Basel Committee
on Banking Supervision

Consultative Document

Fundamental review of the trading book: outstanding issues

Issued for comment by 20 February 2015

December 2014

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

ISBN 978-92-9197-022-3 (print)

ISBN 978-92-9197-021-6 (online)

Contents

Fundamental review of the trading book: outstanding issues

Background and summary

This is the Basel Committee's third consultative paper on outstanding issues related to the fundamental review of trading book capital requirements.[1] As with the two previous consultative papers, the revisions to the capital framework set out in this paper aim to contribute to a more resilient banking sector by strengthening capital standards for market risk. They form part of the Committee's broader agenda to reform regulatory standards for banks in response to the financial crisis. The revisions in this paper continue to reflect the Committee's focus on achieving a regulatory framework that can be implemented consistently by supervisors across jurisdictions.

Since the publication of the second consultative paper in October 2013, the Committee has undertaken a trading book hypothetical portfolio exercise to assess the proposed internal models-based approach for market risk in the first half of 2014,[2] and a Quantitative Impact Study (QIS) on the proposed market risk framework in the second half of 2014.[3] Comments received on the second consultative paper have also been carefully reviewed by the Basel Committee.

Recognising the significant operational burden posed by certain features of the proposed framework, including the revised standardised approach, several alternative treatments to those set out in the second consultative paper were tested in the 2014 QIS and will be further assessed through a follow-up QIS in early 2015. In addition, feedback received on the revised trading book/banking book boundary included questions on whether internal risk transfers from the banking book to the trading book would be recognised for regulatory capital purposes.

This document sets out the Committee-agreed refinements made to the proposed market risk framework since October 2013. In particular, it includes new proposals in specific areas:

(i) the treatment of internal risk transfers of equity risk and interest rate risk between the banking book and the trading book, to supplement the existing treatment of internal transfers of credit risk (Section 1);

(ii) a sensitivities-based methodology in the revised standardised approach (Section 2); and

(iii) a simpler method for incorporating the concept of liquidity horizons in the internal models approach (Section 3).

These changes are in addition to the technical refinements and clarifications to the revised internal models-based approach and the revised boundary which have been reflected in the frequently

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

[2] Basel Committee on Banking Supervision, *Analysis of the trading book hypothetical portfolio exercise*, September 2014, www.bis.org/publ/bcbs288.pdf.

[3] Basel Committee on Banking Supervision, *Instructions for Basel III monitoring*, July 2014, www.bis.org/bcbs/qis/biiiimplmoninstr_jul14.pdf. Instructions for the trading book QIS are described in Section 7 and Annex 3.

asked questions (FAQ) document accompanying the 2014 QIS.[4] For the follow-up QIS in early 2015, an updated version of the full draft Accord text on the revised market risk framework will be published as a reference document, incorporating the changes made via the FAQ process and the proposals set out in this consultation paper.

Q1. What are your views on the specific refinements described in the three sections of this consultative document?

Q2. Do these specific proposals strike the right balance between simplicity, comparability and risk sensitivity?

Next steps

The Committee welcomes comments from the public on the specific refinements described in this document by **Friday 20 February 2014**. All comments will be published on the Bank for International Settlements website unless a respondent specifically requests confidential treatment. In parallel, the Committee will initiate a follow-up QIS in early 2015 to inform deliberations on the final calibration of the new framework for the trading book capital standard.

Once the Committee has reviewed responses and results of the QIS, it intends to publish the final revised Accord text within an appropriate time frame. Ahead of this publication, implementation arrangements for the revised standards (including the timetable) will be discussed by the Basel Committee, taking into account the range of other reforms that have been, or are due to be, agreed by the Committee.

4 Basel Committee on Banking Supervision, *Frequently asked questions on Basel III monitoring*, September 2014, www.bis.org/bcbs/qis/biiiimplmonifaq_sep14.pdf.

1. Internal risk transfers between the banking book and the trading book

In October 2013, the Committee put forward for consideration a revised regulatory boundary between the trading book and banking book. This revised boundary retains the link between the regulatory trading book and the set of instruments that banks are deemed to hold for trading purposes, but also seeks to reduce the possibility of arbitrage and deliver a more consistent implementation of the boundary across banks – by introducing more tools to improve the supervision of the boundary and imposing stricter limits on the switching of instruments between the two regulatory books.

Several responses to the second consultative paper requested clarification of the treatment for internal risk transfers. Banks frequently hedge risk positions in their banking book by entering into derivative trades with external counterparties. These external hedges are commonly executed in two steps: an internal derivative trade with the trading book (commonly referred to as internal risk transfer), followed by an offsetting derivative trade executed by the trading book with the external party. A number of such hedges are recognised in the Basel capital framework as risk mitigants (ie eligible third-party protection) of banking book positions for regulatory capital purposes.[5]

The Committee acknowledges the merits of allowing banks to efficiently hedge risks in their banking books, without doing so in a way that would compromise the banking book/trading book boundary. Internal risk transfers (IRTs) allow banks to focus their derivative hedging activity in the trading book, which may be better positioned to execute trades efficiently, as well as to monitor counterparty limits, contributing to better risk management of the bank. At the same time, IRTs, if not appropriately constrained, could provide banks with a mechanism to shift risk between the banking book and trading book so as to take advantage of lower capital requirements in one or the other, creating incentives for capital arbitrage.

Against that backdrop, the Committee is aiming to develop a treatment for internal risk transfers (from the banking book to the trading book) of credit, equity and general interest rate risk under the revised market risk framework which balances the need for effective risk management against concerns that such internal risk transfers could compromise the revised boundary. There will be no regulatory capital recognition for internal risk transfers from the trading book to the banking book.

[5] See Basel Committee on Banking Supervision, *Basel II: International Convergence of Capital Management and Capital Standards: A revised framework – comprehensive version*, June 2006, www.bis.org/publ/bcbs128.pdf. Paragraph 689(i) states:

"When a bank hedges a banking book credit risk exposure using a credit derivative booked in its trading book (ie using an internal hedge), 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 the requirements of paragraph 191 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 external credit derivative hedge would be included in the trading book for regulatory capital purposes."

1.1 Internal risk transfers of credit and equity risk

The Committee affirmed the treatment for internal risk transfers of credit risk as set out in the second consultative paper and is of the view that this "pass-through" approach should be extended to the treatment for internal risk transfers of equity risk from the banking book to the trading book.

Under this approach, the internal risk transfer would be recognised as a risk mitigant for a credit or equity risk position in the banking book, if the trading book engages in a derivative transaction with an external counterparty that is an exact match of such internal risk transfer and the external transaction is of a type which would be recognised as a risk mitigant if entered into directly by the banking book. The capital benefit for the internal risk transfer is recognised in the banking book and there is no market risk capital requirement for the internal risk transfer or the external re-hedge in the trading book. The capital treatment is identical to the situation where the credit or equity risk is hedged directly in the banking book. There is no shifting of risk from the banking book to the trading book, with the latter effectively acting only as an agent for the banking book for the external re-hedge.

1.2 Internal risk transfers of interest rate risk

The Committee recognises the layered nature of general interest rate risk (GIRR) and is consulting on two options for the treatment of IRTs for GIRR.

Option 1 would use a treatment similar to that for internal risk transfers of credit and equity risk for IRTs of GIRR. The internal risk transfer would be recognised as a risk mitigant for a GIRR position in the banking book if the trading book engages in a derivative transaction with an external counterparty that is an exact match of such internal risk transfer and the external transaction is of a type which would be recognised as a mitigant if entered into directly by the banking book. Consistent with this treatment, the capital benefit for the internal risk transfer is recognised in the banking book and there is no market risk capital requirement for the internal risk transfer or the external re-hedge in the trading book. This treatment is set out in Box 1, paragraph 38 (c), as **[GIRR: Option 1]**.

Option 2 would allow the shifting of risk from the banking book to the trading book with strict constraints to minimise incentives for capital arbitrage. This approach satisfies the following criteria sought by the Committee: (a) the benefits for risk management outweigh concerns about boundary arbitrage; (b) the internal risk transfers and external hedges of those transfers cannot be used to offset interest rate risk arising from trading book activities; (c) the GIRR transferred to the trading book is properly captured by the market risk framework; (d) the treatment is consistent with the principles in the banking book for treatment of GIRR; and (e) supervisors are able to track and monitor the internal risk transfers and their impact on risk and capital. This treatment is set out in Box 1, paragraph 38 (c), as **[GIRR: Option 2]**.

Box 1: Illustrative amendment of draft revised standards set out on page 55 of the *Fundamental review of the trading book – second consultative document* [1]

6. Treatment of ~~hedges~~internal risk transfers[2]

[38.] 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.

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

(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-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:

- o the internal risk transfer is documented with respect to the banking book interest rate risk being hedged and the sources of such risk;
- o the internal risk transfer is conducted with trading desks which have been specifically approved by the supervisor for this purpose; and
- o it is a recognised type of hedge for a banking book interest rate risk exposure.

- o 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.

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

[41.] 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.[3]

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

[2] 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.

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

1.3 Way forward

The Committee invites feedback on the proposed treatment of internal risk transfers of equity risk, and the two options set out for internal risk transfers of GIRR. Importantly, the Committee will aim towards compatibility between the prospective treatment of internal risk transfers of GIRR and the capital treatment of interest rate risk in the banking book.

2. The revised standardised approach for market risk

In the second consultative paper, the Committee outlined three main objectives for the revised standardised approach. First, the approach must provide a method for calculating capital requirements for banks with a level of trading activity that does not require sophisticated measurement of market risk. Second, it provides a fallback in the event that a bank's internal model is deemed inadequate, including the potential use as an add-on or floor to an internal models-based charge. Finally, the approach should facilitate consistent and comparable reporting of market risk across banks and jurisdictions. Given that the Committee has agreed that no modelling of securitisations will be permitted, the revised standardised approach will also have to capture the pertinent risks from securitisations.

The second consultative paper proposed a cash flow-based method which required banks to decompose financial instruments into their constituent cash flows and then discount each cash flow using the risk-free curve for each currency plus the credit spread of each instrument. These discounted cash flows were to be used as inputs into the treatments of GIRR, credit spread risk (CSR) and foreign exchange (FX) risk in the revised standardised framework.

Industry respondents raised a number of concerns with the cash flow-based method:

- Bank systems currently use cash flows to price trades, but do not store or export these cash flows to existing risk management systems. It will be costly for banks to build parallel systems, and the process will take a significant amount of time.

- The approach requires that a separate discount curve (incorporating a risk-free rate plus credit spread) be constructed for each instrument. These new curves will incorporate bank-specific choices and assumptions. Constructing possibly thousands of curves will be burdensome for banks and difficult to validate on an ongoing basis.

Following on from these concerns, the Committee is agreeable to a **sensitivity-based approach (SBA)** as an alternative to cash flow-based calculations for the standardised approach. This new method would require banks to use price and rate sensitivities that are more likely to be available in their systems as inputs into the different asset class treatments. The use of sensitivities thus reduces the implementation cost of the revised standardised approach.

A sensitivity-based approach entails reliance on the pricing models of firms. This may improve the risk sensitivity of the standardised approach, but comes at a cost to simplicity and consistency. However, recognising the industry concerns above to be valid, the Committee views the cash flow-based method as even more complex and impractical to design or compute by comparison, without offering any clear advantages in terms of risk capture or comparability. Specifically, the technical challenges involved in prescribing the cash flows of complex instruments were prohibitive in terms of enhancing the proposed standardised approach as a functional fallback to the internal models-based approach. The Committee has therefore decided to proceed with the SBA for the revised standardised approach, and discontinue further work on the cash flow-based method.

This section broadly focuses on providing clarifications on how the revised (sensitivity-based) standardised approach would capture more granular or complex risk factors across different asset classes in the trading book. It builds on the standardised framework tested in the trading book QIS conducted in the second half of 2014.[6] Annex 1 sets out an updated draft Accord text for the revised standardised approach. Given the significant changes to the framework which was presented in the second consultative paper, the updated Accord text is not presented in tracked-change format.

For the follow-up QIS in early 2015, an updated version of the full draft Accord text on the revised market risk framework will be published as a reference document, incorporating the changes made via the FAQ process and the proposals set out in this paper on the revised standardised approach.

2.1 Key features of the revised standardised approach

The structure of the proposed standardised approach in the second consultative paper has largely been retained in the framework set out in Annex 1 of this paper. The proposed framework captures the delta and optionality (ie non-delta) risk components of GIRR, CSR of non-securitisation and securitisation exposures, equity risk, commodity risk and FX risk. Separate requirements are proposed for the default risk of non-securitisation and securitisation exposures.

Capital charges continue to be computed at an asset class level, with no recognition of diversification effects across different asset classes. As mentioned in the second consultative paper, diversification will be recognised to a much greater extent within each asset class in the revised standardised approach. While this represents a convergence with the internal models-based approach in

[6] Basel Committee on Banking Supervision, *Instructions for Basel III monitoring*, July 2014, www.bis.org/bcbs/qis/biiiimplmoninstr_jul14.pdf. Instructions for the trading book QIS are described in Section 7 and Annex 3.

terms of risk sensitivity, it also raises the question of how the resultant basis risk can be captured in a consistent and comparable manner within a standardised framework (see Section 2.2).

On the treatment of optionality, the Committee is aiming for a more consistent approach across all asset classes (aside from default risk) for instruments in the trading book that are options, or include an embedded option. Consistent with the current standardised approach, a treatment for vega risk (which measures the sensitivity of the value of an option with respect to a change in volatility) and curvature risk (which measures the rate of change of delta) is under development (see Section 2.3-2.5).

In order to enhance the clarity of the proposed delta risk treatments, the Committee has adopted a simpler presentation of the draft Accord text – beginning with a formulaic description of the parametric expected shortfall (ES) calculation, followed by the definitions of the risk factors for each asset class and instrument-level sensitivities to these risk factors. Risk weights and correlations for each asset class are then prescribed. The updated draft Accord text in Annex 1 incorporates several refinements to the definition of risk factors and calibration of certain risk weights (see Section 2.6-2.8).

Finally, the Committee has decided to set out updated draft Accord text on the particular treatment of the correlation trading portfolio within the default risk and CSR frameworks for securitisation exposures (see Section 2.9).

2.2 Treatment of basis risk

2.2.1 Policy direction

The treatment of basis risk (eg the risk that the relationship between the prices of correlated instruments weakens over time) is of material importance to both the standardised and internal model approaches for market risk. Various bases (such as the basis between overnight index swap (OIS) and bank-offered rate (BOR) curves, or that between bond and CDS curves, frequently caused severe losses by banks during adverse periods of stress.

The baseline method by which the Committee intends to capture basis risk is through the definition of a **basis risk correlation parameter** ("the correlation method"). This parameter would be set at [0.1%], which replaces the [90%] disallowance factor as previously specified in the second consultative paper.[7] The departure from the "disallowance factor method" was motivated by early QIS findings which showed that such a method would make the standardised capital charges notionally dependent and insufficiently risk-sensitive, in particular for interest rate and FX risks.

The correlation method does, however, have two limitations:

- In order to ensure conservative capital outcomes, banks must be able to compute sensitivities to all the regulatory-specified risk factors, which might not be feasible for less sophisticated trading banks.
- A consistent application across banks of the determination of sensitivities to some regulatory risk factors is still being assessed and may lead to an underestimation of risks in some instances.

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

As a consequence, the Committee is keeping open the possibility of requiring the application of the disallowance factor method under two conditions:

- The final standard may allow for the use of the disallowance factor method, as long as a bank is able to demonstrate that it has small-scale trading activities. In this regard, a reduced set of risk factors specific to the disallowance factor method will be developed and tested in a QIS in due course.
- If deemed legitimate in the course of the finalisation of the calibration of the standardised approach, the disallowance factor method might be introduced for some risk factors, in addition to the correlation method.

2.2.2 Numerical illustrations

The following is a description and comparison of the two methods.

- *The disallowance factor method* consists in applying a disallowance factor between a sum of gross positive and a sum of gross negative sensitivities to a specified set of risk factors – The smaller in magnitude of these summed sensitivities is multiplied by a 0.95 disallowance factor.[8] While disallowance factors may be relevant for capturing basis risk on average (ie on average, most internationally-active banks would have both positive and negative sensitivities to various risk factors), there are conceptual limitations to this treatment. Specifically, disallowance factors would apply to two sensitivities from the same risk factor as long as they are of opposite sign, regardless of whether there is basis risk between two such risk factors.
- *The correlation method* consists in applying a correlation parameter between sensitivities to various risk factors where basis risk is detected. For example, in the case of GIRR, risk exposures are defined by the sensitivity of an instrument to changes in the market value of the relevant yield curve (in which the instrument is demoninated) at ten specified tenors, to reflect the granularity of the risks. For each yield curve, a "10 by 10" inter-tenor correlation matrix would be constructed. Under the assumption that a bank uses five curves for a given currency (eg one OIS curve plus four BOR curves), the correlation matrix would increase by a magnitude of 5, ie a "50 by 50" correlation matrix would be constructed. This would still be computationally manageable for most banks.

  See Box 2 for a detailed, illustrative comparison between the disallowance method and the correlation method.

[8] Basel Committee on Banking Supervision, *Instructions for Basel III monitoring*, July 2014, www.bis.org/bcbs/qis/biiiimplmoninstr_jul14.pdf. Instructions for the trading book QIS included a test of a 0.95 disallowance factor in the proposed SBA for the standardised approach.

Box 2: Numerical illustration to compare the use of disallowance factors with correlation parameters for capturing basis risk

The numbers used in the following examples do not represent true scenarios and are for pedagogical purposes only.

Suppose a bank has a total of two instruments with GIRR exposure, each having three sensitivities to two different curves (OIS and BOR) at each of the tenors: one year, two years and three years. The GIRR sensitivities are defined in the following table:

Instrument 1	*1Y*	*2Y*	*3Y*
OIS	1	10	2
BOR	2	1	5

Instrument 2	*1Y*	*2Y*	*3Y*
OIS	1	–15	–3
BOR	3	2	5

Under the disallowance factor method, the bank would have computed the net sensitivity by summing the gross positive and gross negative sensitivities for each tenor and applied a 0.95 disallowance factor to the smaller of the two gross sensitivities (positive or negative):

	1Y	*2Y*	*3Y*
Net sensitivity	1 + 2 + 1 + 3 = 7	–15 + .95 * (10 + 1 + 2) = –2.65	(2 + 5 + 5) – .95 * 3 = 9.15

The risk weights relevant for each bucket (defined in paragraph 29, Annex 1) are then applied to the net sensitivities, to derive risk-weighted sensitivities. The two inter-tenor correlation matrices (defined in paragraph 32-33, Annex 1) are then used in the determination of aggregate risk-weighted sensitivities within each bucket, which in turn are used to derive the capital charge across buckets within each asset class (using the formula in paragraph 8(d), Annex 1). <u>In this first example, the GIRR capital charge = 1,736</u>.

Under the correlation method, the bank first computes its aggregate sensitivity to each tenor, by simple summations (as no basis risk is recognised between two sensitivities to the same curve, same tenor). It derives the following table, which represents the "aggregate sensitivities to each risk factor":

OIS	1 + 1 = 2	10 – 15 = –5	2–3 = –1
BOR	2 + 3 = 5	1 + 2 = 3	5 + 5 = 10

The bank would then apply the risk weights to the "aggregate sensitivities to each risk factor" table, in order to derive the following table of risk-weighted sensitivities:

OIS	300	–625	–115
BOR	750	375	1,150

The bank then applies a correlation matrix constructed based on the two inter-tenor correlation matrices (depending on the same signs or different signs of the sensitivities), scaled by either the (1 + *x*) correlation shift for same signs or (1 – *x*) correlation shift for different signs. Correlations are capped at 1.

			1Y	*2Y*	*3Y*	*1Y*	*2Y*	*3Y*
			OIS	OIS	OIS	*BOR*	*BOR*	*BOR*
			300	–625	–115	750	375	1,150
1Y	OIS	300		80%	75%	**100.0%**	*90.1%*	*85.1%*
2Y	OIS	–625			95%	*79.9%*	**99.9%**	*89.9%*
3Y	OIS	–115				*74.9%*	*89.9%*	**99.9%**
1Y	*BOR*	750					90%	85%
2Y	*BOR*	375						95%
3Y	*BOR*	1,150						

The figures in **bold** are cases where either the cap (100.0% correlation) applies (ie for same-sign sensitivities) or the (1 – *x*) scalar (99.9% correlation) applies (ie for different signs sensitivities).

The figures in *italics* are cases when a correlation is determined from the two inter-tenor correlation matrices, and then the basis correlation parameter is applied (namely, when two sensitivities have the same currency by different tenors and different curves).

For instance, the correlation between sensitivities –625 to OIS–2Y and +750 to BOR–1Y is 80% * (1 – [0.1%]) = 79.9%. As another example, the correlation between sensitivities +300 to OIS–1Y and +375 to BOR–2Y is 90% * (1 + [0.1%]) = 90.1%.

After applying this correlation table to determine the aggregated risk-weighted sensitivities within each bucket, the capital charge across buckets within each asset class can be derived. In this second example, the GIRR capital charge = 1,832.

Conclusion

This example illustrates a simple case where a bank has only two instruments and two curves within one currency. In general, an internationally active bank would have many more instruments and possibly several curves within one currency. As the number of instruments do not affect the size of the above correlation matrix, a bank which has 10 curves within a currency would not result in correlation matrices constructed with more than 10 tenors * 10 curves by 10 tenors * 10 curves, ie 100 rows by 100 columns within an asset class (eg GIRR). This should still be computationally manageable for most internationally active banks.

2.3 Treatment of optionality: vega and curvature risk

The Committee has considered the merits of either enhancing the "scenario approach" to the non-delta treatment of options, or adapting the "delta plus method"[9] to the revised standardised framework. The method outlined in the draft Accord text within the second consultative paper was an enhanced version of the current "scenario approach", while the "enhanced delta plus method" was set out in the standardised framework tested in the trading book QIS conducted in the second half of 2014.[10] The instructions for this QIS included specifications related to vega and curvature risk.

In analysing various means to adapt scenario specifications in order to improve consistency of risk capture, the Committee encountered challenges with achieving a desirable level of coherence with the broader standardised approach methodology. The Committee has therefore decided to consult on an alternative "enhanced delta plus method" based on two components, one for curvature risk and another for vega risk. The main advantage of the "enhanced delta plus method" is that it would allow banks to leverage on the risk weights and bucketing structure already specified in the delta risk standards, thereby achieving a more consistent and intuitive approach.

Specific issues with respect to curvature and vega risk capture are outlined below.

[9] As described in paragraphs 718 (Lix–Lxi) of Basel Committee on Banking Supervision, *International Convergence of Capital Measurement and Capital Standards – A Revised Framework Comprehensive Version*, June 2006.

[10] Basel Committee on Banking Supervision, *Instructions for Basel III monitoring*, July 2014, www.bis.org/bcbs/qis/biiiimplmoninstr_jul14.pdf. Instructions for the trading book QIS are described in Section 7 and Annex 3.

2.4 Treatment of vega risk

The Committee is of the view that vega risk is mainly a linear risk and that some hedging strategies consist in partially hedging volatility risk with spot positions. Consequently, the Committee is considering the merits of treating vega risk together with delta risk, whereby vega risk positions would be inputted in the same buckets as for delta risk instruments.

The Committee acknowledges the following two areas of further work towards finalisation of the vega risk framework:

- The Committee will consider further analysis of the use of the disallowance factor method or the correlation method for capturing basis risk. In this paper, the Committee is exploring the appropriateness of defining more granular vega risk factors which would be needed to ensure prudence under the correlation method (eg ATM volatility matrix and/or cube) while ensuring homogeneous computations of sensitivities across banks (an example of a risk factor which could increase variability is the moneyness of an option, ie smile risk).
- Further calibration work is needed with respect to volatility risk weights, spot-volatility correlation and volatility-volatility correlation.

2.4.1 Scalar in the vega risk formula

The Committee intends to apply a relative weight of [0.55] for implied volatility risk. In order to ensure that capital is in line with the granularity at which liquidity horizons were specified for internal models, the Committee also is exploring the appropriateness of applying a simple scaling rule from the 10-day liquidity horizon used for calibration to the appropriate horizon LH:

$$\text{relative risk weight} = 0.55 \cdot \sqrt{LH/10}$$

where the liquidity horizon LH to be used is defined per risk factor in the following table:

Risk factor category	*LH*
Interest rate ATM volatility	60
Credit (other)	250
Equity price (large cap) volatility	20
Equity price (small cap) volatility	120
FX volatility	60
Energy price volatility	60
Precious metal price volatility	60
Other commodities price volatility	120

The areas in the draft Accord text in Annex 1 which addresses vega risk are set out in square brackets, indicating that these issues remain open for further consideration and analysis by the Committee.

2.5 Treatment of curvature risk

2.5.1 Modelling issues due to large negative shocks

During the QIS, some banks expressed concerns that employing 100 bp absolute shocks at singular tenor points within the capital treatment of curvature risk (CVR_k) can lead to unusual outcomes (eg negative forward rates, negative variance). For currency areas where interest rates remain low, such a shift in one vertex spot rate up can result in a dramatic spike in the forward rate for that period, followed by a dramatic swing back in the other direction. Conversely, other banks have provided feedback that they are already adapting their systems to ensure that they can cope with such events occurring (albeit with possibly unrealistic shocks incorporated into the shape of the yield curve).

Several alternative solutions have been considered by the Committee, each with its own limitations. For instance, capping the shocks would lead to varying risk weights across jurisdictions. Requiring parallel shifts represents a deviation from the definition of the delta risk factors (which is at tenor level), although it offers a good approximation for capturing curvature risks.

As a consequence, balancing the pros and cons, the Committee has decided to require parallel shifts for GIRR (interest rate and inflation) and CSR - all the tenors of a given yield curve should be shifted once, each tenor by the maximum delta risk weight. The deltas to be subtracted from the curvature risk position are all the weighted sensitivities capitalised in the delta framework. This is a derivation under a normality assumption between the two underlying risk factors.

For GIRR and CSR, the term structure correlations will not apply (a correlation of 1 between buckets is implicitly assumed). The other correlations (basis correlation parameter and cross-currency/cross-names) will be defined as the square of the correlations used in the delta risk framework. This is also a derivation under the normality assumption.

2.5.2 Improving scenario consistency

In the version of the draft Accord text used for the QIS conducted in the second half of 2014, the standardised approach required the computation of CVR_k at instrument level. The result was extremely conservative capital charges even for cases of perfect offsetting positions.[11]

To address this problem, the Committee is considering the feasibility of computing CVR_k at the bucket level (ie across all the instruments subject to optionality). This is reflected in the CVR_k formula in paragraph [10] of the draft Accord text in Annex 1.

2.6 Risk factor definitions

2.6.1 Illustrations of how risk factors should be defined

Risk factors are defined in paragraphs [11–18] of the draft Accord text. The purpose of this subsection is to illustrate what is intended by these paragraphs in practice.

- For general interest rate risk, delta risk factors are defined along the two dimensions {yield curve; regulatory tenor}. For instance, for the euro, a risk factor can be {EONIA; 10Y}; for the US dollar, it can be {LIBOR 3M; 5Y}.
- For credit spread risk, delta risk factors are also defined along the two dimensions {credit spread curve; regulatory tenor}. For instance, for a given issuer, eg IBM, a risk factor can be {IBM bond curve; 5Y}, while another can be {IBM CDS curve; 3Y}.
- For equity risk, delta risk factors are defined along one dimension {equity exposure}. For instance, risk factors can be {IBM spot equity}, {IBM dividend forecasts} or {IBM spot repo}.

[11] For example, consider a bank that hedges an option requested by a client, with an almost perfectly offsetting trade with a hedge provider. Under the previous treatment the trading book would be presented with two perfectly offsetting option positions with opposite deltas, curvatures and vegas. CVR_k would be non-zero given that a portion of the two curvature risk positions is computed on the option and its hedge.

- For commodity risk, delta risk factors are defined along three dimensions {spot commodity price; commodity grade; location}. For instance, risk factors can be {crude oil; Brent; Singapore} or {crude oil; WTI; Rotterdam}.
- For FX risk, delta risk factors are defined along one dimension {the exchange rate foreign currency against domestic currency}. For instance, risk factors can be {the exchange rate JPY/USD} for a US bank having an exposure in yen and {the exchange rate BRL/EUR} for a Brazilian bank having an exposure in euros.

2.6.2 Treatment of foreign exchange risk

In the treatment of FX risk outlined in the second consultative paper (paragraph 140), cash flows denominated in a foreign currency were allocated to three maturity bands (below one year, between one and three years, and over three years). Considering the merits of simplification, the QIS has been conducted based on only one maturity band. Yet, in order to address concerns regarding the capitalisation of cross-currency swaps (when notional is exchanged at inception date and at maturity date), the Committee has decided to retain the three-maturity band structure for this type of instrument.

2.6.3 Definition of the inflation risk factor for general interest rate risk

The Committee acknowledges the importance of a risk-sensitive treatment of inflation instruments within GIRR. The draft Accord text clarifies that the retained treatment disentangles the general interest rate risk and the inflation risk arising from the inflation instrument. This is in order to ensure a consistent treatment between GIRR and inflation risk factors.

2.7 Calibration of the approach

2.7.1 Liquidity horizons and risk weights

For consistency between the internal models-based and standardised approaches, several risk weights were calibrated and buckets were defined in order to reflect the length of the liquidity horizons. For example, bucketing reflects the dimensions along which liquidity horizons vary, such as market capitalisation for equities, liquidity of currency pairs for FX, liquidity of interest rates, and investment quality for credit. Moreover, risk weights were conservatively calibrated as stressed ES 97.5% from the distribution of absolute and relative changes in risk factors using overlapping long horizons.

2.7.2 Definition of the buckets

While the bucketing structure did not change from the second consultative paper with the exception of the inclusion of inflation in the GIRR and treatment of CSR for the correlation trading portfolios, work has been conducted to further elaborate on the definitions of the buckets.

2.8 Treatment of indices

The Committee has decided that indices should be treated based on a "look-through" approach. Namely, any index should be decomposed into its constituents, and sensitivities to those constituents should be computed. In order to reflect the basis risk between a long position on an index and a short position on all the constituents of the index, the basis risk correlation should apply between the sensitivities to an index's constituent and the sensitivities to the constituent itself. A conservative fall-back, which can be applied when the "look-through" is not feasible, is also specified in the draft Accord text.

2.9 Treatment of the correlation trading portfolio (CTP)

2.9.1 Treatment of the credit spread risk of the CTP

The second consultation paper specified a separate credit spread risk treatment for securitisation exposures and designed the risk weighting procedure based on tranche characteristics such as maturity, attachment and detachment.

Once the standardised approach used sensitivities rather than cash flows as inputs, the Committee considered that a look-through approach could be implemented and the treatment of credit spread with non-securitisations could be aligned as it facilitated the incorporation of hedges.

The treatment for the correlation trading portfolio and its hedges has an added degree of conservativeness. The Committee has increased the basis risk correlation parameter to capture the basis risk between tranched instruments in the correlation trading portfolio and single names – for example, increased bid-ask spreads on single names that would lead to an increase in the marking-down of tranches.

Finally, the Committee has recalibrated the credit spread risk weights to reflect a longer liquidity horizon of one year. Such positions became illiquid in the recent crisis due to higher upfront payments and decreased demand owing to the complexity of such securitised products.

2.9.2 Treatment of the default risk of the CTP

In the second consultative paper, the Committee had already incorporated some specificities of the correlation trading portfolio into the default risk framework (securitisations), where the treatment applies the default risk (non-securitisations) approach, adapting it to portfolios which mostly contain positions on indices and tranches of indices. Namely, the first step is the offsetting of long and short positions in like exposures under some conditions. The draft Accord text gives the details of such offsetting criteria following a principle of replication and decomposition. For instance, a long position in a 10–15% tranche vs combined short positions in 10–12% and 12–15% tranches on the same index/series should be offset against each other. Where positions are not replications of each other, however, offsetting is not allowed; thus a long position in the iTraxx 0–3% and a short position in the iTraxx 9–12% cannot be offset.

The next steps (net short and net long positions, default risk weighting, hedging benefit discounting) are similar to the applicable steps under the non-securitisation default charge.

The default treatment for the CTP will be aligned with proposed revisions to the securitisation framework for the banking book. Specifically, the risk weights used for capturing default risk within trading book securitisation exposures will be determined largely by the banking book treatment. The Committee's intention here is to provide a partial hedge benefit recognition for shorts and avoid double-counting of migration risk due to a CSR charge.

In the revised securitisation framework for the banking book,[12] the Committee is of the view that the most appropriate approach to capitalise default for CTPs is based on the internal ratings-based approach, since it is the most accurate in using information on each exposure in the underlying pool. Specifically, the Committee intends to adopt the Simplified Supervisory Formula Approach (SSFA) that

[12] Basel Committee on Banking Supervision, *Revisions to the Securitisation Framework*, December 2014, www.bis.org/bcbs/publ/d303.htm

uses, among other risk factors, expected losses, ie KIRB. Further, to avoid double-counting of migration risk, the maturity parameter will be capped at one year. A reduction in the credit spread capital charge will be adopted for defaulted names to avoid double-counting of the risk of losses from credit spread shocks and default losses.

2.10 The way forward

[Section 4] of the draft Accord text on "Sensitivity validation standards" will be incorporated in due course. It will set some criteria to be used by supervisors in order to validate sensitivity computations, which includes a validation of the choice of risk factors. The Committee is exploring several possibilities as to how such a validation process and criteria can be applied.

3. Incorporating the risk of market illiquidity in the internal models approach

In the second consultative paper, the proposed internal models approach for market risk reflected the relative liquidity of risk factors and the risk of market illiquidity. The approach to address the risks posed by varying market liquidity consisted of two elements which are generally retained in the revised proposals, with some modifications:

- First, incorporating "liquidity horizons" in the market risk metric, defined as "the time required to execute transactions that extinguish an exposure to a risk factor, without moving the price of the hedging instruments, in stressed market conditions". As in the second consultative paper, risk factors will be assigned five liquidity horizon categories, ranging from 10 days to one year. To ensure consistency in capital outcomes, and in balancing the trade-off between simplicity and risk sensitivity, the Committee assigned liquidity horizons at the level of broad categories of risk factors. This regulatory assessment of liquidity has also been incorporated in the calibration of the standardised approach. In the revised approach described in this section, the method used to calculate expected shortfall (ES) with varying liquidity horizons has been modified to address practical issues identified in consultation feedback received on the construction of internal models with varying liquidity horizons. In addition, the length of the liquidity horizon for exchange rate risk and interest rate risk has been modified.
- Second, the introduction of an additional risk assessment tool for desks. This will not depend on internal models, reflecting the Committee's concerns around excessive reliance on market risk models that use historical price volatility to deliver capital charges. The assessment will seek to identify desks that trade particularly illiquid, complex products and to form part of the requirements for allowing model permission for these desks. This feature is retained in the revised proposal, with the assessment details to be determined in the calibration phase.

3.1 Issues identified from consultation feedback

3.1.1 Actual versus scaled liquidity horizons

In the approach set out in the second consultative paper to capitalising market risk over longer and varying liquidity horizons, the ES model was required to model the risk factor shocks over the actual length of a given horizon without approximations or scaling from shorter horizons. For instance, under a 60-day liquidity horizon shock, the volatility input in the ES model would need to be volatilities calculated from 60-day changes in the risk factor, and the profit and loss (P&L) impact of risk factor shocks in the model would need to be the P&L of a 60-day change in the risk factor (ie without scaling from a shorter-horizon P&L estimate).

The comments received on this treatment for ES models with varying liquidity horizons pointed to a number of potential implementation problems:

- Potential for lack of comparability across firms because of the greater complexity of models' varying liquidity horizons.
- The approach would provide only a relatively small benefit in terms of greater precision compared with modelling alternatives and relative to the cost of building such models:
  - Implementing the new modelling approach would be a significant cost requiring new data sets, new models and validation of the new systems.
  - Rebuilding pricing grids, need for full revaluation instead of deltas/gammas for large long-horizon shocks.
  - Back-filling of data series or use of proxies would be required for missing data for the longer horizons, and data infrastructure would need revalidation of new data sets.
  - Re-estimating factor models along with validation of the new models.
  - Existing models cannot accommodate risk factor shocks across large differences in horizons.
  - The time frame for implementation is too short to implement and test complex model and system changes.
- As an alternative to the approach in the second consultative paper, the industry proposed a number of modelling approaches that would capture risk over varying liquidity horizons but at the same time be easier and less costly to implement. These suggestions relied on scaling of shorter-horizon risk measures from existing risk model infrastructure to the longer liquidity horizons.

3.1.2 Mismatches between two risk factors with different liquidity horizons

In the second consultative paper, the Committee had agreed to the definition of a liquidity horizon being "the time required to execute transactions that extinguish an exposure to a risk factor, without moving the price of the hedging instruments, in stressed market conditions". Accordingly, a liquidity horizon of three months would mean that the calculation of the regulatory capital charge for exposure to the risk factor would assume that, until the bank can hedge or exit its positions after three months, it would be exposed to the risk of price changes over the three-month period. While this approach is appropriate for capitalising exposure to the market liquidity risk of directional positions (eg long (unhedged) positions across different risk factors), the approach can result in an overestimate of risk for portfolios with a mix of long/short positions. Specifically, for mixed long/short positions in related risk factors with different liquidity horizons, the approach will have an investment horizon mismatch between the long/short positions in the capital calculation that does not actually exist. While such positions are exposed to basis and correlation risks, the application of different liquidity horizons to the risk factors capitalises the positions as if there were a maturity mismatch in the positions.

3.2 Revisions to the internal models approach with varying liquidity horizons

3.2.1 Scaled liquidity horizons

The Committee has made an assessment of the cost/benefit of alternative approaches and has adopted an approximation framework similar to the alternative approaches in the public comments. The revised approach to ES models with varying liquidity horizons employs an approximation based on scaling of ES calculated at a base horizon to the length of the longer liquidity horizons. The approach has the following features:

- It produces higher capital charges for less liquid risk factors, at levels that would not differ from the proposed approach in the second consultation paper.
- Quantitative analysis on the performance of this approach suggests that it is acceptably accurate and conservative.
- The approach has fewer features where firms could make different modelling choices and has the potential not to exacerbate the comparability problem across firms' model results.
- The approach is more aligned with existing model infrastructures that have been validated and tested and could reduce the cost and operational risk of implementing the new capital requirements.

3.2.2 Floored liquidity horizons between correlated risk factors

To address the problem of mismatches between two risk factors with different liquidity horizons, the Committee has agreed that the capital calculation for a trading desk can be applied with the specified liquidity horizons treated as a floor, but with the requirement that the basis/correlation risk in the portfolio be calculated over the length of the longer horizon. For example, in a trading desk with long/short positions of the same maturity, where the long positions are exposed to a risk factor with a 120-day horizon but short positions exposed to a risk factor with a 60-day horizon, the capital charge for the portfolio may be calculated with a 120-day horizon for all risk factors, subject to the condition that the risk estimate capitalises the trading desk's exposure to basis risk and correlation risk between the risk factors over the 120-day horizon (ie the longer horizon). If the bank wishes to use a longer liquidity horizon for a certain risk factor, it has to do so for the whole trading desk. Floored liquidity horizons between correlated risk factors are proposed in the draft Accord text in Box 3.

3.3 General features of the revised internal models approach with varying liquidity horizons

The revised ES model comprises an ES for a base horizon for all risk factors and a collection of incremental ES for subsets of risk factors with longer liquidity horizons, and the aggregation of these ES measures with an assumption that factor shocks are not correlated across liquidity horizons.

The collection of ES measures would entirely be calculated with respect to risk factor shocks over a base horizon (10 days), and each would be scaled to its corresponding longer liquidity horizon. The ES measures would comprise shocks to successive nested subsets of risk factors where each includes only those risk factors with liquidity horizons (LHs) longer than a certain length. For example, the first set of risk factors is the full collection of all risk factors, the second is the subset of risk factors whose LHs are 20 days or longer, and the third is the subset of risk factors whose LHs are 60 days or longer, and so on. In this approach, a firm could employ a single large ES model, and for each successive ES calculation turn off successively more risk factors in a progression corresponding to the subsets described above.

The ES of each of these nested subsets of risk factors would be scaled to the square root of the difference in horizon lengths of the successive subsets of risk factors. Finally, the collection of scaled ES measures would be aggregated using the square root of the sum of squares. The revised framework is reflected in the updated Accord text in Box 3.

Box 3: Illustrative amendment of draft revised standards set out on pages 85–87 of the *Fundamental review of the trading book - second consultative document*[1]

3. Quantitative standards

[181.] 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 is to be used.

(c) In calculating the expected shortfall, the liquidity horizons described in point (k) should be refe~~e~~lected 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, and the scaling to the liquidity horizon of a risk factor should be applied to this base horizon result as follows:

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

~~W~~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 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;
- $Q(p_i,j)_j$ 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, $Q(p_i,4)_4$ 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)).[2]

……

(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~~.~~:

- ~~B~~banks must map each risk factor on~~-~~to one of the risk factor categories shown ~~in (c)~~ below using consistent and clearly documented procedures;
- ~~T~~the mapping must be (i) set out in writing; (ii) validated by the ~~B~~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 (i~~.e.~~ the liquidity horizon specified below can be treated as a floor). Where *n* is increased, 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	1~~2~~0	Equity price (small cap) volatility	120
Interest rate ~~ATM volatility –~~ – other currencies	2~~6~~0	Equity (other)	120
Interest rate ATM volatility~~Interest rate (other)~~	60	FX rate ~~–~~ – liquid currency pairs	1~~2~~0
Interest rate ~~ATM volatility~~ (other than yields and ATM volatility)	60	FX rate (other currency pairs)[3]	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

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

2 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.

3 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.

Annex 1

Draft Accord text on market risk – the standardised approach

1. General provisions

1. The standardised approach must be calculated by all banks and reported to supervisors [monthly]. In addition, all banks must calculate, and have the ability to produce to their supervisors, the standard rules calculations on demand.

2. If no explicit approach is set out for a particular instrument, a bank should apply the rules and principles in this section by analogy, and should do so in a way that results in a prudent capitalisation of risk.

3. The standardised approach uses sensitivities as inputs (apart from curvature and default risk). Risk factors and sensitivities must meet the definition provided in Section 3. Sensitivities must be computed by banks in accordance with the sensitivity validation standards described in [Section 4].

4. Sensitivities are used as inputs into aggregation formulae which are intended to recognise hedging and diversification benefits of positions in different risk factors within an asset class. Risk weights and correlations are prescribed by the Committee. Their values are provided in Section 5.

2. Structure of the standardised approach

5. The standardised approach capital requirement is the simple sum of the linear (delta and vega) and curvature requirements for GIRR, CSR (non-securitisations), CSR (securitisation non-correlation trading portfolio), CSR (correlation trading portfolio), equity, commodity and FX risks, plus the requirements for default risk (non-securitisations), default risk (securitisation non-correlation trading portfolio) and default risk (correlation trading portfolio).

6. This section sets out the framework for calculating capital requirements for linear and curvature risks. The framework for calculating default risk capital requirements is set out in Section 6.

7. Prior to applying the calculations in this section, positions in the same risk factor should be fully offset.

8. The following step-by-step approach to capture delta [and vega] risk should be separately applied to each asset class (apart from default risk):

(a) Find a net sensitivity across instruments to each risk factor *k*, as defined in Section 3 for each asset class.

(b) Weight the net sensitivity to each risk factor *k* by the corresponding risk weight RW_k according to the bucketing structure for each asset class set out in Section 5.

$$WS_k = RW_k s_k$$

(c) Weighted sensitivities should then be aggregated within each bucket. The buckets and correlation parameters applicable to each asset class are set out in Section 5.

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

[In instances where the number under the square root is negative, it should be floored at 0.]

(d) Capital charges should then be aggregated across buckets within each asset class. The correlation parameters, γ_{bc}, applicable to each asset class are set out in Section 5.

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

where $S_b = \sum_{k=1}^{K} WS_k$ for all risk factors in bucket b and $S_c = \sum_{k=1}^{K} WS_k$ for all risk factors in bucket c.

[In instances where the number under the square root is negative, it should be floored at 0.]

9. Instruments in the trading book that are options or possibly include an option (eg embedded options such as prepayment and convertibility) are subject to additional capital requirements for (i) curvature risk and (ii) vega risk. Instruments not subject to optionality are subject to neither curvature risk nor vega risk.

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

(a) For GIRR and CSR risk factors, the curvature risk exposure with respect to curvature risk factor k is computed at the portfolio level using the following formula:

$$CVR_k = -min\begin{bmatrix} \sum_i V(x_{it} + RW_{ik} \forall t \in k) - V(x_{it} \forall t \in k) - \sum_{t \in k} RW_{it} \cdot s_{it} \\ \sum_i V(x_{it} - RW_{ik} \forall t \in k) - V(x_{it} \forall t \in k) + \sum_{t \in k} RW_{it} \cdot s_{it} \end{bmatrix}$$

where:

- i is an instrument subject to optional risks associated with delta risk factor t;
- $V(x_{it})$ is the price of instrument i depending on the relevant delta risk factor t;
- $V(x_{it} + RW_{ik} \forall t \in k)$ is the price of instrument i after a parallel shift of the yields/spreads x_{it} at all the tenors t of curve k;
- X_{it} is the current level of risk factor t for instrument i;
- s_{it} is the delta of instrument i with respect to delta risk factor t, defined in Section 3 (b); and
- RW_{ik} is the absolute shift applicable to curvature risk factor k, for instrument i, as set out in Section 5.

For equity, commodity and FX risk factors, the curvature risk exposure is computed with respect to the risk factor k using the following formula:

$$\mathrm{CVR_k} = -\min\begin{bmatrix} \sum_i \mathrm{V}(\mathrm{x_{ik}} + \mathrm{RW_{ik}}\, \mathrm{x_{ik}}) - \mathrm{V}(\mathrm{x_{ik}}) - \mathrm{RW_{ik}} \cdot s_{\mathrm{ik}} \\ \sum_i \mathrm{V}(\mathrm{x_{ik}} - \mathrm{RW_{ik}}\, \mathrm{x_{ik}}) - \mathrm{V}(\mathrm{x_{ik}}) + \mathrm{RW_{ik}} \cdot s_{\mathrm{ik}} \end{bmatrix}$$

where:

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

- $V(x_{ik})$ is the price of instrument *i* depending on risk factor *k*;
- X_{ik} is the current level of risk factor *k* for instrument *i*;
- s_{ik} is the delta of instrument i with respect to risk factor *k*, defined in Section 3 (b); and
- RW_{ik} is the relative shift applicable to risk factor *k* for instrument *i*, as set out in Section 5.

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

(c) The curvature risk exposure should then 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:

- $\psi(x,y)$ is a function that takes the value 0 if x and y both have negative signs. In all other cases, $\psi(x,y)$ takes the value of 1; and
- ρ_{ij} is the assumed correlation determined according to Section 5.

(d) Capital charges should then be aggregated across buckets within each asset class.

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

where:

- $S_b = \sum_{k=1}^{K} CVR_k$ for all risk factors in bucket *b* and $S_c = \sum_{k=1}^{K} CVR_k$ for all risk factors in bucket *c*;
- $\psi(x,y)$ is a function that takes the value 0 if x and y both have negative signs. In all other cases, $\psi(x,y)$ takes the value of 1; and
- the correlation parameters γ_{bc} applicable to each asset class are set out in Section 5.

3. Definition of the risk factors and the sensitivities

(a) Definition of the delta and curvature risk factors

11. **GIRR risk factors**

- *Delta:* the GIRR delta risk factors are defined along two dimensions: the relevant risk free yield curves of the currency in which an instrument is denominated; and the following tenors/vertices: 0.25 years, 0.5 years, 1 year, 2 years, 3 years, 5 years, 10 years, 15 years, 20 years and 30 years.

  The GIRR delta risk factor also includes a flat curve of risk-neutral inflation rates for each currency. This risk factor is only relevant for an instrument when a cash flow is functionally dependent on a measure of inflation, ie the notional amount or an interest payment depends eg on a consumer price index. GIRR risk factors other than for inflation risk will apply to such an instrument notwithstanding.

- *Curvature:* the GIRR curvature risk factors are defined along one dimension: the relevant yield curve.

12. **CSR non-securitisation risk factors**

- *Delta:* the CSR non-securitisation delta risk factors are defined along two dimensions: the relevant issuer credit spread curves (bond and CDS); and the following tenors/vertices: 1 year, 2 years, 3 years, 5 years and 10 years.
- *Curvature:* the CSR non-securitisation curvature risk factors are defined along one dimension: the relevant issuer credit spread curves (bond and CDS).

13. **CSR securitisation risk factors**

- *Delta:* the CSR securitisation delta risk factors are defined along two dimensions: the relevant issuer/tranche credit spread curves and the following tenors/vertices: 1 year, 2 years, 3 years, 5 years and 10 years.
- *Curvature:* the CSR securitisation curvature risk factors are defined along one dimension: the relevant issuer/tranche credit spread curves (bond and CDS).

For securitisation instruments in the non-correlation trading portfolio, sensitivities should be computed to the tranche.

For securitisation instruments in the correlation trading portfolio, sensitivities should be computed to the underlying names.

14. **Equity risk factors**

- *Delta and curvature:* the equity delta risk factors are all the equity (i) spot prices, (ii) dividend forecasts and (iii) repurchase agreements (repos).

15. **Commodity risk factors**

16. *Delta and curvature:* the commodity delta risk factors are all the commodity spot prices depending on the grade (minimum delivery quality[13]) of the commodity and the delivery location (city).

17. **Exchange rate risk factors**

- *Delta and curvature:* all the exchange rates between the currency in which an instrument is denominated and the reporting currency, depending on whether the position matures in less than a year, one to three years, or more than three years.

  If, for a given instrument, all cash flows are in a single currency (no cross-currency basis risk), its maturity is to be regarded as zero for FX risk purposes.

(b) Definition of the vega risk factors

18. *[There are two categories of GIRR vega risk factors:*

For GIRR, CSR and commodity:

[13] "Grade" refers to the contract grade of the instrument, sometimes known as the "basis grade" or "par grade". This is the minimum accepted standard that a deliverable commodity must meet to be accepted as deliverable against the contract. Where this is not specified for a position, a proxy contract should be used.

- *The term structure of implied volatility risk: one risk position is computed per instrument and per risk factor, as follows. An ATM volatility surface is defined. The matrix is defined along the following two dimensions:*
  - *the maturity of the option is allocated to ranges [delimited by the 10 delta vertices]; and*
  - *the residual maturity of the underlying of the option is allocated to ranges [delimited by the 10 delta vertices].*
- *Smile risk: one risk position is computed per instrument and per risk factor. As the sensitivity to smile, the moneyness (spot divided by strike) is allocated to [6] ranges.*
- *Vega risk positions VR are computed at each node of the cube.*
- *The VR positions are then aggregated based on prescribed correlations.*

For equity and FX:

- *The term structure of implied volatility risk: one risk position is computed per instrument and per risk factor, as follows. An ATM volatility curve is defined. The curve is defined along the dimension:*
  - *the maturity of the option is allocated to [10] ranges.*
- *Smile risk: one risk position is computed per instrument and per risk factor, as the sensitivity to smile. The moneyness (spot divided by strike) is allocated to [6] ranges.*
- *Vega risk positions VR are computed at each node of the matrix.*
- *The VR positions are then aggregated based on prescribed correlations.]*

(c) Definition of sensitivity for each asset class

19. Sensitivities for each asset class are expressed in the reporting currency of the bank.

20. **For GIRR risk factors, the sensitivity is defined as the PV01.**

The PV01 of an instrument *i* with respect to tenor *t* of the risk free curve *r* (ie the sensitivity of instrument *i* with respect to the risk factor r_t) is defined as:

$$s_{i,r_t} = \frac{\mathrm{V_i}(\mathrm{r_t} + 1\mathrm{bp}, \mathrm{cs_t}) - \mathrm{V_i}(\mathrm{r_t}, \mathrm{cs_t})}{1bp}$$

where:

- r_t is the risk-free interest rate curve 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; and
- 1*bp* is 1 basis point, ie 0.0001 or 0.01%.

For the interest rate risk factors, "market rates" (and not "zero coupon rates") should be used to construct the risk-free yield curve, consistent with the validation standards and the "use test" set out in Section 4.

21. **For CSR non-securitisation risk factors, the sensitivity is defined as the CS01.**

The CS01 of an instrument with respect to tenor *t* is defined as:

$$s_{i,cs_t} = \frac{V_i(r_t, cs_t + 1bp) - V_i(r_t, cs_t)}{1bp}$$

22. **For CSR securitisation and nth-to-default risk factors, the sensitivity is defined as the CS01.**

If all the following criteria are met, the position is deemed to be part of the "correlation trading portfolio" (CTP), and the CS01 (as defined for CSR (non-securitisations) above) should be computed with respect to the names underlying the securitisation or nth-to-default instrument:

- The positions are not resecuritisation positions, nor derivatives of securitisation exposures that do not provide a pro rata share in the proceeds of a securitisation tranche.
- All reference entities are single-name products, including single-name credit derivatives, for which a liquid two-way market exists,[14] including traded indices on these reference entities.
- 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.
- The instrument does not reference a claim on a special purpose entity.
- A position that is not a securitisation position and that hedges a position described above.

If any of these criteria are not met, the position is deemed to be non-CTP, and then the CS01 should be calculated with respect to the spread of the instrument rather than the spread of the underlying of the instruments.

23. **For equity risk factors, the sensitivity is defined as follows:**

The value change of an instrument with respect to a 1 percentage point relative change of the equity risk factor:

$$s_{ik} = \frac{\mathrm{V_i}(1.01\ \mathrm{EQ_k}) - \mathrm{V_i}(\mathrm{EQ_k})}{0.01\ \mathrm{EQ_k}}$$

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*.

24. **For commodity risk factors, the sensitivity is defined as follows:**

The value change of an instrument with respect to a 1 percentage point relative change of the commodity price:

[14] 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.

$$s_{ik} = \frac{\mathrm{V_i(1.01\ CTY_k) - V_i(CTY_k)}}{\mathrm{0.01\ CTY_k}}$$

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 price of commodity k.

25. **For FX risk factors, the sensitivity is defined as follows:**

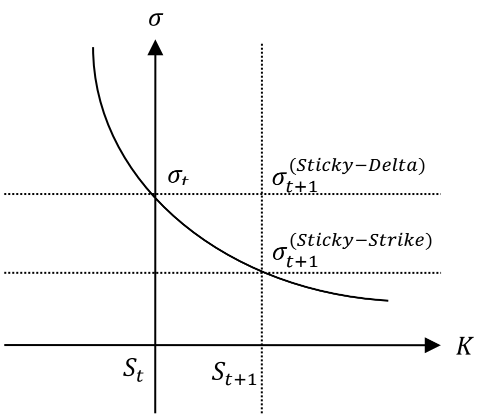
The value change of an instrument with respect to a 1 percentage point relative change of the FX rate:

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

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.

26. 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
t: reporting date
S: underlying price
K: strike price

27. Where appropriate to comply with the validation standards and the "use test" set out in Section 4, banks may also make use of the central or backward difference methods:

For GIRR and CSR:

$$s = \frac{\mathrm{V(x + 0.5bp) - V(x - 0.5bp)}}{1bp}$$

$$s = \frac{\mathrm{V(x) - V(x - 1bp)}}{1bp}$$

For equity, commodity and FX risk:

$$s = \frac{V(1.005\ x) - V(0.995\ x)}{0.01\ x}$$

$$s = \frac{V(\ x) - V(0.99\ x)}{0.01\ x}$$

4. Sensitivity validation standards

[The Committee will determine some validation standards such as a "use test" to be incorporated.]

5. Prescribed risk weights and correlations

(a) General interest rate risk (GIRR)

Risk weights

28. Each currency is considered to be a separate bucket.

29. The risk weights RW_k are set out in the following table:

Risk weights per vertex (in basis points)										
0.25yr	0.5yr	1yr	2yr	3yr	5yr	10yr	15yr	20yr	30yr	Inflation
160	160	150	125	115	100	100	100	100	100	150

30. The sensitivity to the inflation rate, from the exposure to implied coupons in an inflation instrument, should be allocated in the specific inflation vertex. The 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 other interest rate exposures in the same currency.

31. *[The sensitivity to vega risk takes into account the term structure (maturity of the underlying and of the option) and moneyness; it should be allocated to the corresponding currency bucket. A relative risk weight is applied in line with the risk factor liquidity horizon such that* $VR_{ik} = 0.55 \cdot \left(\frac{\sqrt{60}}{\sqrt{10}}\right) \cdot \left(\frac{dV_i}{d\sigma_i} \cdot \sigma_i\right)$*.]*

Correlations

32. The first correlation matrix below for risk exposures with the same sign should be used for ρ_{kl} under the following conditions:

(a) k and l are vertices on the same risk-free yield curve; and

(b) weighted sensitivities or risk exposures have the same sign.

Correlations for aggregated weighted sensitivities or risk exposures with the same sign

	0.25yr	0.5yr	1yr	2yr	3yr	5yr	10yr	15yr	20yr	30yr	Inflation
0.25yr	100%	95%	85%	75%	65%	55%	45%	40%	40%	35%	40%
0.5yr	95%	100%	90%	75%	70%	65%	50%	45%	45%	40%	40%
1yr	85%	90%	100%	90%	85%	75%	60%	50%	50%	50%	40%
2yr	75%	75%	90%	100%	95%	90%	75%	65%	60%	60%	40%
3yr	65%	70%	85%	95%	100%	95%	80%	75%	70%	65%	40%
5yr	55%	65%	75%	90%	95%	100%	90%	85%	75%	70%	40%
10yr	45%	50%	60%	75%	80%	90%	100%	95%	90%	85%	40%
15yr	40%	45%	50%	65%	75%	85%	95%	100%	100%	100%	40%
20yr	40%	45%	50%	60%	70%	75%	90%	100%	100%	100%	40%
30yr	35%	40%	50%	60%	65%	70%	85%	100%	100%	100%	40%
Inflation	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	100%

33. The second correlation matrix below for risk exposures with different signs should be used for ρ_{kl} under the following conditions:

(a) *k* and *l* are vertices on the same risk-free yield curve; and

(b) weighted sensitivities or risk exposures have different signs.

Correlations for aggregated weighted sensitivities or risk exposures with different signs

	0.25yr	0.5yr	1yr	2yr	3yr	5yr	10yr	15yr	20yr	30yr	Inflation
0.25yr	100%	90%	70%	55%	50%	40%	25%	20%	15%	15%	20%
0.5yr	90%	100%	85%	70%	60%	45%	35%	25%	20%	15%	20%
1yr	70%	85%	100%	80%	75%	60%	45%	35%	30%	20%	20%
2yr	55%	70%	80%	100%	90%	75%	55%	40%	40%	40%	20%
3yr	50%	60%	75%	90%	100%	85%	60%	50%	50%	45%	20%
5yr	40%	45%	60%	75%	85%	100%	75%	60%	60%	50%	20%
10yr	25%	35%	45%	55%	60%	75%	100%	85%	75%	65%	20%
15yr	20%	25%	35%	40%	50%	60%	85%	100%	85%	70%	20%
20yr	15%	20%	30%	40%	50%	60%	75%	85%	100%	70%	20%
30yr	15%	15%	20%	40%	45%	50%	65%	70%	70%	100%	20%
Inflation	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	100%

34. Between two yield curves in the same bucket (eg OIS and BOR 3M), basis risk should be recognised. In such cases, the correlation matrices used for ρ_{kl} should then be scaled by multiplication by $(1+x)$ if the two sensitivities have same sign and $(1-x)$ if the two sensitivities have different signs, where x is set at [10] basis points. All correlations are capped at 1.

35. *[Between vega and delta exposures, the correlation is set at 1 for same-sign risk positions and –1 for different-sign risk positions; Between vega exposures, the correlations are the same as between delta exposures.]*

36. The parameter γ_{bc} = 0.5 should be used for aggregating across different currencies.

37. Between curvature exposures, the delta correlation parameters ρ_{kl} and γ_{bc} should be squared.

(b) Credit spread risk (CSR): non-securitisations

Risk weights

38. 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 gov't-backed financials, real estate activities
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 gov't, gov't-backed corporates (non-financial), education, public administration, professional and technical activities
7	High yield (HY) & non-rated (NR)	Sovereigns including central banks, multilateral development banks
8		Financials including gov't-backed financials, real estate activities
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 gov't, gov't-backed corporates (non-financial), education, public administration, and professional and technical activities
Residual		

39. The same risk weight should be used for all vertices (1yr, 2yr, 3yr, 5yr, 10yr), according to bucket, as set out in the following table:

Bucket number	Risk weight (in basis points)
1	250
2	500
3	350
4	300
5	250
6	200
7	1,000
8	1,200
9	900
10	1,000
11	900
12	600
Residual	1,200

40. *[The sensitivity to volatility risk takes into account the term structure (maturity of the underlying and of the option) and moneyness; it should be allocated to the corresponding bucket. A relative risk weight is applied in line with the risk factor liquidity horizon such that* $VR_{ik} = 0.55 \cdot \left(\frac{\sqrt{250}}{\sqrt{10}}\right) \cdot \left(\frac{dV_i}{d\sigma_i} \cdot \sigma_i\right)$.*]*

Correlations

41. The correlation parameters ρ_{kl} applying to sensitivity or risk exposure pairs within the same bucket are set out in the following table:

	Same name	Different name
Aggregate sensitivities have the same sign	90%	40%
Aggregate sensitivities have different signs	60%	10%
Residual bucket: aggregate sensitivities have the same sign	100%	
Residual bucket: aggregate sensitivities have different signs	0%	

42. Between two credit spread curves in the same bucket (eg bond, CDS, index constituent/single name), basis risk should be recognised. In such cases, the correlation parameters used for ρ_{kl} should then be scaled by multiplication by $(1 + x)$ if the two sensitivities have the same sign and $(1 - x)$ if the two sensitivities have different signs, where x is set at [10] basis points. All correlations are capped at 1.

43. *[Between vega and delta exposures, the correlation is set at 1 for same-sign risk positions and –1 for different-sign risk positions; Between vega exposures, the correlations are the same as between delta exposures.]*

44. The correlation parameters γ_{bc} applying to sensitivity or risk exposure pairs across different non-residual buckets are set out in the following table:

Bucket	1	2	3	4	5	6	7	8	9	10	11	12
1	100%	10%	20%	25%	20%	15%	20%	15%	20%	20%	20%	15%
2	10%	100%	5%	15%	20%	5%	10%	15%	5%	15%	0%	30%
3	20%	5%	100%	20%	25%	5%	10%	15%	0%	25%	0%	40%
4	25%	15%	20%	100%	25%	5%	10%	15%	0%	25%	5%	40%
5	20%	20%	25%	25%	100%	5%	15%	20%	10%	20%	20%	15%
6	15%	5%	5%	5%	5%	100%	10%	15%	5%	20%	10%	30%
7	20%	10%	10%	10%	15%	10%	100%	25%	15%	20%	15%	20%
8	15%	15%	15%	15%	20%	15%	25%	100%	20%	20%	20%	15%
9	20%	5%	0%	0%	10%	5%	15%	20%	100%	25%	15%	15%
10	20%	15%	25%	25%	20%	20%	20%	20%	25%	100%	15%	20%
11	20%	0%	0%	5%	20%	10%	15%	20%	15%	15%	100%	15%
12	15%	30%	40%	40%	15%	30%	20%	15%	15%	20%	15%	100%

45. Between curvature exposures, the delta correlation parameters ρ_{kl} and γ_{bc} should be squared.

(c) Credit spread risk (CSR): securitisations

(i) Correlation trading portfolio

46. Sensitivities to CSR arising from the correlation trading portfolio 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 of the CSR non-securitisations are modified to reflect the liquidity horizons and basis risk is captured more conservatively.

47. The same risk weight should be used for all vertices (1yr, 2yr, 3yr, 5yr, 10yr), according to bucket, as set out in the following table:

Bucket number	Risk weight (in basis points)
1	489
2	839
3	556
4	499
5	347
6	320
7	1,565
8	1,659
9	1,201
10	1,472
11	1,211
12	897
Residual	1,659

48. *[The sensitivity to volatility risk takes into account the term structure (maturity of the underlying and of the option) and moneyness; it should be allocated to the corresponding bucket. A relative risk weight is applied in line with the risk factor liquidity horizon such that* $VR_{ik} = 0.55 \cdot \left(\frac{\sqrt{250}}{\sqrt{10}}\right) \cdot \left(\frac{dV_i}{d\sigma_i} \cdot \sigma_i\right)$*.]*

49. In order to capture correlation risk on top of basis risk in correlation trading portfolio securitisation positions, the x value in paragraph 56 is set at [100] basis points.

(ii) Other securitisation positions

50. Sensitivities to credit spread risk arising from non-correlation trading portfolio securitisation positions are treated according to the risk weights and correlations specified in the next paragraphs.

Risk weights

51. 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)	RMBS/CMBS
2		Credit card ABS
3		Auto ABS
4	High yield (HY) & non-rated (NR)	RMBS/CMBS
5		Credit card ABS
6		Auto ABS
7	Residual	

52. The risk weights are set out in the following table:

Bucket number	Risk weight (in basis points)
1	800
2	1,300
3	900
4	3,000
5	5,000
6	3,600

53. If it is not possible to allocate a sensitivity or risk exposure to one of these buckets (for example, because data on categorical variables are not available), then the position must be allocated to a "residual bucket". The risk weights for the residual bucket are as follows:

Bucket number	Risk weight (in basis points)
7	5,000

54. *[The sensitivity to volatility risk takes into account the term structure (maturity of the underlying and of the option) and moneyness; it should be allocated to the corresponding bucket. A relative risk weight is applied in line with the risk factor liquidity horizon such that* $VR_{ik} = 0.55 \cdot \left(\frac{\sqrt{250}}{\sqrt{10}}\right) \cdot \left(\frac{dV_i}{d\sigma_i} \cdot \sigma_i\right)$*.]*

Correlations

55. For the other buckets, the correlation parameters ρ_{kl} applying to sensitivity or risk exposure pairs within the same bucket are set out in the following table:

	Same underlying names (more than 80% overlap in notional terms)	Different underlying names (less than 80% overlap in notional terms)
Aggregate sensitivities have the same sign	100%	80%
Aggregate sensitivities have different signs	40%	0%
Residual bucket: aggregate sensitivities have the same sign	100%	
Residual bucket: aggregate sensitivities have different signs	0%	

56. Between two curves in the same bucket (eg bond, CDS, index constituent/single name), basis risk should be recognised. In such cases, the correlation ρ_{kl} should then be scaled by multiplication by $(1 + x)$ if the two sensitivities have the same sign and $(1 - x)$ if the two sensitivities have different signs, where x is set at [10] basis points. All correlations are capped at 1.

57. *[Between vega and delta exposures, the correlation is set at 1 for same-sign risk positions and –1 for different-sign risk positions; Between vega exposures, the correlations are the same as between delta exposures.]*

58. The correlation parameters γ_{bc} applying to sensitivity or risk exposure pairs across different buckets are set out in the following table:

	Sensitivities or risk exposures with the same sign	Sensitivities or risk exposures with different signs
Non-residual bucket to non-residual bucket	0%	0%

59. Between curvature exposures, the delta correlation parameters ρ_{kl} and γ_{bc} should be squared.

(d) Equity risk

Risk weights

60. Sensitivities should first be assigned to a bucket according to the buckets defined in the following table:

Bucket number	Size	Region	Sector
1	Large	Emerging market economies	Consumer goods and services, transportation and storage, administrative and support service activities, utilities
2			Telecommunications, industrials
3			Basic materials, energy, agriculture, manufacturing, mining and quarrying
4			Financials including gov't-backed financials, real estate activities, technology
5		Advanced economies	Consumer goods and services, transportation and storage, administrative and support service activities, utilities
6			Telecommunications, industrials
7			Basic materials, energy, agriculture, manufacturing, mining and quarrying
8			Financials including gov't-backed financials, real estate activities, technology
9	Small	Emerging market economies	All sectors
10		Advanced economies	All sectors

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

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

63. 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.

64. The sector definition is the one generally used in the market. When allocating an equity position to a particular bucket, the bank must prove that the equity issuer's most material activity indeed corresponds to the bucket's definition. Acceptable proofs might be external providers' information, or internal analysis.

65. 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.

66. If it is not possible to allocate a position to one of these buckets (for example, because data on categorical variables are not available), then the position must be allocated to a "residual bucket". Risk weights should be assigned to each notional position as in the following table:

Bucket number	Risk weight (percentage of equity price)
1	55
2	60
3	45
4	55
5	30
6	35
7	40
8	50
9	70
10	50
Residual bucket	70

67. *[The sensitivity to volatility risk takes into account the term structure (maturity of the option) and moneyness; it should be allocated to the corresponding bucket. A relative risk weight is applied in line with the risk factor liquidity horizon such that* $VR_{ik} = 0.55 \cdot \left(\frac{\sqrt{20}}{\sqrt{10}}\right) \cdot \left(\frac{dV_i}{d\sigma_i} \cdot \sigma_i\right)$ *for large caps and* $VR_{ik} = 0.55 \cdot \left(\frac{\sqrt{120}}{\sqrt{10}}\right) \cdot \left(\frac{dV_i}{d\sigma_i} \cdot \sigma_i\right)$ *for small caps.]*

Correlations

68. The correlation parameters ρ_{kl} applying to sensitivity or risk exposure pairs within the same bucket are set out in the following table:

Bucket number	Same sign	Different sign
1	20%	10%
2	20%	15%
3	25%	15%
4	30%	20%
5	20%	10%
6	30%	15%
7	35%	20%
8	35%	20%
9	15%	5%
10	25%	10%
Residual bucket	100%	–100%

69. Between two risk factors related to the same name (eg equity spot, dividend forecasts, repos, index constituents/single name), basis risk should be recognised. In such cases, the correlation ρ_{kl} should then be scaled by multiplication by $(1 + x)$ if the two sensitivities have the same sign and $(1 - x)$ if the two sensitivities have different signs, where x is set at [10] basis points. All correlations are capped at 1.

70. *[Between vega and delta exposures, the correlation is set at 1 for same sign risk positions and –1 for different signs risk positions; Between vega exposures, the correlations are the same as between delta exposures.]*

71. The correlation parameters γ_{bc} applying to sensitivity or risk exposure pairs across different non-residual buckets are set out in the following table:

Buckets	1	2	3	4	5	6	7	8	9	10
1	–	15%	15%	15%	10%	10%	10%	10%	10%	10%
2	15%	–	15%	15%	10%	10%	10%	10%	10%	10%
3	15%	15%	–	15%	10%	10%	10%	10%	10%	10%
4	15%	15%	15%	–	10%	10%	10%	10%	10%	10%
5	10%	10%	10%	10%	–	20%	20%	20%	10%	15%
6	10%	10%	10%	10%	20%	–	20%	20%	10%	15%
7	10%	10%	10%	10%	20%	20%	–	20%	10%	15%
8	10%	10%	10%	10%	20%	20%	20%	–	10%	15%
9	10%	10%	10%	10%	10%	10%	10%	10%	–	10%
10	10%	10%	10%	10%	15%	15%	15%	15%	10%	–

72. The correlation parameters applying to sensitivity or risk exposure pairs across the non-residual buckets and the residual one are set out in the following table:

	Sensitivities with the same sign	Sensitivities with different signs
Non-residual bucket to residual bucket	100%	–100%

73. Between curvature exposures, the delta correlation parameters ρ_{kl} and γ_{bc} should be squared.

(e) Commodity risk

Risk weights

74. The risk weights depend on the commodity type; they are set out in the following table:

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

75. *[The sensitivity to volatility risk takes into account the term structure (maturity of the underlying and of the option) and moneyness; it should be allocated to the corresponding bucket. A relative risk weight is applied in line with the risk factor liquidity horizon such that* $VR_{ik} = 0.55 \cdot \left(\frac{\sqrt{60}}{\sqrt{10}}\right) \cdot \left(\frac{dV_i}{d\sigma_i} \cdot \sigma_i\right)$ *for energy and precious metals and* $VR_{ik} = 0.55 \cdot \left(\frac{\sqrt{120}}{\sqrt{10}}\right) \cdot \left(\frac{dV_i}{d\sigma_i} \cdot \sigma_i\right)$ *for other commodities.]*

Correlations

76. The correlation parameters ρ_{kl} applying to sensitivity or risk exposure pairs within the same commodity are set out in the following table:

Correlations	Different sign	Same sign
Coal	35%	75%
Crude oil	95%	95%
Electricity	20%	55%
Freight	65%	90%
Metals	45%	70%
Natural gas	30%	95%
Precious metals	35%	75%
Other	–10%	15%
Grains & oilseed	30%	60%
Livestock & dairy	0%	30%
Softs & other agriculturals	25%	50%

77. Between two risk factors related to the same commodity (eg commodity spot, same commodity but grade difference, same commodity but maturity difference over six months, same commodity but different delivery location, index constituents/single name), basis risk should be recognised. In such cases, the correlation ρ_{kl} should then be scaled by multiplication by $(1 + x)$ if the two sensitivities have the same sign and $(1 - x)$ if the two sensitivities have different signs, where x is set at [10] basis points. All correlations are capped at 1.

78. *[Between vega and delta exposures, the correlation is set at 1 for same sign risk positions and –1 for different signs risk positions; between vega exposures, the correlations are the same as between delta exposures.]*

79. The correlation parameters γ_{bc} applying to sensitivity or risk exposure pairs across different non-residual buckets are set out in the following table:

Buckets	1	2	3	4	5	6	7	8	9	10	11
1	–	35%	5%	20%	20%	25%	15%	0%	25%	10%	20%
2	35%	–	5%	45%	45%	15%	30%	0%	35%	5%	35%
3	5%	5%	–	0%	5%	0%	15%	0%	0%	5%	5%
4	20%	45%	0%	–	25%	0%	10%	0%	15%	0%	15%
5	20%	45%	5%	25%	–	5%	25%	0%	25%	10%	35%
6	25%	15%	0%	0%	5%	–	5%	0%	15%	0%	10%
7	15%	30%	15%	10%	25%	5%	–	0%	15%	0%	20%
8	0%	0%	0%	0%	0%	0%	0%	–	0%	0%	0%
9	25%	35%	0%	15%	25%	15%	15%	0%	–	5%	30%
10	10%	5%	5%	0%	10%	0%	0%	0%	5%	–	10%
11	20%	35%	5%	15%	35%	10%	20%	0%	30%	10%	–

80. Between curvature exposures, the delta correlation parameters ρ_{kl} and γ_{bc} should be squared.

(f) Foreign exchange risk

81. For each currency, sensitivities are separately allocated to one of the following term buckets:

Term bucket	Maturity
1	Less than 1 year
2	1 year to 3 years
3	More than 3 years

"Maturity" means the remaining contractual maturity.

Risk weights

82. A unique relative risk weight equal to 15% of FX rate (FX_k) applies to all the FX sensitivities or risk exposures.

83. *[The sensitivity to volatility risk takes into account the term structure (maturity of the underlying and of the option) and moneyness; it should be allocated to the corresponding bucket. A relative risk weight is applied in line with the risk factor liquidity horizon such that* $VR_{ik} = 0.55 \cdot \left(\frac{\sqrt{60}}{\sqrt{10}}\right) \cdot \left(\frac{dV_i}{d\sigma_i} \cdot \sigma_i\right)$*.]*

Correlations

84. The correlation parameters ρ_{kl} applying to sensitivity or risk exposure pairs within the same bucket are set out in the following table:

Net exposures with the same sign			
Term bucket	**1**	**2**	**3**
1			
2	95%		
3	70%	85%	

Net exposures with different signs			
Term bucket	**1**	**2**	**3**
1			
2	90%		
3	65%	80%	

85. A uniform correlation parameter γ_{bc} equal to 60% applies to sensitivity or risk exposure pairs across different non-residual buckets.

86. Between curvature exposures, the delta correlation parameters ρ_{kl} and γ_{bc} should be squared.

6. Capitalisation of default risk

87. The capital requirement for default risk is the sum of the requirements for default risk of non-securitisations and default risk of securitisations. The methodology for calculating these requirements is set out in the following sections.

88. 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.

89. 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, especially to securities denominated in a currency other than that of the issuing government.

(g) Default risk: non-securitisations

90. The following steps should be followed by a bank calculating a capital charge for default risk (non-securitisations). Within each asset class category, a capital charge is calculated as described in the following procedure. The categories for this purpose are corporates, sovereigns, local governments/municipalities, and securitisations including CTP (see also Section H). The procedure involves determining jump-to-default (JTD) loss amounts by applying loss-given-default (LGD) risk weights to positions, determining hedging and offsetting benefit, and applying default risk weights.

91. 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 (see CP2 on page 11). 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.

92. The starting point in the calculation of the capital charge described below is the notional amount and mark-to-market loss already taken 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 P&L. For all instruments, the notional amount in the JTD equation below 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 (MtM) gain/loss 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 in the JTD equation

Instrument	Notional	Bond-equivalent market value	MtM loss
Bond	Face value of bond	Market value of bond	Face value – market 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	Notional – (strike – MtM value of option)
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 MtM loss for derivative instruments.

MtM loss = notional – bond-equivalent market value.

JTD = max [LGD x notional – MtM loss, 0], in the case of a long position (see definition below 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 MtM loss for a sold put option, a lower strike results in a lower JTD loss.

93. 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 one in 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.

94. The approach for the standardised default risk capital charge comprises a multi-step procedure. In the first step, JTD loss amounts are determined; second, offsetting of JTD amounts of long and short positions, where permissible, produces net long and net short amounts in distinct obligors; third, a hedging benefit discount is applied to the net short positions; and finally, default risk weights are applied to positions to arrive at the capital charge. The procedure is specified in the following steps. In the procedure, offsetting refers to the netting of exposures (where a short position may be subtracted in full from a long position), while hedging refers to the application of a partial hedge benefit (where the long and short positions do not fully offset due to basis or correlation risks).

(1) Determine risk weight exposures based on LGD of asset class

95. LGD risk weights are assigned to positions to determine the JTD loss amount. The JTD amount is determined by the LGD, notional amount (or face value) and MtM loss (or gain) already taken on the position:

$$\text{JTD (long)} = \max [\text{LGD} \times \text{notional} - \text{MtM loss}, 0]$$

$$\text{JTD (short)} = \min [\text{LGD} \times \text{notional} - \text{MtM gain}, 0]$$

where MtM loss (or gain) is the mark-to-market loss (or gain) already taken on the exposure, and *notional* is the bond-equivalent notional (or face value) of the position. In the equations, the notional of a long (short) position is recorded as a positive (negative) value, while the MtM loss (gain) is recorded as a positive (negative) value (ie the negative of the cumulative P&L of the position).

96. Equity instruments and non-senior debt instruments are assigned an LGD of 100%. Senior debt instruments are assigned an LGD of 75%.

(2) Offset exposures to the same obligor

97. The JTD amount of long positions and that of short positions to the same obligor may be offset where the short position has the same or lower seniority relative to the long (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). Exposures of different maturities that meet this offsetting criterion may be offset as follows. Exposures longer than the capital horizon (one year) may be fully offset, but in the case of a 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 positions' 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.[15] 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.

(3) Discount the net short positions by the ratio of long to gross long and short JTD amounts

Sum the net long JTD amounts

98. A simple sum of the net 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.

Sum the net short JTD amounts

99. A simple sum of the net 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.

Derive the WtS ratio

100. The weighting term *WtS*, which is the ratio of long to gross long and short JTD amounts, is applied to short positions to discount their hedge benefit (see the capital equation in step (5) below), where *WtS* is defined as:

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

where the summation is across the credit quality categories (ie rating bands), and the JTD amount is as specified above.

15 Since the capital horizon is one year, the default loss within the one-year horizon from long vs short exposures longer than one year will fully offset regardless of the maturity difference of the products. For longer-than-one-year vs less-than-one-year exposures, however, the default loss only partially offsets.

(4) Assign default risk weights according to the credit quality of the underlying name

101. Default risk weights are assigned to JTD amounts by credit quality categories (ie rating bands), as in the following table:

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%

(5) Calculate the capital requirement for each asset class category

102. The overall capital charge for each asset class category (eg corporate debt) should then be calculated as the sum of the risk-weighted long positions less the discounted risk-weighted short positions, which recognises a hedging benefit:

$$\text{Capital charge for each asset class category} = \max\left(\sum RW\ long - WtS \times \sum RW\ short,\ 0\right)$$

where the summation is across the credit quality subcategories (ie rating bands) and the weighting term *WtS* is as defined in step 3, while *RW long* represents the risk-weighted long positions and *RW short* the risk-weighted short positions:

$$RW\ long = \text{default risk weight} \times JTD_{long}$$

$$RW\ short = \text{default risk weight} \times |JTD_{short}|$$

where default risk weight is as in the table above, JTD_{long} and JTD_{short} are as specified in step 1, and the multiplication is within each credit quality category (ie rating band).

(6) Calculate the overall capital requirement for default risk

103. No hedging is recognised across different asset class categories. Therefore, the total capital charge for default risk must be calculated as a simple sum of the asset class category-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. The categories are corporates, sovereigns, local governments/municipalities, and securitisations.

(h) Default risk: securitisations

104. For default risk (securitisations), the same approach should be followed as for default risk (non-securitisations). However, the default risk weights are defined by tranche (instead of by credit quality category), and additional constraints apply to the recognition of offsetting and hedging. For the correlation trading portfolio, further specific treatment of offsetting and hedging is specified in the CTP subsection below. As is the case for default risk (non-securitisations), offsetting refers to the netting of exposures (where a short position may be subtracted in full from a long position), while hedging refers to the application of a partial hedge benefit (where the long and short positions do not fully offset).

105. 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.

Constraints on offsetting for securitisations

106. For default risk (securitisations), the definition of the same "obligor" for the purposes of offsetting is limited to a specific tranche and underlying asset pool. This means that:

- no offsetting is permitted across securitisations of different asset pools, even if the tranche is the same; and
- no offsetting is permitted across tranches of the same asset pool.

107. 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.

Constraints on hedging for securitisations

108. For default risk (securitisations), the hedging benefit recognised under step (3) of the default risk framework is constrained as follows:

- A hedging benefit is allowed within regions. No hedging benefit between long and short exposures across regions is allowed, except for corporates. For example, in the case of ABS, no hedging of North America vs Europe or Europe vs Asia is allowed.
- No hedging is permitted across asset classes (such as ABS vs RMBS).
- Hedging is allowed among corporate securitised exposures, within tranche groups across regions.
- Hedging is allowed among tranche groups (subject to the restrictions above).

See the section below for offsetting and hedging treatment in the correlation trading portfolio.

Default risk weights for securitisations

109. 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.[16] 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.

[16] Basel Committee on Banking Supervision, *Revisions to the Securitisation Framework*, December 2014, www.bis.org/bcbs/publ/d303.htm

Capital requirement for each securitisation asset class category

110. The capital charge for default risk (securitisations) is determined in a similar approach to that for non-securitisations. First, offsetting of long and short positions with respect to like "obligors" determines net long and net short exposures by tranche, subject to the restrictions specified above. (In this step, the determination of the JTD from LGD does not apply since the LGD and JTD amounts are included in the default risk weights of the banking book treatment.) Next, within an asset category in which hedging is allowed (see above), the hedge benefit discount (*WtS* as defined in the section on default risk non-securitisations) is applied to net short positions in that asset category. The approach is similar to that of default risk non-securitisations except that the calculation is applied to tranches instead of credit quality categories. Next, the default risk weights by tranche are applied, and the capital charge for the asset category is determined as specified in step (5) in default risk non-securitisations.

[The final specification of the hedge benefit discount (WtS) may be different from the specification in this draft depending on the outcome of a calibration exercise.]

111. As specified above, the procedure is applied only within asset categories in which offsetting and hedging are allowed. The capital charges for each asset category are then summed without any diversification or hedging benefit across categories.

Correlation trading portfolio

112. The approach for the capital charge for CTP follows the same procedure as default risk (non-securitisations) by first determining the net long and net short exposures after permissible offsetting, and then applying risk weights and a hedging benefit discount to arrive at the capital charge. The risk weights for CTP are based on the proposed risk weights in the corresponding treatment for the banking book, which will be released in a separate Basel Committee publication.

Allocation of exposures by index and tranche

113. 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. Notional amounts should correspond to the remaining principal amount in the underlying asset pools.

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

- attachment point = (N – 1) / Total Names
- detachment point = N / Total Names

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

Offsetting and determination of net long and net short amounts for CTP

115. 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.

116. 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).

117. 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 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.

118. 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.

Hedging benefit and calculation of capital charge for CTP

119. For the CTP capital charge, after the determination of net long and net short exposures as specified above, the same approach for application of a hedge benefit and default risk weights should be followed as for default risk (non-securitisations) but with risk weights as specified for securitisations in the banking book as described above in the section *Capital requirement for each securitisation asset class category*.

[The final specification of the hedge benefit discount (WtS) may be different from the specification here depending on the outcome of a calibration exercise.]