the name is a risk factor in the model, albeit modelled in a multi-factor model environment, means that, in the P&L attribution, the firm would include the actual return of the name in both the hypothetical P&L and risk theoretical P&L and get recognition for the risk factor coverage of the model. The calculation of the risk-theoretical P&L should be based on the pricing models embedded in the firm's ES model and not front office pricing systems.

This risk-theoretical P&L would be compared to the actual hypothetical daily desk-level P&L (excluding the impact of new trades), based on the mark-to-market value of the trading desk's instruments used for the books and records of the bank. The P&L attribution should not take into account any risk factors that the bank does not include in its desk's risk management model.

The desk's risk management model, for the above purpose, includes all risk factors which the bank includes in its internal ES model. These may include any risk factors that the supervisor subsequently deems to be unmodellable and for which capital requirements are calculated based on individual stress scenarios.

This comparison between the risk-theoretical and actual hypothetical P&L is performed to determine whether the risk factors included in the desk's risk management model capture the material drivers of the bank's actual P&L used for its books and records. A significant degree of association between the two P&L measures, observed over a suitable time period, would be required for the trading desk to be deemed eligible for internal modelling. The Committee accepts that the risk-theoretical P&L can vary from the actual hypothetical daily P&L for a number of reasons. However, the rationale for this assessment is that a desk's risk management model should provide a reasonably accurate assessment of the risks of a trading desk to be deemed eligible for the internal models-based approach.

The P&L attribution requirements are based on two metrics:

- The mean of the difference between the risk-theoretical and actualhypothetical P&L (unexplained P&L) divided by the standard deviation of the actualhypothetical P&L; and

- The variance of the unexplained P&L divided by the variance of the actualhypothetical P&L.

Banks are required to estimate and report these ratios for each trading desk on a monthly basis. The decision to include or exclude a specific desk in the perimeter of the internal model would be taken if the averages of the proposed measures are inside supervisory-specified thresholds (as defined in paragraph 173183]) over a given period.

Backtesting assessment

In addition to P&L attribution, the performance of a trading desk's risk management models will be tested through daily backtesting. The backtesting assessment is considered to be complementary to the P&L attribution assessment when determining the eligibility of a trading desk for the internal models-based approach. The backtests to be applied compare whether the observed percentage of outcomes covered by the risk measure is consistent with both a *97.5% and 99% level of confidence*. The number of permitted exceptions is detailed in paragraph ~~183~~173.

Together, P&L attribution and backtesting thresholds would be used to determine which trading desks are eligible for internal model treatment for regulatory capital purposes. The designation of being ineligible for internal modelling is not, however, envisaged as being permanent. If P&L attribution and backtesting performance sufficiently improved for a sufficient period of time, the designation for the relevant internal models-based approach could be changed from ineligible to eligible.

An additional consideration in specifying the appropriate risk measures and trading outcomes for P&L attribution and backtesting arises because the internally modelled risk measurement is generally based on the sensitivity of a static portfolio to instantaneous price shocks. That is, end-of-day trading positions are input into the risk measurement model, which assesses the possible change in the value of this static portfolio due to price and rate movements over the assumed holding period.

While this is straightforward in theory, in practice it complicates the issue of backtesting. For instance, it is often argued that neither expected shortfall nor value-at-risk measures can be compared against actual trading outcomes, since the actual outcomes will reflect changes in portfolio composition during the holding period. According to this view, the inclusion of fee income together with trading gains and losses resulting from changes in the composition of the portfolio should not be included in the definition of the trading outcome because they do not relate to the risk inherent in the static portfolio that was assumed in constructing the value-at-risk measure.

This argument is persuasive with regard to the use of risk measures based on price shocks calibrated to longer holding periods. That is, comparing the liquidity-adjusted time horizon 99th percentile risk measures from the internal models capital requirement with actual liquidity-adjusted time horizon trading outcomes would probably not be a meaningful exercise. In particular, in any given multi-day period, significant changes in portfolio composition relative to the initial positions are common at major trading institutions. For this reason, *the backtesting framework described here involves the use of risk measures calibrated to a one-day holding period*. Other than the restrictions mentioned in this paper, the test would be based on how banks model risk internally.

Given the use of one-day risk measures, it is appropriate to employ one-day trading outcomes as the benchmark to use in the backtesting program. The same concerns about "contamination" of the trading outcomes discussed above continue to be relevant, however, even for one-day trading outcomes. That is, there is a concern that the overall one-day trading outcome is not a suitable point of comparison, because it reflects the effects of intraday trading, possibly including fee income that is booked in connection with the sale of new products.

On the one hand, intraday trading will tend to increase the volatility of trading outcomes, and may result in cases where the overall trading outcome exceeds the risk measure. This event clearly does not imply a problem with the methods used to calculate the risk measure; rather, it is simply outside the scope of what the measure is intended to capture. On the other hand, including fee income may similarly distort the backtest, but in the other direction, since fee income often has annuity-like characteristics. Since this fee income is not typically included in the calculation of the risk measure, problems with the risk measurement model could be masked by including fee income in the definition of the trading outcome used for backtesting purposes.

Instructions: Impact study on the proposed frameworks for market risk and CVA risk

To the extent that ~~the P&L attribution and~~ backtesting programs are viewed purely as a statistical test of the integrity of the calculation of the risk measures, it is appropriate to employ a definition of daily trading outcome that allows for an "uncontaminated" test. To meet this standard, banks must have the capability to perform the tests based on the hypothetical changes in portfolio value that would occur were end-of-day positions to remain unchanged.

Backtesting ~~and P&L attribution~~ using actual daily profits and losses ~~are~~ is also a useful exercise~~s~~ since ~~they~~ it can uncover cases where the risk measures are not accurately capturing trading volatility in spite of being calculated with integrity.

For these reasons, *the Committee requires banks to develop the capability to perform these tests using both hypothetical and actual trading outcomes*. In combination, the two approaches are likely to provide a strong understanding of the relation between calculated risk measures and trading outcomes. The total number of backtesting exceptions for the purpose of the thresholds in paragraph 173 should be calculated as the maximum of the exceptions generate under hypothetical or actual trading outcomes.

The implementation of the P&L attribution and backtesting programme should formally begin on the date that the internal models capital requirement becomes effective. However, the model should be under observation until a one-year backtesting and P&L attribution report can confirm the quality of the model submitted for approval. During this period, a multiplier of [~~X~~1] should be applied in the calculation of capital requirements for that specific trading desk. *This does not preclude national supervisors from requesting backtesting and P&L attribution results prior to that date, and in particular does not preclude their usage, at national discretion, as part of the internal model approval process. Using the most recent 12 months of data yields approximately 250 daily observations for the purposes of backtesting. The national supervisor will use the number of exceptions (out of 250) generated by the bank's model as the basis for a supervisory response.* In many cases, there will be no response. In other cases, the supervisor may initiate a dialogue with the bank to determine if there is a problem with a bank's model. In the most serious cases, the supervisor may impose an increase in a bank's capital requirement or disallow use of the model.

III. Supervisory framework for the interpretation of backtesting results for the firm-wide risk model

(a) Definition of a backtesting exception / outlier

Backtesting the firm-wide risk model will be based on a VaR measure calibrated at a 99th percentile confidence level. An exception or an outlier occurs when either the actual or hypothetical~~theoretical~~ loss of a trading desk or of the firm-wide trading book registered in a day of the backtesting period is higher than the corresponding daily risk measure given by the model[50]. In the case when either the P&L or the risk measure is not available or impossible to compute, it will count as an outlier.

In the case where an outlier can be shown by the firm to relate to a non-modellable risk factor, and the capital requirement for that non-modellable risk factor exceeds the actual or hypothetical~~theoretical~~ loss for that day, it may be disregarded for the purpose of the overall backtesting process if the national supervisor is notified accordingly and does not object to this treatment. In these cases firms must document the history of the movement of the value of the relevant non-modellable risk factor, and have supporting evidence that the non-modellable risk factor has caused the relevant loss.

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[50] To the extent that risk factors are captured in the CVA capital framework, these can be excluded from the P&L for the purpose of the backtesting framework.

(b) Description of three-zone approach

The framework for the supervisory interpretation of backtesting results for the firm-wide capital model encompasses a range of possible responses, depending on the strength of the signal generated from the backtest. These responses are classified into three zones, distinguished by colours into a hierarchy of responses. The green zone corresponds to backtesting results that do not themselves suggest a problem with the quality or accuracy of a bank's model. The yellow zone encompasses results that do raise questions in this regard, but where such a conclusion is not definitive. The red zone indicates a backtesting result that almost certainly indicates a problem with a bank's risk model.

The Committee has agreed to standards regarding the definitions of these zones in respect of the number of exceptions generated in the backtesting program, and these are set forth below. To place these definitions in proper perspective, however, it is useful to examine the probabilities of obtaining various numbers of exceptions under different assumptions about the accuracy of a bank's risk measurement model.

(c) Statistical considerations in defining the zones

Three zones have been delineated and their boundaries chosen in order to balance two types of statistical error: (1) the possibility that an accurate risk model would be classified as inaccurate on the basis of its backtesting result, and (2) the possibility that an inaccurate model would not be classified that way based on its backtesting result.

Table 1 below reports the probabilities of obtaining a particular number of exceptions from a sample of 250 independent observations under several assumptions about the actual percentage of outcomes that the model captures (that is, these are binomial probabilities). For example, the left-hand portion of the Table 1 reports probabilities associated with an accurate model (that is, a true coverage level of 99%). Under these assumptions, the column labelled "exact" reports that exactly five exceptions can be expected in 6.7% of the samples.

Table 2

| | Model is accurate | | Model is inaccurate: Possible alternative levels of coverage | | | | | | | |
| | Coverage = 99% | | Coverage = 98% | | Coverage = 97% | | Coverage = 96% | | Coverage = 95% | |
	exact	type 1	exact	type 2	exact	type 2	exact	type 2	exact	type 2
0	8.1%	100.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1	20.5%	91.9%	3.3%	0.6%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%
2	25.7%	71.4%	8.3%	3.9%	1.5%	0.4%	0.2%	0.0%	0.0%	0.0%
3	21.5%	45.7%	14.0%	12.2%	3.8%	1.9%	0.7%	0.2%	0.1%	0.0%
4	13.4%	24.2%	17.7%	26.2%	7.2%	5.7%	1.8%	0.9%	0.3%	0.1%
5	6.7%	10.8%	17.7%	43.9%	10.9%	12.8%	3.6%	2.7%	0.9%	0.5%
6	2.7%	4.1%	14.8%	61.6%	13.8%	23.7%	6.2%	6.3%	1.8%	1.3%
7	1.0%	1.4%	10.5%	76.4%	14.9%	37.5%	9.0%	12.5%	3.4%	3.1%
8	0.3%	0.4%	6.5%	86.9%	14.0%	52.4%	11.3%	21.5%	5.4%	6.5%
9	0.1%	0.1%	3.6%	93.4%	11.6%	66.3%	12.7%	32.8%	7.6%	11.9%
10	0.0%	0.0%	1.8%	97.0%	8.6%	77.9%	12.8%	45.5%	9.6%	19.5%
11	0.0%	0.0%	0.8%	98.7%	5.8%	86.6%	11.6%	58.3%	11.1%	29.1%
12	0.0%	0.0%	0.3%	99.5%	3.6%	92.4%	9.6%	69.9%	11.6%	40.2%
13	0.0%	0.0%	0.1%	99.8%	2.0%	96.0%	7.3%	79.5%	11.2%	51.8%
14	0.0%	0.0%	0.0%	99.9%	1.1%	98.0%	5.2%	86.9%	10.0%	62.9%
15	0.0%	0.0%	0.0%	100.0%	0.5%	99.1%	3.4%	92.1%	8.2%	72.9%

Notes to Table 1: The table reports both exact probabilities of obtaining a certain number of exceptions from a sample of 250 independent observations under several assumptions about the true level of coverage, as well as type 1 or type 2 error probabilities derived from these exact probabilities.

The left-hand portion of the table pertains to the case where the model is accurate and its true level of coverage is 99%. Thus, the probability of any given observation being an exception is 1% (100% − 99% = 1%). The column labelled "exact" reports the probability of obtaining exactly the number of exceptions shown under this assumption in a sample of 250 independent observations. The column labelled "type 1" reports the probability that using a given number of exceptions as the cut-off for rejecting a model will imply erroneous rejection of an accurate model using a sample of 250 independent observations. For example, if the cut-off level is set at five or more exceptions, the type 1 column reports the probability of falsely rejecting an accurate model with 250 independent observations is 10.8%.

The right-hand portion of the table pertains to models that are inaccurate. In particular, the table concentrates of four specific inaccurate models, namely models whose true levels of coverage are 98%, 97%, 96% and 95% respectively. For each inaccurate model, the "exact" column reports the probability of obtaining exactly the number of exceptions shown under this assumption in a sample of 250 independent observations. The columns labelled "type 2" report the probability that using a given number of exceptions as the cut-off for rejecting a model will imply erroneous acceptance of an inaccurate model with the assumed level of coverage using a sample of 250 independent observations. For example, if the cut-off level is set at five or more exceptions, the type 2 column for an assumed coverage level of 97% reports the probability of falsely accepting a model with only 97% coverage with 250 independent observations is 12.8%.

The right-hand portion of the table reports probabilities associated with several possible inaccurate models, namely models whose true levels of coverage are 98%, 97%, 96%, and 95%, respectively. Thus, the column labelled "exact" under an assumed coverage level of 97% shows that five exceptions would then be expected in 10.9% of the samples.

Table 1 also reports several important error probabilities. For the assumption that the model covers 99% of outcomes (the desired level of coverage), the table reports the probability that selecting a given number of exceptions as a threshold for rejecting the accuracy of the model will result in an erroneous rejection of an accurate model ("type 1" error). For example, if the threshold is set as low as one exception, then accurate models will be rejected fully 91.9% of the time, because they will escape rejection only in the 8.1% of cases where they generate zero exceptions. As the threshold number of exceptions is increased, the probability of making this type of error declines.

Under the assumptions that the model's true level of coverage is not 99%, the table reports the probability that selecting a given number of exceptions as a threshold for rejecting the accuracy of the model will result in an erroneous acceptance of a model with the assumed (inaccurate) level of coverage ("type 2" error). For example, if the model's actual level of coverage is 97%, and the threshold for rejection is set at seven or more exceptions, the table indicates that this model would be erroneously accepted 37.5% of the time.

(d)   Definition of the green, yellow, and red zones

The results in the table in (c) also demonstrate some of the statistical limitations of backtesting. In particular, there is no threshold number of exceptions that yields both a low probability of erroneously rejecting an accurate model and a low probability of erroneously accepting all of the relevant inaccurate models. It is for this reason that the Committee has rejected an approach that contains only a single threshold.

Given these limitations, the Committee has classified outcomes for the backtesting of the firm-wide model into three categories. In the first category, the test results are consistent with an accurate model, and the possibility of erroneously accepting an inaccurate model is low (green zone). At the other extreme, the test results are extremely unlikely to have resulted from an accurate model, and the probability of erroneously rejecting an accurate model on this basis is remote (red zone). In between these two cases, however, is a zone where the backtesting results could be consistent with either accurate or inaccurate models, and the supervisor should encourage a bank to present additional information about its model before taking action (yellow zone).

Table 2 sets out the Committee's agreed boundaries for these zones and the presumptive supervisory response for each backtesting outcome, based on a sample of 250 observations. For other sample sizes, the boundaries should be deduced by calculating the binomial probabilities associated with true coverage of 99%, as in Table 1. The yellow zone begins at the point such that the probability of obtaining that number or fewer exceptions equals or exceeds 95%. Table 2 reports these cumulative probabilities for each number of exceptions. For 250 observations, it can be seen that five or fewer exceptions will be obtained 95.88% of the time when the true level of coverage is 99%. Thus, the yellow zone begins at five exceptions.

Similarly, the beginning of the red zone is defined as the point such that the probability of obtaining that number or fewer exceptions equals or exceeds 99.99%. Table 2 shows that for a sample of 250 observations and a true coverage level of 99%, this occurs with 10 exceptions.

Table 2

Zone	Number of exceptions	~~Increase in scaling factor~~multiplier	Cumulative probability
Green zone	0	~~0~~1.00	8.11%
	1	~~0~~1.00	28.58%
	2	~~0~~1.00	54.32%
	3	~~0~~1.00	75.81%
	4	~~0~~1.00	89.22%
Yellow zone	5	~~0.40~~1.13	95.88%
	6	1.17~~0.50~~	98.63%
	7	~~0.65~~1.22	99.60%
	8	~~0.7~~1.25~~5~~	99.89%
	9	~~0.85~~1.28	99.97%
Red zone	10 or more	1.3~~300~~	99.99%

Notes to Table 2: The table defines the green, yellow and red zones that supervisors will use to assess backtesting results in conjunction with the internal models approach to market risk capital requirements. The boundaries shown in the table are based on a sample of 250 observations. For other sample sizes, the yellow zone begins at the point where the cumulative probability equals or exceeds 95%, and the red zone begins at the point where the cumulative probability equals or exceeds 99.99%.

The cumulative probability is simply the probability of obtaining a given number or fewer exceptions in a sample of 250 observations when the true coverage level is 99%. For example, the cumulative probability shown for four exceptions is the probability of obtaining between zero and four exceptions.

Note that these cumulative probabilities and the type 1 error probabilities reported in Table 1 do not sum to one because the cumulative probability for a given number of exceptions includes the possibility of obtaining exactly that number of exceptions, as does the type 1 error probability. Thus, the sum of these two probabilities exceeds one by the amount of the probability of obtaining exactly that number of exceptions.

(e)　The green zone

The green zone needs little explanation. Since a model that truly provides 99% coverage would be quite likely to produce as many as four exceptions in a sample of 250 outcomes, there is little reason for concern raised by backtesting results that fall in this range. This is reinforced by the results in Table 1, which indicate that accepting outcomes in this range leads to only a small chance of erroneously accepting an inaccurate model.

(f)　The yellow zone

The range from five to nine exceptions constitutes the yellow zone. Outcomes in this range are plausible for both accurate and inaccurate models, although Table 1 suggests that they are generally more likely for inaccurate models than for accurate models. Moreover, the results in Table 1 indicate that the presumption that the model is inaccurate should grow as the number of exceptions increases in the range from five to nine.

The Committee has agreed that, within the yellow zone, the number of exceptions should generally guide the size of potential supervisory increases in a firm's capital requirement. Table 2 sets out the Committee's agreed guidelines for increases in the multiplication factor applicable to the internal models capital requirement, resulting from backtesting results in the yellow zone.

These particular values reflect the general idea that the increase in the multiplication factor should be sufficient to return the model to a 99th percentile standard. For example, five exceptions in a sample of 250 imply only 98% coverage. Thus, the increase in the multiplication factor should be sufficient to transform a model with 98% coverage into one with 99% coverage. Needless to say, precise

calculations of this sort require additional statistical assumptions that are not likely to hold in all cases. For example, if the distribution of trading outcomes is assumed to be normal, then the ratio of the 99th percentile to the 98th percentile is approximately 1.14, and the increase needed in the multiplication factor is therefore approximately ~~0.40~~1.13 for a ~~scaling factor~~multiplier of ~~3~~1. If the actual distribution is not normal, but instead has "fat tails", then larger increases may be required to reach the 99th percentile standard. The concern about fat tails was also an important factor in the choice of the specific increments set out in Table 2.

Banks should also document all of the exceptions generated from their ongoing backtesting program, including an explanation for the exception. Banks may also implement backtesting for confidence intervals other than the 99th percentile, or may perform other statistical tests not considered here. Naturally, this information could also prove very helpful in assessing their model.

In practice, there are several possible explanations for a backtesting exception, some of which go to the basic integrity of the model, some of which suggest an under-specified or low-quality model, and some of which suggest either bad luck or poor intraday trading results. Classifying the exceptions generated by a bank's model into these categories can be a very useful exercise.

Basic integrity of the model

1) The bank's systems simply are not capturing the risk of the positions themselves (eg the positions of an overseas office are being reported incorrectly).

2) Model volatilities and/or correlations were calculated incorrectly.

Model's accuracy could be improved

3) The risk measurement model is not assessing the risk of some instruments with sufficient precision (eg too few maturity buckets or an omitted spread).

"Bad luck" or markets moved in fashion unanticipated by the model

4) Random chance (a very low probability event).

5) Markets moved by more than the model predicted was likely (ie volatility was significantly higher than expected).

6) Markets did not move together as expected (ie correlations were significantly different than what was assumed by the model).

Intraday trading

7) There was a large (and money-losing) change in the bank's positions or some other income event between the end of the first day (when the risk estimate was calculated) and the end of the second day (when trading results were tabulated).

The supervisor will impose a higher capital requirement for any outcomes that place the bank in the yellow zone. In the case of severe problems with the basic integrity of the model, however, the supervisor should consider whether to disallow the use of the model for capital purposes altogether.

(g)   The red zone

Finally, outcomes in the red zone (10 or more exceptions) should generally lead to an automatic presumption that a problem exists with a bank's model. This is because it is extremely unlikely that an accurate model would independently generate 10 or more exceptions from a sample of 250 trading outcomes.

In general, therefore, if a bank's model falls into the red zone, the supervisor should automatically increase the multiplication factor applicable to a firm's model by ~~one~~ a third (from ~~one to three to four~~ one to 1.33). Needless to say, the supervisor should also begin investigating the reasons why the bank's model produced such a large number of misses, and should require the bank to begin work on improving its model immediately.

IV.   Conclusion

The above framework is intended to set out a consistent approach for incorporating P&L attribution and backtesting into the internal models approach to market risk capital requirements. The goals of this effort have been to build appropriate and necessary incentives into a framework that relies heavily on the efforts of banks themselves to calculate the risks they face, to do so in a way that respects the inherent limitations of the available tools, and to keep the burdens and costs of the imposed procedures to a minimum.

The Basel Committee believes that the framework described above strikes the right balance in this regard. Perhaps more importantly, however, the Committee believes that this approach represents the first, and therefore critical, step toward a tighter integration of supervisory guidelines with verifiable measures of bank performance.

E. Treatment for illiquid positions[51]

1. Prudent valuation guidance

718(c). This section provides banks with guidance on prudent valuation for positions that are accounted for at fair value, whether they are in the trading book or in the banking book. This guidance is especially important for positions without actual market prices or observable inputs to valuation, as well as less liquid positions which raise supervisory concerns about prudent valuation. The valuation guidance set forth below is not intended to require banks to change valuation procedures for financial reporting purposes. Supervisors should assess a bank's valuation procedures for consistency with this guidance. One factor in a supervisor's assessment of whether a bank must take a valuation adjustment for regulatory purposes under [paragraphs 718(cx) to 718(cxii)] should be the degree of consistency between the bank's valuation procedures and these guidelines.

718(ci). A framework for prudent valuation practices should at a minimum include the following:

[1.] Systems and controls

718(cii). Banks must establish and maintain adequate systems and controls sufficient to give management and supervisors the confidence that their valuation estimates are prudent and reliable. These systems must be integrated with other risk management systems within the organisation (such as credit analysis). Such systems must include:

- Documented policies and procedures for the process of valuation. This includes clearly defined responsibilities of the various areas involved in the determination of the valuation, sources of market information and review of their appropriateness, guidelines for the use of unobservable inputs reflecting the bank's assumptions of what market participants would use in pricing the position, frequency of independent valuation, timing of closing prices, procedures for adjusting valuations, end of the month and ad-hoc verification procedures; and

- Clear and independent (ie independent of front office) reporting lines for the department accountable for the valuation process. The reporting line should ultimately be to a main board executive director.

[2.] Valuation methodologies

Marking to market

718(ciii). Marking to market is at least the daily valuation of positions at readily available close out prices that are sourced independently. Examples of readily available close out prices include exchange prices, screen prices, or quotes from several independent reputable brokers.

718(civ). Banks must mark to market as much as possible. The more prudent side of bid/offer should be used unless the institution is a significant market-maker in a particular position type and it can close out at mid-market. Banks should maximise the use of relevant observable inputs and minimise the use of unobservable inputs when estimating fair value using a valuation technique. However, observable inputs or transactions may not be relevant, such as in a forced liquidation or distressed sale, or transactions may not be observable, such as when markets are inactive. In such cases, the observable data should be considered, but may not be determinative.

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[51] This section retains the paragraph numbering and references used in the existing Basel II Framework. These will be updated once the revised market risk framework is finalised by the Basel Committee.

Marking to model

718(cv) Only where marking to market is not possible should banks mark to model, but this must be demonstrated to be prudent. Marking to model is defined as any valuation which has to be benchmarked, extrapolated or otherwise calculated from a market input. When marking to model, an extra degree of conservatism is appropriate. Supervisory authorities will consider the following in assessing whether a mark-to-model valuation is prudent:

- Senior management should be aware of the elements of the trading book or of other fair-valued positions which are subject to mark to model and should understand the materiality of the uncertainty this creates in the reporting of the risk/performance of the business.

- Market inputs should be sourced, to the extent possible, in line with market prices (as discussed above). The appropriateness of the market inputs for the particular position being valued should be reviewed regularly.

- Where available, generally accepted valuation methodologies for particular products should be used as far as possible.

- Where the model is developed by the institution itself, it should be based on appropriate assumptions, which have been assessed and challenged by suitably qualified parties independent of the development process. The model should be developed or approved independently of the front office. It should be independently tested. This includes validating the mathematics, the assumptions and the software implementation.

- There should be formal change control procedures in place and a secure copy of the model should be held and periodically used to check valuations.

- Risk management should be aware of the weaknesses of the models used and how best to reflect those in the valuation output.

- The model should be subject to periodic review to determine the accuracy of its performance (eg assessing continued appropriateness of the assumptions, analysis of P&L versus risk factors, comparison of actual close out values to model outputs).

- Valuation adjustments should be made as appropriate, for example, to cover the uncertainty of the model valuation (see also valuation adjustments in paragraphs 718(cviii) to 718(cxii)).

Independent price verification

718(cvi) Independent price verification is distinct from daily mark to market. It is the process by which market prices or model inputs are regularly verified for accuracy. While daily marking to market may be performed by dealers, verification of market prices or model inputs should be performed by a unit independent of the dealing room, at least monthly (or, depending on the nature of the market/trading activity, more frequently). It need not be performed as frequently as daily mark to market, since the objective, ie independent, marking of positions, should reveal any error or bias in pricing, which should result in the elimination of inaccurate daily marks.

718(cvii) Independent price verification entails a higher standard of accuracy in that the market prices or model inputs are used to determine profit and loss figures, whereas daily marks are used primarily for management reporting in between reporting dates. For independent price verification, where pricing sources are more subjective, eg only one available broker quote, prudent measures such as valuation adjustments may be appropriate.

[3.]   Valuation adjustments

718(cviii) As part of their procedures for marking to market, banks must establish and maintain procedures for considering valuation adjustments. Supervisory authorities expect banks using third-party

valuations to consider whether valuation adjustments are necessary. Such considerations are also necessary when marking to model.

718(cix) Supervisory authorities expect the following valuation adjustments/reserves to be formally considered at a minimum: unearned credit spreads, close-out costs, operational risks, early termination, investing and funding costs, and future administrative costs and, where appropriate, model risk.

2. Adjustment to the current valuation of less liquid positions for regulatory capital purposes

718(cx) Banks must establish and maintain procedures for judging the necessity of and calculating an adjustment to the current valuation of less liquid positions for regulatory capital purposes. This adjustment may be in addition to any changes to the value of the position required for financial reporting purposes and should be designed to reflect the illiquidity of the position. Supervisory authorities expect banks to consider the need for an adjustment to a position's valuation to reflect current illiquidity whether the position is marked to market using market prices or observable inputs, third-party valuations or marked to model.

718(cxi) Bearing in mind that the assumptions made about liquidity in the market risk capital charge may not be consistent with the bank's ability to sell or hedge out less liquid positions, where appropriate, banks must take an adjustment to the current valuation of these positions, and review their continued appropriateness on an ongoing basis. Reduced liquidity may have arisen from market events. Additionally, close-out prices for concentrated positions and/or stale positions should be considered in establishing the adjustment. Banks must consider all relevant factors when determining the appropriateness of the adjustment for less liquid positions. These factors may include, but are not limited to, the amount of time it would take to hedge out the position/risks within the position, the average volatility of bid/offer spreads, the availability of independent market quotes (number and identity of market-makers), the average and volatility of trading volumes (including trading volumes during periods of market stress), market concentrations, the ageing of positions, the extent to which valuation relies on marking to model, and the impact of other model risks not included in paragraph 718(cx).

718(cxi-1-) For complex products including, but not limited to, securitisation exposures and n-th-to-default credit derivatives, banks must explicitly assess the need for valuation adjustments to reflect two forms of model risk: the model risk associated with using a possibly incorrect valuation methodology; and the risk associated with using unobservable (and possibly incorrect) calibration parameters in the valuation model.

718(cxii) The adjustment to the current valuation of less liquid positions made under paragraph 718(cxi) must impact Tier 1 regulatory capital and may exceed those valuation adjustments made under financial reporting standards and paragraphs 718(cviii) and 718(cix).

F. Supervisory Review Process – The Second Pillar[52]

Market risk

1. Policies and procedures for trading book eligibility

778(i). Clear policies and procedures used to determine the exposures that may be included in, and those that should be excluded from, the trading book for purposes of calculating regulatory capital are critical to ensure the consistency and integrity of a firm's trading book. Such policies must conform to paragraph 687(i) of this Framework. Supervisors should be satisfied that the policies and procedures clearly delineate the boundaries of the firm's trading book, in compliance with the general principles set forth in paragraphs 684 to 689(iii) of this Framework, and consistent with the bank's risk management capabilities and practices. Supervisors should also be satisfied that transfers of positions between banking and trading books can only occur in a very limited set of circumstances. A supervisor will require a firm to modify its policies and procedures when they prove insufficient for preventing the booking in the trading book of positions that are not compliant with the general principles set forth in paragraphs 684 to 689(iii) of this Framework, or not consistent with the bank's risk management capabilities and practices.

2. Valuation

778(ii). Prudent valuation policies and procedures form the foundation on which any robust assessment of market risk capital adequacy should be built. For a well diversified portfolio consisting of highly liquid cash instruments, and without market concentration, the valuation of the portfolio, combined with the minimum quantitative standards set out in paragraph 718(Lxxvi), as revised in this section, may deliver sufficient capital to enable a bank, in adverse market conditions, to close out or hedge its positions within 10 days in an orderly fashion. However, for less well diversified portfolios, for portfolios containing less liquid instruments, for portfolios with concentrations in relation to market turnover, and/or for portfolios which contain large numbers of positions that are marked to model this is less likely to be the case. In such circumstances, supervisors will consider whether a bank has sufficient capital. To the extent there is a shortfall the supervisor will react appropriately. This will usually require the bank to reduce its risks and/or hold an additional amount of capital.

3. Stress testing under the internal models approach

778(iii). A bank must ensure that it has sufficient capital to meet the minimum capital requirements set out in paragraphs 718(Lxx) to 718(xciv) and to cover the results of its stress testing required by paragraph 718(Lxxiv) (g), taking into account the principles set forth in paragraphs 738(ii) and 738(iv). Supervisors will consider whether a bank has sufficient capital for these purposes, taking into account the nature and scale of the bank's trading activities and any other relevant factors such as valuation adjustments made by the bank. To the extent that there is a shortfall, or if supervisors are not satisfied with the premise upon which the bank's assessment of internal market risk capital adequacy is based, supervisors will take the appropriate measures. This will usually involve requiring the bank to reduce its risk exposures and/or to hold an additional amount of capital, so that its overall capital resources at least cover the Pillar 1 requirements plus the result of a stress test acceptable to the supervisor.

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[52] This section retains the paragraph numbering and references used in the existing Basel II Framework. These will be updated once the revised market risk framework is finalised by the Basel Committee.

4. Specific risk modelling under the internal models approach

778(iv). ~~For banks wishing to model the specific risk arising from their trading activities, additional criteria have been set out, including conservatively assessing the risk arising from less liquid positions and/or positions with limited price transparency under realistic market scenarios.~~ Where supervisors consider that limited liquidity or price transparency undermine the effectiveness of a bank's model to capture ~~the specific~~ risk, they will take appropriate measures, including requiring the exclusion of positions from the bank's ~~specific risk~~ model. Supervisors should review the adequacy of the bank's measure of the ~~incremental~~default risk capital charge; where the bank's approach is inadequate, the use of the standardised ~~specific risk~~ charges will be required.

G.   Market Discipline – The Third Pillar[53]

Market risk[54]

Market risk: disclosures for all banks		[Table 10]
Qualitative disclosures	(a)	The general qualitative disclosure requirement [paragraph 824] for market risk including: - the desk structure of the firm; - types instruments included in each desk; - policies for determining whether a position is designated as trading, including the definition of stale positions, the market value of stale positions, and the nominal value of stale positions; - any positions assigned to the trading or banking book in contradiction of the general presumptions of their instrument category, and the market and nominal values of such positions; - differences in risk management practices and policies for any portfolios of covered positions that are split between the banking book and the trading book; - any positions that have been moved from one book to the other since the last reporting period, including the market and nominal values of such positions and the reason for the move; and the desks for which capital requirements are calculated using the standardised approach.
Quantitative disclosures	(b)	At the desk-level: - the total standardised capital charge for the desk; - the total standardised default risk charge for the desk; - the credit spread risk and incremental default risk (IDR) capital charge for securitisation positions on the desk; and - the numerator and denominator of the model-independent risk assessment tool At the top-level: - the total standardised capital charge for all positions, and including a breakdown by primary asset class (ie interest rates, FX, commodities, credit spread and equity); - the total standardised default risk charge; and - the credit spread risk and IDR capital charge for securitisation positions;

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[53]   The paragraph and table numbering in this section are based on the existing Basel II Framework. These will be updated once the revised market risk framework is finalised by the Basel Committee.

[54]   The proposed revisions to [Table 10] and [Table 11] will also be a component of a wider review by the Committee of Pillar 3 disclosure requirements.

Market risk: disclosures for banks using the internal models-based approach (IMA) for trading portfolios

[Table 11]

Qualitative disclosures	(a)	The general qualitative disclosure requirement [paragraph 824] for market risk including the portfolios covered by the IMA. In addition, a discussion of the extent of and methodologies for compliance with the "Prudent valuation guidance" for positions held in the trading book [paragraphs 690 to 701].
	(b)	The discussion should include an articulation of the soundness standards on which the bank's internal capital adequacy assessment is based. It should also include a description of the methodologies used to achieve a capital adequacy assessment that is consistent with the soundness standards.
	(c)	For each portfolio covered by the IMA: • the characteristics of the models used; • a description of stress testing applied to the portfolio; and • a description of the approach used for backtesting and P&L attribution, as well as any other means of validating the accuracy and consistency of the internal models and modelling processes.
	(d)	The scope of acceptance by the supervisor.
	(e)	For the incremental default risk (IDR) capital charge the methodologies used and the risks measured through the use of internal models, including details of the estimation of the parameters for the default model. It should also include the approaches used in the validation of the models.
	(f)	For each desk, the stress period used and a description of the process used to determine the stress period.
Quantitative disclosures	(g)	At each desk under the IMA: • The high, mean and low ES values over the reporting period and period-end; • The high, mean and low IDR capital charges over the reporting period and period-end; • The number of backtesting exceptions during the period, and the resulting multiplier; • The number of P&L attribution exceptions during the period; • The desk-level ES calculation, including a breakdown by individual risk factor; and • The capital charges for any risks not amenable to modelling. At the top-level: • The total expected shortfall calculation; • The difference between the bank-wide expected shortfall calculation and the simple sum of risk factor expected shortfall; • The total modelled IDR charge; and • The total capital charge.

Glossary

Actual daily ~~desk-level~~ P&L: The daily ~~desk-level~~ economic P&L based on the marking to market of the books and records of the bank excluding fees and commissions.

Backtesting: The process of comparing daily profits and losses with model-generated risk measures to gauge the quality and accuracy of risk measurement systems.

Basis risk: The risk that prices of financial instruments in a hedging strategy will move in a way that reduces the effectiveness of the hedging strategy.

Benchmark (in the context of the SMM/internal models-based approach relationship):

The use of SMM capital charges as a consistent metric of comparison of capital charges calculated using internal models-based approaches both across banks and through time.

Component risk factor: An instrument is decomposed into individual component risk factors that are then mapped to a risk factor class

"Cross-cutting" risk factor: A risk factor that affects the valuation of a large number of instruments across the trading book. Examples include exchange rates and interest rates from money market or swap curves.

Credit Valuation Adjustment (CVA): An adjustment to the valuation of a derivative transaction to account for the credit risk of contracting parties.

Current expected shortfall: ES based on current data history of the risk factors (in contrast to the stressed data history).

CVA risk: The risk of changes to CVA arising from changes in credit spreads of the contracting parties, perhaps compounded by changes to the value of the underlying of the derivative transaction.

Desk's risk management model: The desk's risk management model includes all risk factors that are included in the bank's internal ES with supervisory parameters. Risk factors deemed not modellable by the supervisor in Step 3, and which are therefore not included in the ES for calculating the respective regulatory capital charge, might be still included in the bank's internal ES.

Diversification: The process of constructing a portfolio of long or short positions in different instruments that are relatively uncorrelated with one another, in order to minimise exposure to individual risks, such as issuers or risk classes.

Expected holding period: The time period banks expect to hold risk positions as part of their documented trading strategies.

Endogenous liquidity: The relative effect on the sale price from the act of liquidating exposures or portfolios within a certain amount of time.

Fallback (in the context of the SMM /internal models-based approach relationship):

The process of requiring banks to switch to the SMM when internal models are not performing to adequate standards.

Financial instrument: Any contract that gives rise to both a financial asset of one entity and a financial liability or equity instrument of another entity. Financial instruments include both primary financial instruments (or cash instruments) and derivative financial instruments.

Floor (in the context of the SMM /internal models-based approach relationship): A level of capital charges (calculated as a percentage of the SMM capital charges) acting as a minimum to the Pillar 1 internal models-based capital charges.

Hedge: The process of counterbalancing risks from exposure to long and short positions in correlated instruments.

Hypothetical P&L: The P&L produced by revaluing the positions held at the end of the previous day using the market data at the end of the current day

Instrument: The term used to describe financial instruments and commodities (including electric power).

Liquidity horizon: The time required to exit or hedge a risk position without materially affecting market prices in stressed market conditions.

Liquidity premium: The additional premium demanded by investors to hold financial instruments that cannot be readily liquidated in the market.

Market risk: The risk of losses in on- and off-balance sheet risk positions arising from movements in market prices.

Notional position: The result of decomposing real-world financial instruments into simpler positions that can be capitalised under the standardised approach. In most cases notional positions will be equal to either the market value, "notional value", or the discounted cash flows of the instrument.

Notional value: The notional value of a derivative instrument is equal to the number of units underlying the instrument, multiplied by the current market value of each unit of the underlying.

Offset: The process of counterbalancing risks from exposure to long and short positions in the same instrument.

Pricing model: A model that is used to determine the value of an instrument (mark-to-market or mark-to-model) as a function of pricing parameters or to determine the change in the value of an instrument as a function of risk factors. The latter kind of pricing model may be simpler than the former. A pricing model may be the combination of several calculations; for example a first valuation technique to compute a price, followed by valuation adjustments for risks that are not incorporated in the first step.

Primary risk class: A set of trading desks that are exposed to largely similar primary risk factors.

Primary risk factor: The risk factor which is most important for a specific instrument.

Profit and loss (P&L) attribution: A backtesting method for assessing the robustness of banks' risk management models by comparing the hypothetical P&L predicted by risk management models with the actual P&L.

"Real" prices: A criterion for assessing whether risk factors will be amendable to modelling. A price will be considered "real" if: it is a price from an actual transaction conducted by the bank; it is a price from an actual transaction between other parties (eg at an exchange); or it is a price taken from a firm quote (ie a price at which the bank could transact).

Risk class: Either a primary risk class or a risk factor class depending on the method used to aggregate risk positions in the internal models-based approach. Across risk classes supervisory determined/restricted correlations have to be used to determine regulatory capital.

Risk factor: A principal determinant of the change in value of a transaction that is used for the quantification of risk. Risk positions are modelled by risk factors.

Risk factor class: (Component) Risk factors are mapped to the risk factor classes equity, credit, interest rate, commodities and FX.

Risk position: A risk position is a conceptual construct that represents a particular aspect of risk associated with a transaction within a market risk model or a standardised approach for market risk. Example: A bond denominated in a currency different to a bank's reporting currency may be mapped to a risk position for FX risk, a number of risk positions for interest rate risk (in the foreign currency) and one or more risk positions for credit risk.

"Risk-theoretical" P&L: The daily desk-level ~~(hypothetical)~~ P&L that is predicted by the risk management model conditional on a realisation of all relevant risk factors that enter the model.

Trading desk: A separately managed business line within a bank that follows defined trading strategies with certain instruments, with the goal of generating revenues or maintaining market presence while ~~from~~ assuming and managing risk.

Surcharge (in the context of the <u>sStandardised</u>~~MM~~/internal models-based approach relationship): A

Pillar 1 capital charge (calculated as a percentage of the SMM capital charges) required in addition to the capital charge under the internal models-based approach.

Interest rate risk in the banking book: The exposure of a bank's financial condition to adverse movements in interest rates stemming from banking book assets and liabilities.