

Saudi Arabian Monetary Agency

Banking Supervision Dept.

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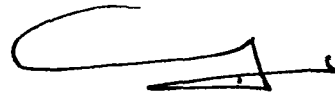
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From : Saudi Arabian Monetary Agency
To : All Banks
Attention : Managing Directors, Chief Executive Officers and General Managers
Subject : Revision to Basel II Market Risk Framework – updated as of 31 December 2010

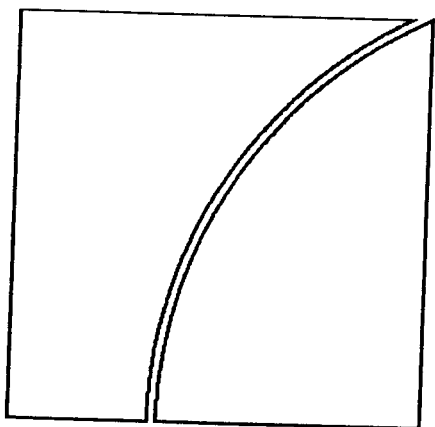
The Agency refers to its circular number BCS 559 of 26 December 2009 covering a Basel Committee on Banking Supervision (BCBS) paper entitled "July 2009 – Basel II Market Risk Framework". In February 2011, the BCBS has issued an updated document relating to this subject.

The Agency recommends that all Banks currently engaged in implementing Basel II in Saudi Arabia should ensure that their relevant staff involved in the implementation of the Basel framework are fully aware of this paper and are taking appropriate actions to benefit from these standards. Bank staff in other areas such as Risk Management, Financial Controls, and Internal Audits should also be familiar with this paper. Over the next few month, the Agency will, where appropriate, update its guidance documents following which banks will be expected to implement the changes. These documents should be accessed from the Bank for International Settlement website address: (<http://www.bis.org>).



Dr. Abdulrahman Al-Hamidy
Vice Governor

Basel Committee on Banking Supervision



Revisions to the Basel II market risk framework

Updated as of 31 December 2010.

February 2011

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BANK FOR INTERNATIONAL SETTLEMENTS

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Revisions to the Basel II market risk framework

Updated as of 31 December 2010 to reflect the adjustments to the Basel II market risk framework announced by the Basel Committee in its 18 June 2010 press release and the stress testing guidance for the correlation trading portfolio referred to in paragraph 9 of the July 2009 version of this document. Changes introduced by the Basel III framework are not yet reflected in the text.

1. Since the financial crisis began in mid-2007, an important source of losses and of the build up of leverage occurred in the trading book. A main contributing factor was that the current capital framework for market risk, based on the 1996 *Amendment to the Capital Accord to incorporate market risks*, does not capture some key risks. In response, the Basel Committee on Banking Supervision ("the Committee")¹ supplements the current value-at-risk-based trading book framework with an incremental risk capital charge, which includes default risk as well as migration risk, for unsecuritised credit products. For securitised products, the capital charges of the banking book will apply with a limited exception for certain so-called correlation trading activities, where banks may be allowed by their supervisor to calculate a comprehensive risk capital charge subject to strict qualitative minimum requirements as well as stress testing requirements. These measures will reduce the incentive for regulatory arbitrage between the banking and trading books.

2. An additional response to the crisis is the introduction of a stressed value-at-risk requirement. Losses in most banks' trading books during the financial crisis have been significantly higher than the minimum capital requirements under the former Pillar 1 market risk rules. The Committee therefore requires banks to calculate a stressed value-at-risk taking into account a one-year observation period relating to significant losses, which must be calculated in addition to the value-at-risk based on the most recent one-year observation period. The additional stressed value-at-risk requirement will also help reduce the procyclicality of the minimum capital requirements for market risk.

I. Background and objectives

3. The Basel Committee/IOSCO Agreement reached in July 2005² contained several improvements to the capital regime for trading book positions. Among the revisions was a new requirement for banks that model specific risk to measure and hold capital against default risk that is incremental to any default risk captured in the bank's value-at-risk model. The incremental default risk charge was incorporated into the trading book capital regime in response to the increasing amount of exposure in banks' trading books to credit-risk related and often illiquid products whose risk is not reflected in value-at-risk. At its meeting in March

¹ The Basel Committee on Banking Supervision consists of senior representatives of bank supervisory authorities and central banks from Argentina, Australia, Belgium, Brazil, Canada, China, France, Germany, Hong Kong SAR, India, Indonesia, Italy, Japan, Korea, Luxembourg, Mexico, the Netherlands, Russia, Saudi Arabia, Singapore, South Africa, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. It usually meets at the Bank for International Settlements (BIS) in Basel, Switzerland, where its permanent Secretariat is located.

² Basel Committee on Banking Supervision, *The Application of Basel II to trading activities and the treatment of double default effects*, July 2005.

10-day value-at-risk estimate will be subject to the same multiplier as for general market risk. The separate surcharge for specific risk under the current framework⁶ will be eliminated.

8. The Committee has decided that the incremental risk capital charge should capture not only default risk but also migration risk. This decision is reflected in the proposed revisions to the Basel II market risk framework. Additional guidance on the incremental risk capital charge is provided in a separate document, the *Guidelines for computing capital for incremental risk in the trading book* (referred to as "the Guidelines").⁷

9. The Committee as a whole has not yet agreed that currently existing methodologies used by banks adequately capture incremental risks of all securitised products. Until the Committee can be satisfied that a methodology adequately captures incremental risks for all securitised products, the capital charges of the standardised measurement method will in general be applied to these products. However, there will be a limited exception for certain correlation trading activities, where banks may be allowed by their supervisor to calculate a comprehensive risk capital charge subject to strict minimum requirements. In particular, for a bank to apply this exception it must regularly apply a set of specific, predetermined stress scenarios to the portfolio that receives internal model regulatory capital treatment. The precise number and composition of stress scenarios to be applied is outlined in the Annex to this document. Furthermore, the comprehensive risk capital charge is subject to a floor expressed as a percentage of the charge applicable under the standardised measurement method.

10. The improvements in the Basel II Framework concerning internal value-at-risk models in particular require banks to justify any factors used in pricing which are left out in the calculation of value-at-risk. They will also be required to use hypothetical backtesting at least for validation, to update market data at least monthly and to be in a position to update it in a more timely fashion if deemed necessary. Furthermore, the Committee clarifies that it is permissible to use a weighting scheme for historical data that is not fully consistent with the requirement that the "effective" observation period must be at least one year, as long as that method results in a capital charge at least as conservative as that calculated with an "effective" observation period of at least one year.

11. To complement the incremental risk capital framework, the Committee extends the scope of the prudent valuation guidance to all positions subject to fair value accounting and make the language more consistent with existing accounting guidance. The Committee clarifies that regulators retain the ability to require adjustments to current value beyond those required by financial reporting standards, in particular where there is uncertainty around the current realisable value of a position due to illiquidity. This guidance focuses on the current valuation of the position and is a separate concern from the risk that market conditions and/or variables will change before the position is liquidated (or closed out) causing a loss of value to positions held.

12. (deleted)

⁶ Basel Committee on Banking Supervision, *Modification of the Basle Capital Accord of July 1988, as amended in January 1996*, press release, 19 September 1997.

⁷ Basel Committee on Banking Supervision, *Guidelines for computing capital for incremental risk in the trading book*, July 2009.

portfolio. Positions which reference a claim on a special purpose entity are not included either. A bank may also include in the correlation trading portfolio positions that hedge the positions described above and which are neither securitisation exposures nor n-th-to-default credit derivatives and where a liquid two-way market as described above exists for the instrument or its underlyings.

16. Paragraph 709(ii) of the Basel II Framework will be changed as follows, and a new paragraph 709(ii-1-) will be introduced. Changed and new wording is underlined.

709(ii). The minimum capital requirement is expressed in terms of two separately calculated charges, one applying to the "specific risk" of each security, whether it is a short or a long position, and the other to the interest rate risk in the portfolio (termed "general market risk") where long and short positions in different securities or instruments can be offset. The bank must, however, determine the specific risk capital charge for the correlation trading portfolio as follows: The bank computes (i) the total specific risk capital charges that would apply just to the net long positions from the net long correlation trading exposures combined, and (ii) the total specific risk capital charges that would apply just to the net short positions from the net short correlation trading exposures combined. The larger of these total amounts is then the specific risk capital charge for the correlation trading portfolio.

709(ii-1-). During a transitional period until 31 December 2013, the bank may exclude positions in securitisation instruments which are not included in the correlation trading portfolio from the calculation according to paragraph 709(ii) and determine the specific risk capital charge as follows: The bank computes (i) the total specific risk capital charge that would apply just to the net long positions in securitisation instruments in the trading book, and (ii) the total specific risk capital charge that would apply just to the net short positions in securitisation instruments in the trading book. The larger of these total amounts is then the specific risk capital charge for the securitisation positions in the trading book. This calculation must be undertaken separately from the calculation for the correlation trading portfolio.

17. Paragraph 712(ii) of the Basel II Framework will be changed as follows. Deleted wording is struck out.

712(ii). However, since this may in certain cases considerably underestimate the specific risk for debt instruments which have a high yield to redemption relative to government debt securities, each national supervisor will have the discretion:

- To apply a higher specific risk charge to such instruments; and/or
- To disallow offsetting for the purposes of defining the extent of general market risk between such instruments and any other debt instruments.

~~In that respect, securitisation exposures that would be subject to a deduction treatment under the securitisation framework set forth in this Framework (e.g. equity tranches that absorb first loss), as well as securitisation exposures that are unrated liquidity lines or letters of credit should be subject to a capital charge that is no less than the charge set forth in the securitisation framework.~~

18. After paragraph 712(ii) of the Basel II Framework, the treatment of specific risk will be amended as follows:

Specific risk capital charges based on external credit ratings

External rating (illustrative)	Securitisation exposures			Resecuritisation exposures	
	Senior, granular	Non-senior, granular	Non- granular	Senior	Non-senior
AAA/A-1/P-1	0.56%	0.96%	1.60%	1.60%	2.40%
AA	0.64%	1.20%	2.00%	2.00%	3.20%
A+	0.80%	1.44%	2.80%	2.80%	4.00%
A/A-2/P-2	0.96%	1.60%		3.20%	5.20%
A-	1.60%	2.80%		4.80%	8.00%
BBB+	2.80%	4.00%		8.00%	12.00%
BBB/A-3/P-3	4.80%	6.00%		12.00%	18.00%
BBB-	8.00%			16.00%	28.00%
BB+	20.00%			24.00%	40.00%
BB	34.00%			40.00%	52.00%
BB-	52.00%			60.00%	68.00%
Below BB-/ A-3/P-3	Deduction				

712(vi). The specific risk capital charges for unrated positions covered under the securitisation framework as defined in paragraphs 538 to 542 will be calculated as set out below, subject to supervisory approval.

- (a) If a bank has approval for the internal ratings-based approach for the asset classes which include the underlying exposures, the bank may apply the supervisory formula approach (paragraphs 623 to 636). When estimating PDs and LGDs for calculating K_{IRB} , the bank must meet the minimum requirements for the IRB approach.
- (b) To the extent that a bank has approval to apply the internally developed approach referred to in paragraph 718(Lxxxvii-1-) to the underlying exposures and the bank derives estimates for PDs and LGDs from the internally developed approach specified in paragraphs 718(xcii) and 718(xciii) that are in line with the quantitative standards for the internal ratings-based approach, the bank may use these estimates for calculating K_{IRB} and, consequently, for applying the supervisory formula approach (paragraphs 623 to 636).
- (c) In all other cases the capital charge can be calculated as 8% of the weighted-average risk weight that would be applied to the securitised exposures under the standardised approach, multiplied by a concentration ratio. If the concentration ratio is 12.5 or higher the position has to be deducted from capital as defined in paragraph 561. This concentration ratio is equal to the sum of the nominal amounts of all the tranches divided by the sum of the nominal amounts of the tranches junior to or pari passu with the tranche in which the position is held including that tranche itself.

20. Paragraph 718(xxi) with regard to the specific risk capital charge for equities of the Basel II Framework will be changed as follows. Changed wording is underlined.

718(xxi). The capital charge for specific risk and for general market risk will each be 8%, ~~unless the portfolio is both liquid and well diversified, in which case the charge will be 4%. Given the different characteristics of national markets in terms of marketability and concentration, national authorities will have discretion to determine the criteria for liquid and diversified portfolios. The general market risk charge will be 8%.~~

V. Changes to the internal models approach to market risk

21. Section VI.D of Part 2 of the Basel II Framework outlining the internal models approach to market risk will be changed as follows. Changed wording is underlined. The original footnote numbers of the Basel II Framework are provided in brackets.

1. General criteria

718(Lxx). The use of an internal model will be conditional upon the explicit approval of the bank's supervisory authority. Home and host country supervisory authorities of banks that carry out material trading activities in multiple jurisdictions intend to work co-operatively to ensure an efficient approval process.

718(Lxxi). The supervisory authority will only give its approval if at a minimum:

- It is satisfied that the bank's risk management system is conceptually sound and is implemented with integrity;
- The bank has in the supervisory authority's view sufficient numbers of staff skilled in the use of sophisticated models not only in the trading area but also in the risk control, audit, and if necessary, back office areas;
- The bank's models have in the supervisory authority's judgement a proven track record of reasonable accuracy in measuring risk;
- The bank regularly conducts stress tests along the lines discussed in paragraphs 718(Lxxvii) to 718(Lxxxiv) below.

718(Lxxii). Supervisory authorities will have the right to insist on a period of initial monitoring and live testing of a bank's internal model before it is used for supervisory capital purposes.

718(Lxxiii). In addition to these general criteria, banks using internal models for capital purposes will be subject to the requirements detailed in paragraphs 718(Lxxiv) to 718(xcix).

2. Qualitative standards

718(Lxxiv). It is important that supervisory authorities are able to assure themselves that banks using models have market risk management systems that are conceptually sound and implemented with integrity. Accordingly, the supervisory authority will specify a number of *qualitative criteria* that banks would have to meet before they are permitted to use a models-based approach. The extent to which banks meet the qualitative criteria may influence the level at which supervisory

- (h) Banks should have a routine in place for ensuring compliance with a documented set of internal policies, controls and procedures concerning the operation of the risk measurement system. The bank's risk measurement system must be well documented, for example, through a risk management manual that describes the basic principles of the risk management system and that provides an explanation of the empirical techniques used to measure market risk.
- (i) An independent review of the risk measurement system should be carried out regularly in the bank's own internal auditing process. This review should include both the activities of the business trading units and of the independent risk control unit. A review of the overall risk management process should take place at regular intervals (ideally not less than once a year) and should specifically address, at a minimum:
 - The adequacy of the documentation of the risk management system and process;
 - The organisation of the risk control unit;
 - The integration of market risk measures into daily risk management;
 - The approval process for risk pricing models and valuation systems used by front and back-office personnel;
 - The validation of any significant change in the risk measurement process;
 - The scope of market risks captured by the risk measurement model;
 - The integrity of the management information system;
 - The accuracy and completeness of position data;
 - The verification of the consistency, timeliness and reliability of data sources used to run internal models, including the independence of such data sources;
 - The accuracy and appropriateness of volatility and correlation assumptions;
 - The accuracy of valuation and risk transformation calculations;
 - The verification of the model's accuracy through frequent back-testing as described in 718(Lxxiv) (b) above and in the accompanying document: *Supervisory framework for the use of backtesting in conjunction with the internal models approach to market risk capital requirements*.

3. **Specification of market risk factors**

718(Lxxv). An important part of a bank's internal market risk measurement system is the specification of an appropriate set of market risk factors, i.e. the market rates and prices that affect the value of the bank's trading positions. The risk factors contained in a market risk measurement system should be sufficient to capture the risks inherent in the bank's portfolio of on- and off-balance sheet trading positions. Although banks will have some discretion in specifying the risk factors for their internal models, the following guidelines should be fulfilled.

- At a minimum, there should be a risk factor that is designed to capture market-wide movements in equity prices (e.g. a market index). Positions in individual securities or in sector indices could be expressed in "beta-equivalents"¹¹ relative to this market-wide index;
 - A somewhat more detailed approach would be to have risk factors corresponding to various sectors of the overall equity market (for instance, industry sectors or cyclical and non-cyclical sectors). As above, positions in individual stocks within each sector could be expressed in beta-equivalents⁴⁹ relative to the sector index;
 - The most extensive approach would be to have risk factors corresponding to the volatility of individual equity issues.
 - The sophistication and nature of the modelling technique for a given market should correspond to the bank's exposure to the overall market as well as its concentration in individual equity issues in that market.
- (e) For commodity prices, there should be risk factors corresponding to each of the commodity markets in which the bank holds significant positions (also see paragraph 718(xlvii) above):
- For banks with relatively limited positions in commodity-based instruments, a straightforward specification of risk factors would be acceptable. Such a specification would likely entail one risk factor for each commodity price to which the bank is exposed. In cases where the aggregate positions are quite small, it might be acceptable to use a single risk factor for a relatively broad sub-category of commodities (for instance, a single risk factor for all types of oil);
 - For more active trading, the model must also take account of variation in the "convenience yield"¹² between derivatives positions such as forwards and swaps and cash positions in the commodity.

4. Quantitative standards

718(Lxxvi). 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) "Value-at-risk" must be computed on a daily basis.
- (b) In calculating the value-at-risk, a 99th percentile, one-tailed confidence interval is to be used.

¹¹ [162] A "beta-equivalent" position would be calculated from a market model of equity price returns (such as the CAPM model) by regressing the return on the individual stock or sector index on the risk-free rate of return and the return on the market index.

¹² [163] The convenience yield reflects the benefits from direct ownership of the physical commodity (for example, the ability to profit from temporary market shortages), and is affected both by market conditions and by factors such as physical storage costs.

volatilities. This means that banks should measure the volatilities of options positions broken down by different maturities.

- (i) In addition, a bank must calculate a 'stressed value-at-risk' measure. This measure is intended to replicate a value-at-risk calculation that would be generated on the bank's current portfolio if the relevant market factors were experiencing a period of stress; and should therefore be based on the 10-day, 99th percentile, one-tailed confidence interval value-at-risk measure of the current portfolio, with model inputs calibrated to historical data from a continuous 12-month period of significant financial stress relevant to the bank's portfolio. The period used must be approved by the supervisor and regularly reviewed. As an example, for many portfolios, a 12-month period relating to significant losses in 2007/2008 would adequately reflect a period of such stress; although other periods relevant to the current portfolio must be considered by the bank.
- (j) As no particular model is prescribed under paragraph (f) above, different techniques might need to be used to translate the model used for value-at-risk into one that delivers a stressed value-at-risk. For example, banks should consider applying anti-thetic¹⁴ data, or applying absolute rather than relative volatilities to deliver an appropriate stressed value-at-risk. The stressed value-at-risk should be calculated at least weekly.
- (k) Each bank must meet, on a daily basis, a capital requirement expressed as the sum of:
 - The higher of (1i) its previous day's value-at-risk number measured according to the parameters specified in this section (VaR_{t-1}); and (2ii) an average of the daily value-at-risk measures on each of the preceding sixty business days (VaR_{avg}), multiplied by a multiplication factor (m_c);
 - plus-
 - The higher of (1) its latest available stressed-value-at-risk number calculated according to (i) above ($sVaR_{t-1}$); and (2) an average of the stressed value-at-risk numbers calculated according to (i) above over the preceding sixty business days ($sVaR_{avg}$), multiplied by a multiplication factor (m_s).

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

$$c = \max\{VaR_{t-1}; m_c \cdot VaR_{avg}\} + \max\{sVaR_{t-1}; m_s \cdot sVaR_{avg}\}$$

- (l) The multiplication factors m_c and m_s will be set by individual supervisory authorities on the basis of their assessment of the quality of the bank's risk management system, subject to an absolute minimum of 3 for m_c and an absolute minimum of 3 for m_s . Banks will be required to add to these factors a "plus" directly related to the ex-post performance of the model, thereby introducing a built-in positive incentive to maintain the predictive quality of the model. The plus will range from 0 to 1 based on the outcome of so-called "backtesting." The backtesting results applicable for calculating the plus are

¹⁴ Firms should consider modelling valuation changes that are based on the magnitude of historic price movements, applied in both directions – irrespective of the direction of the historic movement.

(ii) *Scenarios requiring a simulation by the bank*

718(Lxxxii). Banks should subject their portfolios to a series of simulated stress scenarios and provide supervisory authorities with the results. These scenarios could include testing the current portfolio against past periods of significant disturbance, for example, the 1987 equity crash, the Exchange Rate Mechanism (ERM) crises of 1992 and 1993, the fall in bond markets in the first quarter of 1994, the 1998 Russian financial crisis, the 2000 bursting of the technology stock bubble or the 2007/2008 sub-prime crisis, incorporating both the large price movements and the sharp reduction in liquidity associated with these events. A second type of scenario would evaluate the sensitivity of the bank's market risk exposure to changes in the assumptions about volatilities and correlations. Applying this test would require an evaluation of the historical range of variation for volatilities and correlations and evaluation of the bank's current positions against the extreme values of the historical range. Due consideration should be given to the sharp variation that at times has occurred in a matter of days in periods of significant market disturbance. ~~The 1987 equity crash, the suspension of the ERM, or the fall in bond markets in the first quarter of 1994, for~~ For example, the above-mentioned situations involved correlations within risk factors approaching the extreme values of 1 or -1 for several days at the height of the disturbance.

(iii) *Scenarios developed by the bank itself to capture the specific characteristics of its portfolio.*

718(Lxxxiii). In addition to the scenarios prescribed by supervisory authorities under paragraphs 718(Lxxxi) and 718(Lxxxii) above, a bank should also develop its own stress tests which it identifies as most adverse based on the characteristics of its portfolio (e.g. problems in a key region of the world combined with a sharp move in oil prices). Banks should provide supervisory authorities with a description of the methodology used to identify and carry out the scenarios as well as with a description of the results derived from these scenarios.

718(Lxxxiv). The results should be reviewed periodically by senior management and should be reflected in the policies and limits set by management and the board of directors. Moreover, if the testing reveals particular vulnerability to a given set of circumstances, the national authorities would expect the bank to take prompt steps to manage those risks appropriately (e.g. by hedging against that outcome or reducing the size of its exposures).

6. External validation

718(Lxxxv). The validation of models' accuracy by external auditors and/or supervisory authorities should at a minimum include the following steps:

- (a) Verifying that the *internal validation processes* described in paragraph 718(Lxxiv) (i) are operating in a satisfactory manner;
- (b) Ensuring that the *formulae* used in the calculation process as well as for the pricing of options and other complex instruments are validated by a qualified unit, which in all cases should be independent from the trading area;
- (c) Checking that the *structure* of internal models is adequate with respect to the bank's activities and geographical coverage;

8. *Treatment of specific risk*

718(Lxxxvii). Where a bank has a VaR measure that incorporates specific risk from equity risk positions and where the supervisor has determined that the bank meets all the qualitative and quantitative requirements for general market risk models, as well as the additional criteria and requirements set out in paragraphs 718(Lxxxviii) to 718(xci-2-) below, the bank is not required to subject its equity positions to the capital charge according to the standardised measurement method as specified in paragraphs 718(xix) to 718(xxviii). ~~it may base its charge on modelled estimates, provided the measure is based on models that meet the additional criteria and requirements set out below. Banks which are unable to meet these additional criteria and requirements will be required to base their specific risk capital charge on the full amount of the specific risk charge calculated under the standardised method.~~

718(Lxxxvii-1-). For interest rate risk positions other than securitisation exposures and n-th-to-default credit derivatives, the bank will not be required to subject these positions to the standardised capital charge for specific risk, as specified in paragraphs 709(ii) to 718, when all of the following conditions hold:

- (a) The bank has a value-at-risk measure that incorporates specific risk and the supervisor has determined that the bank meets all the qualitative and quantitative requirements for general market risk models, as well as the additional criteria and requirements set out in paragraphs 718(Lxxxviii) to 718(xci-2-) below; and
- (b) The supervisor is satisfied that the bank's internally developed approach adequately captures incremental default and migration risks for positions subject to specific interest rate risk according to the standards laid out in paragraphs 718(xcii) and 718(xciii) below.

The bank is allowed to include its securitisation exposures and n-th-to-default credit derivatives in its value-at-risk measure. Notwithstanding, it is still required to hold additional capital for these products according to the standardised measurement methodology, with the exceptions noted in paragraphs 718(xcv) to 718(xcviii) below.

718(Lxxxviii). The criteria for supervisory recognition of banks' modelling of specific risk require that a bank's model must capture all material components of price risk¹⁶ and be responsive to changes in market conditions and compositions of portfolios. In particular, the model must:

- explain the historical price variation in the portfolio;¹⁷
- capture concentrations (magnitude and changes in composition);¹⁸

¹⁶ Banks need not capture default and migration risks for positions subject to the incremental risk capital charge referred to in paragraphs 718(xcii) and 718(xciii).

¹⁷ [165] The key ex ante measures of model quality are "goodness-of-fit" measures which address the question of how much of the historical variation in price value is explained by the risk factors included within the model. One measure of this type which can often be used is an R-squared measure from regression methodology. If this measure is to be used, the risk factors included in the bank's model would be expected to be able to explain a high percentage, such as 90%, of the historical price variation or the model should explicitly include estimates of the residual variability not captured in the factors included in this regression. For some types of models, it may not be feasible to calculate a goodness-of-fit measure. In such instance, a bank is expected to work with its national supervisor to define an acceptable alternative measure which would meet this regulatory objective.

incorporate specific risk are "unacceptable" if the results at the sub-portfolio level produce a number of exceptions commensurate with the *Red Zone* as defined in Annex 10a of this Framework. Banks with "unacceptable" specific risk models are expected to take immediate action to correct the problem in the model and to ensure that there is a sufficient capital buffer to absorb the risk that the backtest showed had not been adequately captured.

718(xcii). In addition, the bank must have an approach in place to capture in its regulatory capital default risk and migration risk of in positions its subject to a capital charge for specific interest rate risk, with the exception of securitisation exposures and n-th-to-default credit derivatives, trading book positions that is are incremental to the risks captured by the VaR-based calculation as specified in paragraph 718(Lxxxviii) above ("incremental risks"). ~~To avoid double counting a bank may, when calculating its incremental default charge, take into account the extent to which default risk has already been incorporated into the VaR calculation, especially for risk positions that could and would be closed within 10 days in the event of adverse market conditions or other indications of deterioration in the credit environment. No specific approach for capturing the incremental default risks is prescribed; it may be part of the bank's internal model or a surcharge from a separate calculation. Where a bank captures its incremental risk through a surcharge, the surcharge will not be subject to a multiplier or regulatory backtesting, although the bank should be able to demonstrate that the surcharge meets its aim. The Committee provides guidelines to specify the positions and risks to be covered by this incremental risk capital charge.~~

718(xciii). ~~Whichever approach is used, t~~The bank must demonstrate that it the approach used to capture incremental risks meets a soundness standard comparable to that of the internal-ratings based approach for credit risk as set forth in this Framework, under the assumption of a constant level of risk, and adjusted where appropriate to reflect the impact of liquidity, concentrations, hedging, and optionality. A bank that does not capture the incremental default risks through an internally developed approach must use the specific risk capital charges under the standardised measurement method as set out in paragraphs 710 to 718 and 718(xxi) the fallback of calculating the surcharge through an approach consistent with that for credit risk as set forth in this Framework.

718(xciv). ~~(deleted) Whichever approach is used, cash or synthetic exposures that would be subject to a deduction treatment under the securitisation framework set forth in this Framework (e.g. equity tranches that absorb first losses),²³ as well as securitisation exposures that are unrated liquidity lines or letters of credit, would be subject to a capital charge that is no less than that set forth in the securitisation framework.~~

718(xcv). Subject to supervisory approval, a bank may incorporate its correlation trading portfolio in an internally developed approach that adequately captures not only incremental default and migration risks, but all price risks ("comprehensive risk measure"). The value of such products is subject in particular to the following risks which must be adequately captured:

²³ [171] These include risk equivalent positions, e.g. inventories of credit exposures that the bank intends to sell through cash securitisations and for which it has in place tranching credit protections so that it retains an exposure that would be subject to deduction under the securitisation framework.

~~Banks that already have received specific risk model recognition for particular portfolios or lines of business should agree a timetable with their supervisors to bring their model in line with the new standards in a timely manner as is practicable.~~

718(xcvii). In addition to these data and modelling criteria, for a bank to apply this exception it must regularly apply a set of specific, predetermined stress scenarios to the portfolio that receives internal model regulatory capital treatment (i.e., the 'correlation trading portfolio'). These stress scenarios will examine the implications of stresses to (i) default rates, (ii) recovery rates, (iii) credit spreads, and (iv) correlations on the correlation trading desk's P&L. The bank must apply these stress scenarios at least weekly and report the results, including comparisons with the capital charges implied by the banks' internal model for estimating comprehensive risks, at least quarterly to its supervisor. Any instances where the stress tests indicate a material shortfall of the comprehensive risk measure must be reported to the supervisor in a timely manner. Based on these stress testing results, the supervisor may impose a supplemental capital charge against the correlation trading portfolio, to be added to the bank's internally modelled capital requirement.

718(xcviii). A bank must calculate the incremental risk measure according to paragraph 718(xcii) and the comprehensive risk measure according to paragraph 718(xcv) at least weekly, or more frequently as directed by its supervisor. The capital charge for incremental risk is given by a scaling factor of 1.0 times the maximum of (i) the average of the incremental risk measures over 12 weeks; and (ii) the most recent incremental risk measure. Likewise, the capital charge for comprehensive risk is given by a scaling factor of 1.0 times the maximum of (i) the average of the comprehensive risk measures over 12 weeks; and (ii) the most recent comprehensive risk measure. Both capital charges are added up. There will be no adjustment for double counting between the comprehensive risk measure and any other risk measures.

9. Model validation standards

718(xcix). It is important that banks have processes in place to ensure that their internal models have been adequately validated by suitably qualified parties independent of the development process to ensure that they are conceptually sound and adequately capture all material risks. This validation should be conducted when the model is initially developed and when any significant changes are made to the model. The validation should also be conducted on a periodic basis but especially where there have been any significant structural changes in the market or changes to the composition of the portfolio which might lead to the model no longer being adequate. More extensive model validation is particularly important where specific risk is also modelled and is required to meet the further specific risk criteria. As techniques and best practices evolve, banks should avail themselves of these advances. Model validation should not be limited to backtesting, but should, at a minimum, also include the following:

- (a) Tests to demonstrate that any assumptions made within the internal model are appropriate and do not underestimate risk. This may include the assumption of the normal distribution, the use of the square root of time to scale from a one day holding period to a 10 day holding period or where extrapolation or interpolation techniques are used, or pricing models;

VII. Changes to the disclosure requirements for market risk

23. The disclosure requirements for market risk set out in Pillar 3, Section II.D.3, of Part 4 of the Basel II Framework (Tables 10 and 11) are amended as follows. Changed wording is underlined.

3. *Market risk*

Table 10

Market risk: disclosures for banks using the standardised approach²⁴

Qualitative disclosures	(a)	The general qualitative disclosure requirement (paragraph 824) for market risk including the portfolios covered by the standardised approach.
Quantitative disclosures	(b)	The capital requirements for: <ul style="list-style-type: none">• interest rate risk;²⁵• equity position risk;• foreign exchange risk; and• commodity risk.

²⁴ The standardised approach here refers to the "standardised measurement method" as defined in Part 2, Section VI C.

²⁵ Separate disclosures are required for the capital requirements on securitisation positions under Table 9.

VIII. Treatment for illiquid positions

24. Section VI.A.2 of Part 2 of the Basel II Framework outlining the prudent valuation guidance will be moved to a new Section VII since the scope has been expanded from positions in the trading book to all positions that are accounted for at fair value, whether they are in the trading book or in the banking book. This captures the original objective of the requirement which was defined when only instruments in the trading book were accounted for at fair value. The paragraphs are changed as follows. Changed wording compared to the previous paragraphs 690 to 699 is underlined.

VII. Treatment for illiquid positions

A. Prudent valuation guidance

718(c). This section provides banks with guidance on prudent valuation for positions that are accounted for at fair value, whether they are in the trading book or in the banking book. This guidance is especially important for positions without actual market prices or observable inputs to valuation, as well as less liquid positions which, ~~although they will not be excluded from the trading book solely on grounds of lesser liquidity,~~ raise supervisory concerns about prudent valuation. The valuation guidance set forth below is not intended to require banks to change valuation procedures for financial reporting purposes. Supervisors should assess a bank's valuation procedures for consistency with this guidance. One factor in a supervisor's assessment of whether a bank must take a valuation adjustment for regulatory purposes under paragraphs 718(cx) to 718(cxii) should be the degree of consistency between the bank's valuation procedures and these guidelines.

718(ci). A framework for prudent valuation practices should at a minimum include the following:

1. Systems and controls

718(cii). Banks must establish and maintain adequate systems and controls sufficient to give management and supervisors the confidence that their valuation estimates are prudent and reliable. These systems must be integrated with other risk management systems within the organisation (such as credit analysis). Such systems must include:

- Documented policies and procedures for the process of valuation. This includes clearly defined responsibilities of the various areas involved in the determination of the valuation, sources of market information and review of their appropriateness, guidelines for the use of unobservable inputs reflecting the bank's assumptions of what market participants would use in pricing the position, frequency of independent valuation, timing of closing prices, procedures for adjusting valuations, end of the month and ad-hoc verification procedures; and
- Clear and independent (ie independent of front office) reporting lines for the department accountable for the valuation process. The reporting line should ultimately be to a main board executive director.

- The model should be subject to periodic review to determine the accuracy of its performance (eg assessing continued appropriateness of the assumptions, analysis of P&L versus risk factors, comparison of actual close out values to model outputs).
- Valuation adjustments should be made as appropriate, for example, to cover the uncertainty of the model valuation (see also valuation adjustments in paragraphs 718 (cviii) to 718 (cxii)).

Independent price verification

718(cvi). Independent price verification is distinct from daily mark-to-market. It is the process by which market prices or model inputs are regularly verified for accuracy. While daily marking-to-market may be performed by dealers, verification of market prices or model inputs should be performed by a unit independent of the dealing room, at least monthly (or, depending on the nature of the market/trading activity, more frequently). It need not be performed as frequently as daily mark-to-market, since the objective, ie independent, marking of positions should reveal any error or bias in pricing, which should result in the elimination of inaccurate daily marks.

718(cvii). Independent price verification entails a higher standard of accuracy in that the market prices or model inputs are used to determine profit and loss figures, whereas daily marks are used primarily for management reporting in between reporting dates. For independent price verification, where pricing sources are more subjective, eg only one available broker quote, prudent measures such as valuation adjustments may be appropriate.

3. Valuation adjustments ~~or reserves~~

718(cviii). ~~Banks~~ As part of their procedures for marking to market, banks must establish and maintain procedures for considering valuation adjustments/~~reserves~~. Supervisory authorities expect banks using third-party valuations to consider whether valuation adjustments are necessary. Such considerations are also necessary when marking to model.

718(cix). Supervisory authorities expect the following valuation adjustments/~~reserves~~ to be formally considered at a minimum: unearned credit spreads, close-out costs, operational risks, early termination, investing and funding costs, and future administrative costs and, where appropriate, model risk.

B. Adjustment to the current valuation of less liquid positions for regulatory capital purposes

718(cx). Banks must establish and maintain procedures for judging the necessity of and calculating an adjustment to the current valuation of less liquid positions for regulatory capital purposes. This adjustment may be in addition to any changes to the value of the position required for financial reporting purposes and should be designed to reflect the illiquidity of the position. Supervisory authorities expect banks to consider the need for an adjustment to a position's valuation to reflect current illiquidity whether the position is marked to market using market prices or observable inputs, third-party valuations or marked to model.

Annex

Stress testing guidance for the correlation trading portfolio

1. Introduction

1. The *Revisions to the Basel II market risk framework* permit banks meeting certain conditions to calculate specific risk capital charges for the correlation trading portfolio (CTP) using a comprehensive risk modelling (CRM) approach. One of these conditions is that a bank using the CRM approach must conduct, at least weekly, a set of pre-determined stress tests for the CTP encompassing shocks to default rates, recovery rates, credit spreads, and correlations. This Annex provides guidance on the stress testing that should be undertaken to satisfy this requirement.

2. Overview

2. The goal of the stress testing standards described below is to provide estimates of the mark-to-market (MTM) changes that would be experienced by the current CTP in the event of credit-related shocks. The standards encompass both prescribed regulatory stress scenarios and high-level principles governing a bank's internal stress testing. The prescribed scenarios are not intended to capture all potential sources of stress. Rather, their primary focus is on valuation changes involving large, broad-based movements in spreads for single-name bonds and credit default swaps (CDS), such as could accompany major systemic financial or macroeconomic shocks, and associated spillovers to prices for index and bespoke tranches and other complex correlation positions. In addition to the prescribed scenarios, a bank is expected to implement a rigorous internal stress testing process to address other potential correlation trading risks, including bank-specific risks related to its underlying business model and hedging strategies.

3. Prescribed stress tests

3. The prescribed stress scenarios below are framed in terms of risk factor movements affecting credit spreads over specific historical reference periods.

The term 'risk factor' encompasses any parameter or input within the pricing model that can vary over time. Examples include, but are not limited to, single-name risk-neutral default rates/intensities, recovery rates; market-implied correlations for index tranches; parameters used to infer market-implied correlations for bespoke tranches from those for index tranches; index-single name basis risks; and index-tranche basis risks.

third (fourth) stress test, the bank should assume JTDs with zero recovery of the three (four) corporate names having the largest JTD01 measures. (JTD01 is defined as the estimated decline in the MTM value of the CTP portfolio associated with a JTD of that entity, assuming a zero recovery rate for the entity's liabilities.)

3.4 Additional technical guidance

10. Below, a given historical reference period is identified by its start date (t) and end date ($t+M$).

11. When calculating movements in risk factors over the historical reference period, the values of risk factors on dates t and $t+M$ should be calibrated to be consistent with the bank's current pricing model and with actual market prices on those days.

12. In carrying out the stress tests, the bank's methodology should reflect the current credit quality of specific names, rather than the name's credit quality during the historical reference period. For example, if the current credit quality of a particular firm is worse than during the historical reference period, the shocks to risk factors for that firm should be consistent with those for similar quality firms over the reference period. Subject to supervisory approval, proxies for credit quality may be based on external ratings, implied ratings from credit spreads, or possibly other methods.

13. The current CTP's stressed MTM loss should be calculated as the difference between its current MTM value and its stressed MTM value.

14. MTM values should be based on full portfolio revaluation (e.g., no delta approximations).

15. Stress tests should be performed under the following assumptions:

- (a) Portfolio positions are held static at their current levels (e.g., no recognition of dynamic hedging within the period).
- (b) All credit-related risk factors are instantaneously shocked.
- (c) Risk factors not directly related to credit risk (e.g., foreign exchange rates, commodity prices, risk-free term structures of interest rates, etc.) are fixed at current levels.
- (d) In general, within the prescribed stress tests, the difference between the shocked value and the current value of each risk factor should be set equal to its absolute (as opposed to relative) change between dates t and $t+M$. Exceptions are to be approved by the supervisor.

This treatment presumes that each stress scenario generates price effects that are internally consistent (e.g., positive spreads, no arbitrage opportunities). If this is not the case, a simple rescaling of certain risk factors may address the issue (e.g., a re-parameterisation to ensure that implied correlations and risk-neutral default rates and recoveries remain bounded between zero and one).

16. In cases where the historical value of a risk factor at date t or $t+M$ is not known (perhaps because the current pricing model differs from that used over the interval t to $t+M$), the risk factor value will need to be 'backfilled'. Subject to supervisory approval, the backfilling method used by the bank should be consistent with the current pricing model and observed historical prices at t and $t+M$.