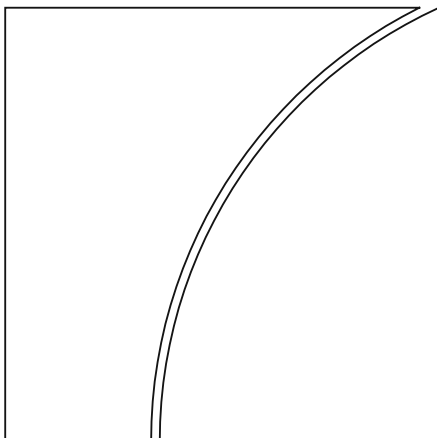# Basel Committee
on Banking Supervision

Frequently asked questions on market risk capital requirements

March 2018 (update of FAQs published in January 2017)

BANK FOR INTERNATIONAL SETTLEMENTS

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Introduction

In January 2016, the Basel Committee on Banking Supervision ("the Committee") published the standard *Minimum capital requirements for market risk*.[1] To promote consistent global implementation of the standard, the Committee has agreed to periodically review frequently asked questions (FAQs) and publish answers along with any technical elaboration of the standards text and interpretative guidance that may be necessary.

This document sets out an updated set of responses to questions that on the January 2016 market risk framework. The FAQs are grouped to sections pertaining to (i) the standardised approach, (ii) the internal models approach and (iii) the trading book boundary. FAQs that have been added since the publication of the previous version of this document in January 2017 are shaded yellow.

1. Standardised approach

1.1 Sensitivities-based method overview

Q1.   In the context of delta sensitivity calculations, is it acceptable to use alternative formulations of sensitivities calculations that yield results very close to the prescribed formulation of sensitivities calculations?

Relevant provisions: paragraphs 47 (c), 67 and 71 of the January 2016 market risk framework.

Answer: Yes, as per paragraph 47 (c), a bank may make use of alternative formulations of sensitivities based on pricing models that the bank's independent risk control unit uses to report market risks or actual profits and losses to senior management. In doing so, the bank is to demonstrate to its supervisor that the alternative formulations of sensitivities yield results very close to the prescribed formulations.

Q2.   Instruments with optionality are subject to vega and curvature risk charges. Are vega and curvature risk charges also applicable to instruments with no optionality that are hedged by instruments with optionality? For example, convexity adjustments on constant maturity swaps (CMS) and other products can generate significant vega risks, which are hedged using plain vanilla interest rate swaptions which are subject to vega and curvature.

Relevant provisions: paragraph 49 (a) of the January 2016 market risk framework.

Answer: Yes, only instruments with non-zero vega sensitivities are subject to vega and curvature risk charges. In the example cited, CMS are subject to vega and curvature risk charges.

Q3.   When the delta effect is removed in the calculation of the curvature risk charge, should the delta used in that calculation be the same as the delta used in the delta risk charge? Should the same assumptions that go into the calculation of the delta (ie sticky delta for normal or log-normal volatilities) go into the calculation of the shifted or shocked price of the instrument?

Relevant provisions: paragraph 52 of the January 2016 market risk framework.

Answer: The delta used for the calculation of the curvature risk charge should be the same as that used for calculating the delta risk charge. The assumptions that are used for the calculation of the delta (ie sticky

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[1]   Basel Committee on Banking Supervision, *Minimum capital requirement for market risk*, January 2016, www.bis.org/bcbs/publ/d352.pdf.

Q4.   May risk weights be floored for interest rate and credit instruments when applying the risk weights for general interest rate risk (GIRR) or for credit spread risk (CSR), given that there is a possibility of the interest rates being negative (eg for JPY, EUR curves)?

<u>Relevant provisions</u>: paragraph 53 of the January 2016 market risk framework.

Answer: No such floor is permitted in the market risk standard.

Q5.   For general interest rate risk (GIRR), credit spread risk (CSR), equity risk, commodity risk or FX risk, risk factors need to be assigned to prescribed vertices. How should this assignment be performed if the internally used vertices do not match the prescribed ones?

<u>Relevant provisions</u>: paragraphs 59, 60, 62, 63, 64, 65 and 66 of the January 2016 market risk framework.

Answer: Banks are not permitted to perform capital computations based on internally used vertices. Risk factors and sensitivities must be assigned to the prescribed vertices. As stated in footnotes 15, 21 and 22, assignment of risk factors and sensitivities to the specified vertices should be performed by linear interpolation or a method that is most consistent with the pricing functions used by the independent risk control function of the bank to report market risks or profits and losses to senior management.

Q6.   Under the sensitivities-based method, would a bank need to compute vega risk over the longest maturity for a cancellable swap? Would a bank also be required to compute residual risk for cancellable swaps?

<u>Relevant provisions</u>: paragraph 68 of the January 2016 market risk framework.

Answer: In the case where options do not have a specified maturity (eg cancellable swaps), the bank must assign those options to the longest prescribed maturity vertex for vega risk sensitivities and also assign such options to the residual risk add-on.

In the case of the bank viewing the optionality of the cancellable swap as a swaption, the bank must assign the swaption to the longest prescribed maturity vertex for vega risk sensitivities (as it does not have a specified maturity) and derive the residual maturity of the underlying of the option accordingly.

Q7.   Regarding paragraph 71 on first-order sensitivity for instruments with optionality, should the requirement to apply a "sticky delta" approach be understood as a prohibition to use "sticky strike"?

<u>Relevant provisions</u>: paragraphs 67 and 71 of the January 2016 market risk framework.

Answer: Both sticky delta and sticky strike approaches are permitted.

Q8.   Should the risk weight for the curvature risk charge be the highest prescribed delta risk weight for each risk class, or should it be the highest prescribed delta risk weight for each of the delta risk factors which are shocked together in order to determine the curvature risk charge?

<u>Relevant provisions</u>: paragraph 132 of the January 2016 market risk framework.

Answer: The risk weight for the curvature risk charge should be the highest prescribed delta risk weight for each of the delta risk factors which are shocked together to determine the curvature risk charge.

1.2   Correlation scenarios

Q1.   Please confirm that for the purposes of paragraphs 54 and 55, the "ultimate portfolio" is the group-level aggregated portfolio when calculating the standardised approach capital charge for paragraphs 45 and

193 and the individual desk portfolio when calculating the standardised approach capital charge per paragraph 184?

Relevant provisions: paragraphs 45, 54, 55, 184 and 193 of the January 2016 market risk framework.

Answer: Yes, at the level of either the aggregated portfolio or the trading desk, the standardised approach capital charge is the maximum of the standardised approach capital charges across the three correlation scenarios at the concerned level.

1.3   Residual risk add-on (RRAO)

Q1.   Can hedges (for example, dividend swaps hedging dividend risks) be excluded from the RRAO?

Relevant provisions: paragraph 58 (f) of the January 2016 market risk framework.

Answer: Hedges may be excluded from the RRAO only if the hedge exactly matches the trade (ie via a back-to-back transaction) as per paragraph 58 (f). For the example cited, dividend swaps should remain within the RRAO.

Q2.   Can total return swap (TRS) products be netted with the underlying product(s) that drive the value of the TRS for the purposes of the RRAO?

Relevant provisions: paragraph 58 of the January 2016 market risk framework.

Answer: As per paragraph 58 (f), a TRS on an underlying product may be excluded from the RRAO charge if there is an equal and opposite exposure in the same TRS. If no exactly matching transaction exists, the entire notional of the TRS would be allocated to the RRAO.

Q3.   Is future realised volatility considered an "exotic underlying" for the purpose of the RRAO?

Relevant provisions: paragraph 58 (d) of the January 2016 market risk framework.

Answer: Yes, future realised volatility is considered an exotic underlying for purposes of the RRAO.

Q4.   Are bonds with multiple call dates considered instruments bearing other residual risks for the purpose of the RRAO?

Relevant provisions: paragraph 58 of the January 2016 market risk framework.

Answer: Yes. Bonds with multiple call dates would be considered as instruments bearing other residual risks, as they are path-dependent options.

1.4   General interest rate risk (GIRR)

Q1.   Are banks permitted to choose between zero rate and market rate sensitivities for GIRR delta and curvature charges?

Relevant provisions: paragraphs 47 (c), 53 (b) and 67 (a) of the January 2016 market risk framework.

Answer: Paragraph 47 (c) states that banks must determine each delta sensitivity, vega sensitivity and curvature scenario based on instrument prices or pricing models that an independent risk control unit within a bank uses to report market risks or actual profits and losses to senior management. Banks should use zero rate or market rate sensitivities consistent with the pricing models referenced in that paragraph.

Q2.   Different results can be produced depending on the bank's curve methodology as diversification will be different for different methodologies. For example, if three-month Euribor is constructed as a "spread to EONIA", this curve will be a spread curve and can be considered as a different yield curve for the purpose of

computing risk-weighted PV01 and subsequent diversification. In this example, should three-month Euribor and EONIA be considered as two distinct yield curves for the purpose of computing the risk charge?

Relevant provisions: paragraph 59 (a) (iii) of the January 2016 market risk framework.

Answer: Paragraph 59 (a) (iii) states that for the purpose of constructing the risk-free yield curve per currency, an overnight index swap curve (such as EONIA) and an interbank offered rate curve (such as three-month Euribor) must be considered two different curves, with distinct risk factors in each tenor bucket, for the purpose of computing the risk charge.

Q3.   When calculating the cross-currency basis spread (CCBS) charge: since pricing models use a term structure-based CCBS curve, is it acceptable to use sensitivities to individual tenors aggregated by simple sum rather than explicitly modelling the CCBS curve as flat in the pricing model?

Relevant provisions: paragraph 59 (c) of the January 2016 market risk framework.

Answer: Yes. Banks may use a term structure-based CCBS curve and aggregate sensitivities to individual tenors by simple sum.

Q4.   Cross-currency basis risk is defined as basis spreads added to a yield curve. Is a bank allowed to aggregate the cross-currency basis risk for both onshore and offshore currency basis risk?

Relevant provisions: paragraph 59 (c) of the January 2016 market risk framework.

Answer: Yes. All cross-currency basis risk for a currency (ie "Curr/USD" or "Curr/EUR") for both onshore and offshore curves may be aggregated via a simple sum of weighted sensitivities.

Q5.   Should inflation and cross-currency bases be included as a risk factor in the vega general interest rate risk (GIRR) charge?

Relevant provisions: paragraph 59 (d) of the January 2016 market risk framework.

Answer: Yes. Inflation and cross-currency bases are included in the GIRR vega risk charge. As no maturity dimension is specified for the delta charge for inflation or cross-currency bases (ie the possible underlying of the option), the vega charge for inflation and cross-currency bases should be considered only along the single dimension of the maturity of the option.

Q6.   Please clarify the example in footnote 17 on the maturity treatment of a cap/floor.

A regular forward starting cap, lasting 12 months, consists of four consecutive caplets on USD three-month Libor. Thus there are four (independent) options, with option expiry dates in 12, 15, 18 and 21 months. These options are all on underlying USD three-month Libor; the underlying always matures three months after the option expiry date (its residual maturity being three months). Accordingly, there are four option maturities of 12, 15, 18 and 21 months, always with an underlying maturity of three months – in contrast to what is stated in footnote 17.

Relevant provisions: paragraph 59 (d) of the January 2016 market risk framework.

Answer: The implied volatilities for a regular forward starting cap, which would start in one year and last for 12 months , should be defined along the following dimensions:

- Maturity of the option's individual components (caplets) – 12, 15, 18, 21 months.

- Residual maturity of the underlying of the option – three months.

Q7.   Should a bank compute delta, vega and curvature risk for callable bonds, options on sovereign bond futures and bond options?

Relevant provisions: paragraphs 59 and 60 of the January 2016 market risk framework.

Answer: For the specified instruments, delta, vega and curvature charges must be computed for both general interest rate risk (GIRR) and credit spread risk (CSR).

Q9. *If banks may use either a log-normal or normal assumption for vega GIRR, does this mean that the same log-normal or normal assumption should be applied to all currencies, or can the application be different for different currencies? For example, is a bank permitted to adopt a normal assumption for EUR and a log-normal assumption for USD?*

Relevant provisions: paragraph 72 of the January 2016 market risk framework.

Answer: To compute vega GIRR, banks may choose a mix of log-normal and normal assumptions for different currencies.

1.5 Credit spread risk (non-securitisations)

Q1. *Does the CSR charge apply to money market instruments (eg bank bills with a tenor of less than one year and interbank placements)?*

Relevant provisions: paragraph 8 of the January 2016 market risk framework.

Answer: Yes. The CSR charge applies to money market instruments to the extent such instruments are covered instruments (ie they meet the definition of instruments to be included in the trading book as specified in paragraphs 8 to 20 of the standard *Minimum capital requirements for market risk*).

Q4.   How are risk weights to be determined when external ratings assigned by credit rating agencies differ and when there are no external ratings available?

Relevant provisions: paragraphs 82 and 152 of the January 2016 market risk framework; paragraphs 97 and 98 of the Basel II framework; paragraph 104 of the Basel III framework.

Answer: Consistent with the treatment of external ratings under paragraphs 97 and 98 of the credit risk framework in Basel II,[2] if there are two ratings which map into different risk weights, the higher risk weight should be applied. If there are three or more ratings with different risk weights, the ratings corresponding to the two lowest risk weights should be referred to and the higher of those two risk weights will be applied.

Consistent with the treatment where there are no external ratings under paragraph 104 of the CVA risk framework in Basel III,[3] where there are no external ratings or where external ratings are not recognised within a jurisdiction, banks may, subject to supervisory approval:

- for the purpose of assigning delta credit spread risk (CSR) non-securitisation risk weights, map the internal rating to an external rating, and assign a risk weight corresponding to either "investment grade" or "high-yield" in the table included in paragraph 82 of the standard *Minimum capital requirements for market risk*;

- for the purpose of assigning default risk weights under the default risk charge, map the internal rating to an external rating, and assign a risk weight corresponding to one of the seven external ratings in the table included in paragraph 152 of the standard *Minimum capital requirements for market risk;* or

- apply the risk weights specified in paragraphs 82 and 154 of the standard *Minimum capital requirements for market risk* for unrated/non-rated categories.

Q5.   For the credit spread risk (CSR) non-securitisation asset class, paragraph 86 states that the correlation parameter ρ_{kl} is not applicable for curvature and no alternative correlation specification is provided. What is the correlation parameter for the computation of curvature risk for the CSR non-securitisation asset class?

Relevant provisions: paragraph 86 of the January 2016 market risk framework.

Answer: Paragraph 86 together with paragraph 85 implies that, for curvature risk of CSR non-securitisation, the correlation parameters $\rho_{kl}^{(basis)}$ and $\rho_{kl}^{(tenor)}$ need not apply and only correlation parameter $\rho_{kl}^{(name)}$ applies between two sensitivities WS_k and WS_l within the same bucket.

Q6.   For the purpose of market risk capital requirements, what are the credit spread risk capital requirements for Fannie Mae and Freddie Mac mortgage-backed security (MBS) bonds? What is the loss-given-default (LGD) for Fannie and Freddie MBS?

Relevant provisions: paragraphs 82 and 144 of the January 2016 market risk framework.

Answer: Non-tranched MBS issued by government sponsored-entities (GSEs), such as Fannie and Freddie, are assigned to Bucket 2 ("Local government, government-backed non-financials, education, public administration") for credit spread risk with a risk weight of 1.0%.

In accordance with paragraph 144, the LGD for non-tranched MBS issued by GSEs is 75% (ie the LGD assigned to senior debt instruments) unless the GSE security satisfies the requirements of footnote 27 in the market risk framework for treatment of the security as a covered bond.

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[2]   Basel Committee on Banking Supervision, *Basel II: International Convergence of Capital Measurement and Capital Standards: a revised framework – comprehensive version*, June 2006, www.bis.org/publ/bcbs128.pdf.

[3]   Basel Committee on Banking Supervision, *Basel III: A global regulatory framework for more resilient banks and banking systems – revised version*, June 2011, www.bis.org/publ/bcbs189.pdf.

1.6 Credit spread risk (securitisations)

Q1.   Within the definition of correlation trading portfolio (CTP), is the definition of securitisation identical to that under the credit risk framework?

Relevant provisions: paragraph 61 of the January 2016 market risk framework.

Answer: Yes, the definition of "securitisation position" is identical to the definition used in the credit risk framework.

Q2.   Paragraph 61 (e) seems to indicate that single names hedging the correlation trading portfolio (CTP) should be categorised and bucketed as CSR – Securitisation CTP, hence netted across the same risk factor, ie same issuer. Paragraph 69 (a) seems to negate this. Please confirm whether hedges to CTP can be netted with CTP at issuer level?

Relevant provisions: paragraphs 61 and 69 of the January 2016 market risk framework.

Answer: As per paragraph 61 (e), instruments that are not securitisation positions and that hedge a position described by paragraphs 61 (a) to 61 (d) are part of the CTP.

Paragraph 69 (a) states that, in the case of index CTP instruments, an index cannot be broken down into its different constituents. That means it should be considered as a risk factor as a whole. Netting with hedges to such index CTP instruments at issuer level is not permitted.

Hedges to non-index CTP can be netted with non-index CTP at issuer level.

Q3.   Paragraph 99 includes $\rho_{kl}^{(tranche)}$, which equals 1 where the two sensitivities within the same bucket are related to the same securitisation tranche, or 40% otherwise. There is no issuer factor. Does this mean that two sensitivities relating to the same issuer but different tranches require 40% correlation?

Relevant provisions: paragraphs 62 and 99 of the January 2016 market risk framework.

Answer: Yes. There is no granularity for issuers in the Delta CSR securitisation part as set out in paragraph 62. Where two tranches have exactly the same issuer, same tenor and same basis, but different tranches (ie different credit quality), the correlation must be 40%.

1.7 Equity risk

Q1.   Banks are required to calculate the "market capitalisation" of a listed entity as the sum of the market capitalisations of the same legal entity or group of legal entities across all stock markets. Given that where an equity position falls (within "large market cap" buckets or "small market cap" buckets) will have different capital implications, please clarify (i) when banks should base their categorisation of equity exposures on entity-level information and when on group-level information; and (ii) how a "group of legal entities" is defined.

Relevant provisions: paragraph 103 of the January 2016 market risk framework.

Answer: The categorisation of a listed entity as "large market cap" or "small market cap" should be based on the market value of the total outstanding shares issued by the listed entity across all stock markets globally.

The reference to "group of legal entities" in paragraph 103 covers cases where the listed entity is a parent company of a group of legal entities. Under no circumstances should the sum of the market capitalisations of multiple related listed entities be used to determine whether a listed entity is "large market cap" or "small market cap".

1.8   Commodity risk

Q1. *How are commodity delta risk factors computed for futures and forward contracts?*

Relevant provisions: paragraph 65 (a) of the January 2016 market risk framework.

Answer: The current prices for futures and forward contracts should be used to compute the commodity delta risk factors. Commodity delta should be allocated to the relevant vertex based on the tenor of the futures and forward contract and given that spot commodity price positions should be slotted into the first vertex (0 years).

Q2. *How are shocks defined for commodity risk factors for the computation of delta and curvature risk? Would such shocks be in absolute or relative terms?*

Relevant provisions: paragraphs 67 (f) and 132 of the January 2016 market risk framework.

Answer: As per paragraph 67 (f), relative shocks would be applied to derive commodity delta. In the case of the curvature risk charge, the curvature risk weights are also relative shifts equal to the delta risk weights.

Q3. *For instruments with commodity spreads as underlying, are the spreads considered a risk factor, or does the instrument have to be decomposed? For example, if there is a swap on the spread between WTI and Brent, will delta on the spread be reported, or will delta of WTI and delta of Brent be reported individually?*

Relevant provisions: paragraphs 115 and 117 of the January 2016 market risk framework.

Answer: Instruments with a spread as their underlying are considered sensitive to different risk factors. In the example cited, the swap will be sensitive to both WTI and Brent, each of which require a capital charge at the risk factor level (ie delta of WTI and delta of Brent). The correlation to aggregate capital charges is specified in paragraph 117.

1.9   Foreign exchange (FX) risk

Q1. *Paragraph 66 (d) states: "No distinction is required between onshore and offshore variants of a currency for all FX delta, vega and curvature risk factors." Does this also apply for deliverable/non-deliverable variants (eg KRO vs KRW, BRO vs BRL, INO vs INR)?*

Relevant provisions: paragraph 66 (d) of the January 2016 market risk framework.

Answer: Yes. No distinction is required between deliverable and non-deliverable variants of a currency.

1.10   Default risk

Q1. *What is the jump-to-default (JTD) equivalent when decomposing multiple underlying positions of a single security or product (eg index options) for purposes of the standardised approach?*

Relevant provisions: paragraphs 138, 142 and 145 of the January 2016 market risk framework.

Answer: The JTD equivalent is defined as the difference between the value of the security or product assuming that each single name referenced by the security or product, separately from the others, defaults

(with zero recovery) and the value of the security or product assuming that none of the names referenced by the security or product default.

Q2.   Are convertible bonds to be treated the same way as vanilla bonds in computing the default risk charge (DRC)?

Relevant provisions: paragraph 145 of the January 2016 market risk framework.

Answer: No. Banks should also consider the P&L of the equity optionality embedded within a convertible bond when computing its DRC. A convertible bond can be decomposed into a vanilla bond and a long equity option. Hence, treating the convertible bond as a vanilla bond will potentially underestimate the jump-to-default risk of the instrument.

Q3.   Paragraph 147 states that for the standardised approach default risk charge, cash equity positions may be attributed a maturity of three months or a maturity of more than one year, at firms' discretion. Such restrictions do not exist in paragraph 186 for the internal models approach, which allows banks discretion to apply a 60-day liquidity horizon for equity sub-portfolios. Furthermore, paragraph 146 states "... the JTD for all exposures of maturity less than one year and their hedges are scaled by a fraction of a year". Given the above-mentioned paragraphs, for purposes of the standardised approach default risk charge, is a bank permitted to assign cash equities and equity derivatives such as index futures any maturity between three months and one year on a sub-portfolio basis in order to avoid broken hedges?

Relevant provisions: paragraphs 146, 147, 148, 149 and 186 of the January 2016 market risk framework.

Answer: No. Such discretion is not permitted in the standardised approach. As required by paragraph 147, cash equity positions are assigned a maturity of either more than one year or three months. There is no discretion permitted to assign cash equity positions to any maturity between three months and one year. In determining the offsetting criterion, paragraph 148 specifies that the maturity of the derivatives contract be considered, not the maturity of the underlying instrument. Paragraph 149 further states that the maturity weighting applied to the JTD for any product with maturity of less than three months is floored at three months.

To illustrate how the standardised approach default risk charge should be calculated with a simple hypothetical portfolio, consider equity index futures with one month to maturity and negative market value of EUR 10 million (EUR –10 million, maturity 1M), hedged with the underlying equity positions with a positive market value of EUR 10 million (EUR +10 million). Both positions in the example should be considered as having a three-month (3M) maturity. Based on paragraph 146, which requires maturity scaling, defined as a fraction of the year, of positions and their hedge, JTD for the above trading portfolio would be calculated as follows: $1/4*10 – 1/4*10 = 0$.

Q4.   In the case where a total return swap (TRS) with a maturity of one month is hedged by the underlying equity, would the bank still need to compute a default risk charge (DRC) if there were sufficient legal terms on the TRS such that there is no settlement risk at swap maturity as the swap is terminated based on the executed price of the stock/bond hedge and any unwind of the TRS can be delayed (beyond the swap maturity date) in the event of hedge disruption until the stock/bond can be liquidated?

Relevant provisions: paragraph 149 of the January 2016 market risk framework.

Answer: The net jump-to-default (JTD) for such a position would be zero. If the contractual/legal terms of the derivative allow for the unwinding of both legs of the position at the time of expiry of the first to mature with no exposure to default risk of the underlying credit beyond that point, then the JTD for the maturity-mismatched position is equal to zero.

2.   Internal models approach (IMA)

2.1   Expected shortfall (ES)

Q2. *To calculate the aggregate capital charge for modellable risk factors (internally modelled capital charge, IMCC) up to 63 daily ES calculations would be necessary if each ES measure were required to be calculated daily. Is it permissible to calculate some of the ES measures weekly or must all measures be calculated daily?*

Relevant provisions: paragraphs 181 and 189 of the January 2016 market risk framework.

Answer: The formula specified in paragraph 189

$$IMCC = \rho\left(IMCC(C)\right) + (1-\rho)\left(\sum_{i=1}^{R} IMCC(C_i)\right)$$

can be rewritten as

$$IMCC = \rho \cdot \left(IMCC(C)\right) + (1-\rho) \cdot \frac{\left(\sum_{i=1}^{R} IMCC(C_i)\right)}{\left(IMCC(C)\right)} \cdot \left(IMCC(C)\right)$$

with $IMCC(C) = ES_{R,S} \cdot \frac{ES_{F,C}}{ES_{R,C}}$.

While $ES_{R,S}$, $ES_{F,C}$ and $ES_{R,C}$ must be calculated daily, it is generally acceptable that the ratio of "undiversified IMCC(C) to diversified IMCC(C)", $\frac{\left(\sum_{i=1}^{R} IMCC(C_i)\right)}{\left(IMCC(C)\right)}$, may be calculated on a weekly basis.

By defining ω as $\omega = \rho + (1-\rho) \cdot \frac{\left(\sum_{i=1}^{R} IMCC(C_i)\right)}{\left(IMCC(C)\right)}$ the formula for the calculation of IMCC can be rearranged, leading to the following expression of IMCC:

$$IMCC = \omega \cdot \left(IMCC(C)\right)$$

Hence, IMCC can be calculated as a multiple of IMCC(C), where IMCC(C) is calculated daily and the multiplier ω is updated weekly.

Banks must have procedures and controls in place to ensure that the weekly calculation of the "undiversified IMCC(C) to diversified IMCC(C)" ratio does not lead to a systematic underestimation of risks relative to daily calculation. Banks must be in a position to switch to daily calculation upon supervisory direction.

Q3.   What indicator must be maximised for the identification of the stressed period?

Relevant provisions: paragraphs 181 (d) and 181 (f) of the January 2016 market risk framework.

Answer: IMCC has to be maximised for the modellable risk factors, which implies that $ES_{r,s}$ is maximised, as noted in paragraph 181 (f).

Q4.   Is it correct that the reduced set of risk factors must explain a minimum of 75% of the variation of the full ES at the group level (ie top level) only and not at the desk level in order to be consistent with the stressed period selection performed at group level?

Relevant provisions: paragraphs 181 (d) and 181 (f) of the January 2016 market risk framework.

Answer: Yes, the reduced set of risk factors must be able to explain a minimum of 75% of the variation of the full ES model at the group level for the aggregate of all desks with IMA model approval.

Q5.   Are the "material changes in the risk factors in the portfolio" referenced in paragraph 181 (f) to be determined at the discretion of the bank or are there more explicit requirements?

Relevant provisions: paragraph 181 (f) of the January 2016 market risk framework.

Answer: Banks should develop policies and procedures to comply with the requirement: "Banks must update their 12-month stressed periods no less than monthly, or whenever there are material changes in the risk factors in the portfolio." Supervisors will assess theoretical concepts developed as well as implementation by banks.

2.2   Liquidity horizons

Q1.   Please clarify the liquidity horizon to be used for equity dividends and equity repo risk factors.

Relevant provisions: paragraph 181 (k) of the January 2016 market risk framework.

Answer: The liquidity horizon for equity large cap repo and dividend risk factors is 20 days. All other equity repo and dividend risk factors are subject to a liquidity horizon of 60 days.

Q2.   For mono-currency and cross-currency basis risk, should liquidity horizons of 10 days and 20 days for interest rate-specified currencies and unspecified currencies, respectively, be applied?

Relevant provisions: paragraph 181 (k) of the January 2016 market risk framework.

Answer: Yes.

Q3.   To which liquidity horizon should inflation risk factors be assigned? Should the liquidity horizon for inflation risk factors be treated consistently with interest rates?

Relevant provisions: paragraph 181 (k) of the January 2016 market risk framework.

Answer: The liquidity horizon for inflation risk factors should be consistent with the liquidity horizons for interest rate risk factors for a given currency.

Q4.　How must a bank treat risk factors in instruments which mature before the liquidity horizon of the respective risk factor prescribed in paragraph 181 (k)?

Relevant provisions: paragraph 181 (k) of the January 2016 market risk framework

Answer: If the maturity of the instrument is shorter than the respective liquidity horizon of the risk factor as prescribed in paragraph 181 (k), the next longer liquidity horizon length (out of the lengths of 10, 20, 40, 60 or 120 days as set out in the paragraph) compared with the maturity of the instrument itself must be used. For example, although the liquidity horizon for interest rate volatility is prescribed as 60 days, if an instrument matures in 30 days, a 40 day liquidity horizon would apply for the instrument's interest rate volatility.

Q5.　Which liquidity horizon should be mapped to multi-sector credit and equity indices (ie where different risk factor categories are involved)?

Relevant provisions: paragraph 181 (k) of the January 2016 market risk framework.

Answer: To determine the liquidity horizon of multi-sector credit and equity indices, the respective liquidity horizons of the underlying instruments must be used. A weighted average of liquidity horizons of the instruments contained the index must be determined by multiplying the liquidity horizon of each individual instrument by its weight in the index (ie the weight used to construct the index) and summing across all instruments. The liquidity horizon of the index is the shortest liquidity horizon (out of 10, 20, 40, 60, 120 days) that is equal to or longer than the weighted average liquidity horizon. For example, if the weighted average liquidity horizon is 12 days, the liquidity horizon of the index would be 20 days.

2.3　Default risk charge

Q1.　Paragraphs 186 (b) and 186 (i) state that correlations must be measured over a liquidity horizon of one year in line with paragraph 186 (e), which states that a bank must assume constant positions over the one-year capital horizon. However, according to paragraph 186 (e), a minimum liquidity horizon of 60 days can be applied to equity sub-portfolios. Should the correlations for equity sub-portfolios be calibrated utilising a 60-day liquidity horizon for consistency?

Relevant provisions: paragraphs 186 (b), 186 (e) and 186 (i) of the January 2016 market risk framework.

Answer: Banks are permitted to calibrate correlations to liquidity horizons of 60 days in the case that a separate calculation is performed for equity sub-portfolios and these desks deal predominately in equity exposures. In the case of a desk with both equity and bond exposures, for which a joint calculation for default risk of equities and bonds needs to be performed, the correlations need to be calibrated to a liquidity horizon of one year.

　　In this case, a bank is permitted to consistently use a 60-day probability of default (PD) for equities and a one-year PD for bonds.

Q2.　Paragraph 186 (b) states, "Default correlations must be based on credit spreads or on listed equity prices." Are banks permitted to also include additional data sources (eg rating time series) in addition to equity prices in order to correct for a correlation bias observed in equity data?

Relevant provisions: paragraph 186 (b) of the January 2016 market risk framework.

Answer: Only credit spreads or listed equity prices are permitted. No additional data sources (eg rating time series) are permitted.

Q3.   Paragraph 186 (b) specifies that banks must use a default simulation model with two types of systematic risk factors. To meet this condition, should the model always have two random variables that correspond to the systematic risk factors?

Relevant provisions: paragraph 186 (b) of the January 2016 market risk framework.

Answer: Yes. Systematic risk in a default risk charge (DRC) model must be accounted for via multiple systematic factors of two different types. The random variable that determines whether an obligor defaults must be an obligor-specific function of the systematic factors of both types and of an idiosyncratic factor. For example, in a Merton-type model, obligor i defaults when its "asset return" X_i falls below an obligor-specific threshold that determines the obligor's probability of default. Systematic risk can be described via M systematic regional factors Y_j^{region} ($j = 1, \dots, M$) and N systematic industry factors $Y_j^{industry}$ ($j = 1, \dots, N$). For each obligor i, region factor loadings $\beta_{i,j}^{region}$ and industry factor loadings $\beta_{i,j}^{industry}$ that describe the sensitivity of the obligor's "asset return" to each systematic factor need to be chosen. There must be at least one non-zero factor loading for the "region" type and at least one non-zero factor loading for the "industry" type. The "asset return" of obligor i can be represented as

$$X_i = \sum_{j=1}^{M} \beta_{i,j}^{region} \cdot Y_j^{region} + \sum_{j=1}^{N} \beta_{i,j}^{industry} \cdot Y_j^{industry} + \gamma_i \cdot \varepsilon_i$$

where ε_i is the idiosyncratic risk factor and γ_i is the idiosyncratic factor loading.

Q4.   Paragraph 186 (e) states that a bank must have constant positions over the chosen liquidity horizon. However, paragraph 186 (j) states that a bank must capture material mismatches between the position and its hedge. Please explain how these two paragraphs are to be consistently applied to securities with a maturity of less than one year.

Relevant provisions: paragraphs 186 (e) and 186 (j) of the January 2016 market risk framework.

Answer: The concept of constant positions has changed in the standard *Minimum capital requirements for market risk* because the capital horizon is now meant to always be synonymous with the new definition of liquidity horizon and no new positions are added when positions expire during the capital horizon. For securities with a maturity under one year, a constant position can be maintained within the liquidity horizon but, much like under the Basel II.5 incremental risk charge (IRC), any maturity of a long or short position must be accounted for when the ability to maintain a constant position within the liquidity horizon cannot be contractually assured.

Q5.   Is a 60-day liquidity horizon permitted to be used for all equity positions? Are banks permitted to use a longer liquidity horizon where appropriate, eg where equity is held to hedge hybrid positions (such as convertibles)?

Relevant provisions: paragraph 186 (b) of the January 2016 market risk framework.

Answer: Yes, banks are permitted to use a 60-day liquidity horizon for all equity positions but are permitted to use a longer liquidity horizon where appropriate.

Q6.   Paragraph 186 (n) indicates that a bank may use a simplified modelling approach for equity derivative positions with multiple underlyings. May a similar simplified approach be used for non-correlation trading portfolio (non-CTP) credit derivative positions with multiple underlyings?

Relevant provisions: paragraph 186 of the January 2016 market risk framework.

Answer: No. The simplified treatment applies only to equity derivatives.

2.4   Backtesting

Q2.   Appendix B.III.a states that "[i]n the case where an outlier can be shown by the firm to relate to a non-modellable risk factor, and the capital requirement for that non-modellable risk factor exceeds the actual or hypothetical loss for that day, it may be disregarded for the purpose of the overall backtesting process if the national supervisor is notified accordingly and does not object to this treatment." Please confirm if this treatment applies to desk-level backtesting exceptions as well. Also, please confirm if the stressed capital add-on (SES) should be compared with the full loss amount or just the excess amount, ie the difference between actual/hypothetical P&L and VaR.

Relevant provisions: Appendix B.III of the January 2016 market risk framework.

Answer: If the backtesting exception at a desk-level test is being driven by a non-modellable risk factor that receives an SES capital charge that is in excess of the maximum of the actual of hypothetical P&L loss for that day, it is permitted to be disregarded for the purposes of the desk-level backtesting. The bank must be able to calculate a non-modellable risk factor capital charge for the specific desk and not only for the respective risk factor across all desks.

        For example, if the P&L for a desk is EUR –1.5 million and VaR is EUR 1 million, a non-modellable risk factor capital charge (at desk level) of EUR 0.8 million would not be sufficient to disregard an exception for the purpose of desk-level backtesting. The non-modellable risk factor capital charge attributed to the standalone desk level (without VaR) must be greater than the loss of EUR 1.5 million in order to disregard an exception for the purpose of desk-level backtesting.

2.5   P&L attribution

Q1.   In the event trading desks of a bank operate in different time zones compared to the location of the bank's risk control department, data for risk modelling could be retrieved at different snapshot times compared to the data on which the desks' front office P&L is based. Are banks permitted to align risk-theoretical P&L and hypothetical P&L in terms of data snapshot times for these desks?

Relevant provisions: paragraph 183 (b) and Appendix B.II of the January 2016 market risk framework.

Answer: Banks are permitted to align the snapshot time used for the calculation of the risk-theoretical P&L of a desk to the snapshot time used for the derivation of its hypothetical P&L.

Q2.   For the purposes of determining hypothetical P&L (HPL) for backtesting and for P&L attribution, are all valuation adjustments to be excluded from the analysis? That is, what types of valuation adjustments must be excluded from HPL?

Relevant provisions: paragraph 189 and footnote 44 of the January 2016 market risk framework.

Answer: Banks should not include any valuation adjustments that are updated at a less than daily frequency in their measure of HPL for the purpose of desk-level backtesting and P&L attribution. In addition, banks should not include credit valuation adjustments (CVA), debit valuation adjustments (DVA) or other valuation adjustments (XVA) or bid-ask spreads in their HPL for desk-level backtesting and P&L attribution.

In addition, banks are expected to measure their HPL, including valuation adjustments measured less frequently than daily (but not CVA, DVA, XVA or bid-ask spreads), for each desk, and report this to the supervisor. At a later date, the Committee will articulate whether additional valuation adjustments should be included in HPL for purposes of desk-level backtesting and P&L attribution tests.

2.6   IMA eligibility

Q1.   The first step of the model approval process is an overall assessment of a bank's firm-wide internal risk capital model based on both qualitative and quantitative requirements. Does the use of the term "firm-wide" include a group of trading desks to be nominated as in-scope for model approval?

Relevant provisions: paragraph 183 (a) of the January 2016 market risk framework.

Answer: The term "firm-wide" is defined as pertaining to the group of trading desks that the bank nominates as in-scope in their application for the IMA.

Q2.   As securitisations are out of scope for the IMA, are banks required to segregate desks to ensure securitisation and non-securitisation products reside in different trading desks? If not, how should banks test model eligibility?

Relevant provisions: paragraph 183 (c) of the January 2016 market risk framework.

Answer: Securitisation positions are out of scope for IMA regulatory capital treatment, and as a result they are not taken into account for the model eligibility tests. This implies that banks are not allowed to include securitisations in trading desks for which they determine market risk capital requirements using the IMA. Securitisations must be included in trading desks for which capital requirements are determined using the standardised approach. Banks are allowed to also include hedging instruments in trading desks which include securitisations and are capitalised using the standardised approach.

2.7   Non-modellable risk factors (NMRFs)

Q1.   What is the definition of a "committed quote" as referenced in paragraph 183 (c)?

Relevant provisions: paragraph 183 (c) of the January 2016 market risk framework.

Answer: A committed quote is a price from an arm's length provider at which the provider of the quote must buy or sell the financial instrument.

Q2.   Are banks permitted to use a zero correlation assumption beyond idiosyncratic credit spread risks?

Relevant provisions: paragraph 190 of the January 2016 market risk framework.

Answer: No. A zero correlation assumption for NMRF capital aggregation is not permitted for idiosyncratic equity risk.

Q3.   Are banks permitted to not capitalise certain risks or risk factors via ES or SES (as appropriate) as long as those risks or risk factors are not included in the model eligibility tests?

Relevant provisions: paragraph 187 of the January 2016 market risk framework.

Answer: Banks design their own models for use under the IMA. As a result, they may exclude risk factors from IMA models as long as the bank's supervisor does not conclude that the risk factor must be capitalised by either ES or SES. Moreover, at a minimum, the risk factors defined in paragraph 185 need to be covered in the IMA. If a risk factor is capitalised by neither ES nor SES, it is to be excluded from the calculation of risk theoretical P&L (RTPL).

Q4.   Are all transactions and eligible committed quotes valid as real price observations, regardless of size?

Relevant provisions: paragraph 183 (c) of the January 2016 market risk framework.

Answer: Orderly transactions and eligible committed quotes with a non-negligible volume, as compared to usual transaction sizes for the bank, reflective of normal market conditions can be generally accepted as valid.

3.   Trading book boundary and scope of application

3.1   Trading book instruments

Q1.   May instruments designated under "fair value option" be allocated to the trading book?

Relevant provisions: paragraph 11 of the January 2016 market risk framework.

Answer: Instruments designated under "fair value option" may be allocated to the trading book, but only if they comply with all the relevant requirements for trading book instruments set out in Section A of the market risk framework.

Q2.   If an instrument is reclassified for accounting purposes (eg reclassification to accounting trading assets or liabilities through the P&L), an automatic prudential switch may be necessary given the requirements set out in paragraphs 12 and 16 (a). In this situation, does paragraph 28 (regarding an additional Pillar 1 capital charge) apply?

Relevant provisions: paragraphs 12, 16 and 28 of the January 2016 market risk framework.

Answer: The disallowance of capital benefits as a result of switching positions from one book to another applies "without exception" and "in any case or circumstance". It is therefore independent of whether the switch has been made at the discretion of the bank or is beyond its control, eg in the case of the delisting of an equity.

Q3. What are the operational calculation and frequency for determining instruments giving rise to "net short" equity or credit positions in the banking book?

Relevant provisions: paragraph 13 (c) of the January 2016 market risk framework.

Answer: Banks should continuously manage and monitor their banking book positions to ensure that any instrument that individually has the potential to create a net short credit or equity position in the banking book is not actually creating a non-negligible net short position at any point in time.

Q4.   Does the reference "instruments resulting from underwriting commitments" in paragraph 13 (d) cover (a) off-balance sheet unused commitment items arising out of a firm/hard underwriting commitment (reflecting the guarantee to purchase all securities offered for sale) if such a commitment is classified as an instrument from the accounting standpoint, and (b) loan syndication commitments?

Relevant provisions: paragraph 13 (d) of the January 2016 market risk framework.

Answer: "Underwriting commitment" in the context of paragraph 13 (d) refers only to securities underwriting, and relates only to securities that are expected to be actually purchased on the settlement date.

Q5.   Based on paragraphs 13 (d) and 15 (d), are retail and SME lending commitments excluded from the trading book?

Relevant provisions: paragraphs 13 (d) and 15 (d) of the January 2016 market risk framework.

Answer: Yes. Retail and SME lending commitments are excluded from the trading book.

Q6.   What does the term "real estate holdings" mean in the context of paragraph 15 (instruments that must be in the banking book)? Is it restricted to direct holdings of real estate or could it for instance also include investments in real estate investment companies?

Relevant provisions: paragraph 15 (c) of the January 2016 market risk framework.

Answer: "Real estate holdings" in the context of paragraph 15 (c) relates only to direct holdings of real estate as well as derivatives on direct holdings.

Q7.   What is the definition of "trading-related repo-style transactions"?

Relevant provisions: paragraph 16 (e) of the January 2016 market risk framework.

Answer: Trading-related repo-style transactions comprise those entered into for the purposes of market-making, locking in arbitrage profits or creating short credit or equity positions.

Q8.   How should a bank treat the bifurcation of embedded derivatives per paragraph 16 (f)?

Relevant provisions: paragraph 16 (f) of the January 2016 market risk framework.

Answer: Liabilities issued out of the bank's own banking book that contain embedded derivatives and thereby meet the criteria of paragraph 16 (f) should be bifurcated.

This means that banks should split the liability into two components: (i) the embedded derivative, which is assigned to the trading book; and (ii) the residual liability, which is retained in the banking book. No internal risk transfers are necessary for this bifurcation.

Likewise, where such a liability is unwound, or where an embedded option is exercised, both the trading and banking book components are conceptually unwound simultaneously and instantly retired; no transfers between trading and banking book are necessary.

Q9.   To which book must an FX option be assigned if it hedges the FX risk of a banking book position?

Relevant provisions: paragraph 16 (f) of the January 2016 market risk framework.

Answer: An option that manages FX risk in the banking book is covered by the presumptive list of trading book instruments included in paragraph 16 (f). Only with explicit supervisory approval may a bank include in its banking book an option that manages banking book FX risk.

Q10.   Does the reference in paragraph 16 (f) to options that relate to credit or equity risk include floors to an equity-linked bond?

Relevant provisions: paragraph 16 (f) of the January 2016 market risk framework.

Answer: Yes. A floor to an equity-linked bond is an embedded option with an equity as part of the underlying, and therefore the embedded option should be bifurcated and included in the trading book.

3.2   Movement of instruments between the trading book and banking book

Q1.   Does the term "change in accounting standards" in paragraph 27 mean a change in the accounting standards themselves or a reclassification within the current accounting standards?

Relevant provisions: paragraph 27 of the January 2016 market risk framework.

Answer: In the context of paragraph 27, "change in accounting standards" refers to the accounting standards themselves changing, rather than the accounting classification of an instrument changing.

*Q2.		Does the treatment specified for internal risk transfers apply only to risk transfers done via internal derivatives trades, or does it apply to transfer of securities internally at market value as well?*

Relevant provisions: paragraph 29 of the January 2016 market risk framework.

Answer: The treatment specified for internal risk transfers applies only to risk transfers done via internal derivatives trades. The reallocation of securities between trading and banking book should be considered a re-designation of securities and is governed by paragraph 29.

*Q3.		Where a banking book business buys securities from an internal trading desk (as opposed to from an external seller), and the securities, once transferred to the banking book business, qualify for AFS accounting treatment instead of MTM/held for trading, is this a re-designation per paragraph 29?*

Relevant provisions: paragraph 29 of the January 2016 market risk framework.

Answer: Any reallocation of securities between trading and banking book, including outright sales at arm's length, should be considered a re-designation of securities and is governed by paragraph 29.

## 3.3	Internal risk transfers

*Q1.		Paragraphs 34 (a) and 35 (a) state that internal risk transfers of credit and equity exposures from banking book to trading book must be offset with "an external hedge from an eligible third-party protection provider that exactly matches the internal risk transfer" to be excluded from the trading book treatment. May the external hedge be with one or multiple counterparties, as long as the aggregated hedge is exactly matched with the internal risk transferred?*

Relevant provisions: paragraphs 34 (a) and 35 (a) of the January 2016 market risk framework.

Answer: Yes. External hedges for the purposes of paragraphs 34 (a) and 35 (a) can be made up of multiple transactions with multiple counterparties as long as the aggregate external hedge exactly matches the internal risk transfer, and the internal risk transfer exactly matches the aggregate external hedge.

*Q2.		Would FX and commodity risk, arising from CVA hedges that are eligible under the CVA standard, also be excluded from the bank's market risk capital requirements calculation?*

Relevant provisions: paragraph 39 of the January 2016 market risk framework.

Answer: Yes.