CENTRAL BANK OF NIGERIA

Guidance Notes on the Calculation of Capital Requirement for Market Risk

STANDARDIZED APPROACH

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MARKET RISK CAPITAL REQUIREMENT

1.0 INTRODUCTION

- Banks and banking groups shall comply on an ongoing basis with capital requirements for risks generated by operations in markets for financial instruments, foreign exchange and commodities. The capital requirement, takes into account both on- and off-balance positions that are subject to market risk.
- This regulation identifies and prescribes the treatment of positions and settlement risk pertaining to interest rate-related instruments and equities in the trading book and foreign exchange risk and commodity risk throughout the bank.
- Capital requirements will be calculated using the Standardized Approach. Under this method, banks are to calculate their total capital requirement using a building-block approach, by summing up the individual capital requirements for the risks mentioned above.
- For the purpose of calculating capital requirements for market risks, positions shall be measured at fair value at the close of each business day.
- In the case of off-balance-sheet transactions without a reference instrument[1], the notional principal amount shall be used, except where one of the present values or sensitivity methods set out under the treatment of position risk in the supervisory trading book applies.
- For off-balance-sheet transactions involving options and warrants, one of the methods set out under the treatment of options shall be apply.
- Foreign exchange transactions shall be converted into naira at the spot exchange rate at the close of each business day. Unhedged off-balance-sheet transactions other than unsettled spot transactions may be converted into naira at the current forward exchange rate for maturities equal to the residual life of the transaction.

[1]For example, interest rate swaps or forward rate agreements.

2.0 POSITION RISK IN THE SUPERVISORY TRADING BOOK

- Position risk is calculated for the bank's supervisory trading book, and it consists of two separate components:
  a) **General risk** refers to the risk of losses, caused by general adverse movements in the prices of financial instruments such as debt and equity securities due to adverse movements in market interest rates.
  b) **Specific risk** refers to the risk of losses caused by adverse movements in the price of financial instruments due to factors related to the individual issuer's situation.
- Separate calculations of the position risk and the related capital requirements shall be made for:
  a) **Debt securities** and other financial instruments whose values depend on interest rates and creditworthiness, including credit derivatives
  b) **Equity securities** and other financial instruments whose values depend on the developments in the equity market.
- Banks must have clearly defined policies and procedures for determining which exposures to include in, and exclude from, the trading book for the purpose of calculating their regulatory capital. They must also comply with this regulation and take into account the bank's risk management capabilities and practices. Compliance with these policies and procedures must be fully documented and subject to periodic internal audit.
- **Banks that are not able to properly measure and manage the risks associated with financial instruments which are sensitive to multiple risk factors shall not conduct business in those instruments.**
- Where positions originate with financial instruments that are sensitive to more than one risk factor, the capital requirements shall be calculated on the basis of the requirements for the individual risk components separately using any one of the two approaches below,:
  a) Separation into elementary contractual components (securities and derivatives) that are sensitive to one type of risk only and application of the capital treatment for the corresponding type of risk;

b) Transformation of a complex instrument into a series of sensitivity positions to material risk factors and application of the capital treatment for the corresponding type of risk to those positions. These sensitivity positions shall be calculated using a standard market measurement model.

- Where a bank holds positions that originate with financial instruments whose values depend on risk factors not expressly specified in this regulation, the position risk and the corresponding capital requirement shall be computed using the rules for the risk factor that are most closely correlated.
- If none of the risk factors mentioned is sufficiently correlated with the risk to which the price of the security in question relates, a capital requirement of 15% of the value (notional for derivatives and market for other types of instruments) of the contract shall be applied and netting shall be permitted only with existence of identical instruments of opposite sign.
- Banks may choose between two different methods for treating convertible bonds as follows.
  i) include convertible bonds among debt securities.
  ii) treat convertible bonds as debt securities or equity securities based on the likelihood of conversion (through the delta equivalent value)[2]. Where a bank adopts this method, it shall apply it to all securities of the same type.

2.1 POSITION RISK IN RESPECT OF DEBT SECURITIES

- In calculating position risk for debt securities, banks shall consider the supervisory trading book positions in respect of:
- Debt securities whose values depend on interest rates or similar risk factors (e.g., inflation rates) represented by on-balance-sheet assets and derivative contracts on debt securities;
  i) Interest rate derivatives;
  ii) Credit derivatives;
  iii) Other instruments whose values depend on interest rates or similar risk factors.

[2] In this case, the capital requirements for vega and gamma shall also be calculated.

- All derivatives and other off balance sheet transactions in the trading portfolio for supervisory purposes that depend primarily on interest rate must be converted according to the methods described under the treatment of derivatives in underlying positions and are subject to the capital requirement for both general and specific position risks.
- In order to determine the capital requirement against the specific risk in securitization and re-securitization positions, banks shall apply the provisions referred to under securitization.

2.2 General risk on debt securities

Banks may use two alternative methods i.e. maturity or duration method in calculating general risk on debt securities. However, banks are not allowed to adopt the duration method without the prior approval of the CBN which once adopted, must be used continuously unless a further approval is obtained for a switch.

2.2.1 Calculation of the capital requirement

A. Maturity method

The capital requirement for general risk on debt securities shall be calculated using an interest rate risk measurement system that reflects the position described in Annex B, sub-section 1 the calculation of the net position for each issue and the resulting distribution, separately for each currency, into time-bands. This is given by the sum of the values of the residual and matched positions, the latter is then weighted using the method set out in Annex B, sub-section 1.[3]

In the case of **residual currencies** the gross positions in each time-band will be subject to either the risk weightings set out in Annex A1, if positions are reported using the maturity method, or the assumed change in yield as shown in Annex A3, if positions are reported using the duration method, with no further offsets.

[3] The calculation of the capital requirement for offset positions is designed to take into account the possibility that opposite positions in the same time-band may not have the same residual maturity and the risk that the yields of different financial instruments, despite having the same maturity, may experience different variations in market value (basis risk). A similar problem arises in offsetting between different time-bands, which does not allow a bank to take account of imperfect correlation between interest rates for the different maturities.

B. Duration method

The procedure to be followed in using the duration method is set out in Annex B, sub-section 2.

2.2.2 Treatment of derivatives contracts

- Only for purposes of general risk, the positions of opposite sign relative to derivative contracts of the same type can be compensated in advance when the following conditions are met:
  a) The positions have the same nominal value and are denominated in the same currency and they mature within 7 days of each other.
  b) The reference rate for floating-rate positions is identical and the spread does not differ by more than 0.15 per cent on an annual basis, or the nominal interest rate for fixed-rate positions does not differ by more than 0.15 per percent on an annual basis.
  c) The next interest fixing date (for floating-rate positions) or the residual maturity (for fixed-rate positions) correspond within the following limits:
     i) less than one month corresponds same day limit;
     ii) between one month and one year corresponds within seven days limit;
     iii) over one year corresponds within 30 days limit.
- The first measurement method consists of treating the positions by residual maturity, as a combination of a cash asset and a cash liability of equal amount.

  For example:

  i) Off-balance-sheet transactions in which fixed-rate flows are exchanged for floating-rate flows (e.g., interest rate swaps) correspond to a combination of a **fixed rate asset** (liability) and a **floating-rate liability** (asset).
  Banks shall therefore record a long (short) position corresponding to the **fixed-rate asset** (liability) in the time-band for the maturity of the contract[4] and a short (long) position corresponding to a **floating-rate liability** (asset) slotted in the time band preceding the next interest fixing date;

[4]Maturity of entire reference term of the contract

ii) For other off-balance-sheet transactions (e.g. forwards, futures, forward rate agreements, and swaps) banks shall record a long position or short in the time band related to the settlement date and a short position or long in the time band for the residual maturity of the contract.[5]

- The second method consists of using present value or sensitivity approaches to calculate positions, which shall be broken down based on maturity or average duration[6]. Specifically, banks may use one of the following two methods:
  i) The first method consists of converting the individual payments in respect of the derivative into their present values. For this purpose, each payment shall be discounted using zero coupon cash yields. A single net present value shall be entered into each time-band, as with zero coupon bonds; these values shall be multiplied by the weights given in Annex B, Table 1;
  ii) An alternative method which may be used only by banks that adopt the duration method for calculating general risk for debt securities consists of calculating the sensitivity (duration) of the net present value[7] of the derivative implied by the change in the yield for each maturity
- Each sensitivity (duration) obtained shall be multiplied by the present value of the derivative and allocated to the corresponding time-band set out in Annex B, Table 3. The output shall be weighted for the hypothetical change in yield only.

2.3 Specific risk on debt securities

2.3.1 Calculation of the capital requirement

- In general, and by excluding the securitization positions, the capital requirement for specific risk on debt securities shall be calculated as follows: the net positions in each security in the supervisory trading book, calculated in accordance with the rules for netting, shall be allocated to uniform categories based on the nature of the issuer or obligor, the existence of risk mitigation instruments, any external or internal credit assessment and residual maturity:

[5]Residual maturity of the underlying financial instrument for forwards; time remaining to the settlement date plus maturity of the underlying financial instrument or the reference period for forward rate agreements and for derivatives with a notional underlying instrument
[6]In this case, prior offsetting shall not apply to contracts that meet the conditions set out in points a), b) and c) of this sub-section.
[7]The net present value shall be computed using spot zero coupon yields.

1) "Positions related to zero weighted issuers" factor (0% weighting),
2) "Positions related to qualified issuers" (weighting factors, as appropriate, are 20% and 50%);
3) "Positions related to unskilled issuers" (100% weighting),
4) "Positions related to high risk issuers" (risk weight 150%).

- Each of these categories is given a capital requirement (equal to the product of the above-mentioned weighting factors and 10% and 15% for national and internationally active banks).
- The capital requirement for specific risk is the sum of the net weighted positions, without offsetting long and short positions.
- The respective rule set out under securitization section should be applied in securitization positions and items included in the trading portfolio of correlation.
- Interest rate derivatives, exchange rates, repurchase agreements and debt securities deducted from regulatory capital are excluded from the calculation of the specific risk.
- In the case of derivatives with underlying debt securities, the weight for the capital requirement relating to specific risk corresponding to the credit quality of the underlying instrument shall be applied.
- A risk weight of zero shall be applied to debt securities issued or guaranteed by central governments, central banks, denominated and funded in the domestic currency.

2.3.2 Calculation of the capital requirement for positions hedged by credit derivatives

- Banks may use credit derivatives to reduce specific risk. For the purposes of calculating the specific risk capital requirement, a distinction shall be made between:
  i) Transactions for which a full allowance is recognized;
  ii) Transactions for which an 80% allowance is recognized;
  iii) Transactions where less that 80% allowance is recognized;
  iv) Transactions for which no allowance is recognized.

- Where the hedging derivative contractually provides for a payment in a fixed amount less than the amount of the hedged asset, this exposure should be subject to the rules on securitization because it leads to a segmentation of the risk ("**tranched transactions**").
- With regard to the credit derivatives based on a basket of debtors such as "first-to-default", the activity is considered secured within the basket which corresponds to the lower exposure weighted for specific risk.
- With regard to the credit derivatives based on a basket of debtors' (n^{th}-to-default) protection against credit risk is recognized only when the $(n-1)^{th}$ admitted protection has already been satisfied or have been declared in default (n-1) activities that are included in the basket.
- Once these conditions are met, the activity is considered secured within the basket which corresponds to the weighted smaller exposure for specific risk.

Transactions for which a full allowance is recognized

- Full allowance for the hedging transaction will be recognized for regulatory capital purposes where the values of the long and the short positions always move in opposite directions and to the same extent.
- This situation occurs in the case of a long cash position hedged by a total rate of return swap (or vice versa) where there is an exact match between the reference asset and the hedged position.
- In such cases, no specific risk capital requirements shall apply to both sides of the position.

Transactions for which an 80% allowance is recognized

- An 80% offset will be recognized when the value of two positions (i.e. long and short) always moves in the opposite direction but not broadly to the same extent. This would be the case when a long cash position is hedged by a credit default swap or a credit linked note (or vice versa) and there is an exact match in terms of the reference obligation, the maturity of both the reference obligation and the credit derivative, and the currency of the underlying exposure.

- In addition, key features of the credit derivative contract (e.g. credit event definitions, settlement mechanisms) should not cause the price movement of the credit derivative to materially deviate from the price movements of the cash position.

- To the extent that the transaction transfers risk (i.e. taking account of restrictive payout provisions such as fixed payouts and materiality thresholds), an 80% specific risk offset will be applied to the side of the transaction with the higher capital charge, while the specific risk requirement on the other side will be zero.

Transactions for which a partial allowance is recognized

- A partial allowance may be recognized where the values of the two positions (long and short) usually move in opposite directions, for example:
  i) In the case of a long cash position hedged by a total rate of return swap (or vice versa) where there is a mismatch between the reference asset and the hedged position but the following conditions are met:
     a) The reference asset ranks *pari passu* with or is junior to the hedged obligation;
     b) The underlying asset and hedged obligation were issued by the same issuer and contain legally enforceable cross-default or cross-acceleration clauses;
  ii) In the case of a long cash position hedged by a credit derivative (or vice versa) on the same asset where there is a currency or maturity mismatch between the underlying asset and the hedged position;
  iii) In the case of a long cash position hedged by a credit derivative (or vice versa) on another underlying asset where the hedged position is included in the deliverable obligations.
- For each of the above cases, banks shall take account of only the greater of the specific risk capital requirements relating to the credit derivative and to the hedged position.

Transactions for which no allowance is recognized

For cases that do not meet the conditions established above, the specific risk capital requirement shall be calculated for both the credit derivative and the hedged position.

2.4 CREDIT DERIVATIVES

2.4.1 General rules

For the purposes of calculating the capital requirement for position risk, the notional amount of the credit derivative shall be used unless otherwise specified.

This amount may be reduced by an amount equal to the reduction in the market value of the examined credit derivative. With regard to the calculation of the capital requirement for the specific risk on derivatives other than total rate of return swaps, banks shall use the residual maturity of the derivatives contract in place of the residual maturity of the obligation.

2.4.2 Treatment of positions in respect of protection sales

The positions shall be calculated as follows:

a) For the purpose of general risk, a total rate of return swap gives rise to a long position in the reference obligation and a short position in a government security with a maturity equal to the term remaining until the next interest fixing date[8]. The same breakdown shall also apply for specific risk purposes;
b) For the purpose of specific risk, a credit default swap (CDS) gives rise to a long position in the reference entity. Where the derivative has an external rating and meets the conditions for a qualifying debt item, the bank may recognize a long position in the derivative. If premium or interest payments are due under the CDS, these cash flows must be represented as notional positions in government bonds;
c) For the purpose of general risk, a single-name Credit Linked Note (CLN) gives rise to a long position in the CLN itself. For the purpose of specific risk, the bank shall recognize a long position in respect of the reference entity as well as another long

[8]The short position in the government security has a risk weight of zero, in compliance with the rules governing specific risk.

position in respect of the issuer of the CLN. Where the CLN has an external rating and meets the requirements for a qualifying debt item, a single long position in the CLN shall be recognized;

d) For the purpose of general risk, a multiple-name CLN providing proportional protection gives rise to a long position in the CLN itself. For the purpose of specific risk, it gives rise to a long position in each reference entity, each in an amount equal to the proportion of the notional amount of the CLN represented by each reference entity.

   For each reference entity the risk weight for specific risk shall be that in respect of the obligation with the highest risk weighting among those that can be selected. Where the CLN has an external rating and meets the requirements for a qualifying debt item, a single long position in the CLN shall be recognized;

e) A first-to-default credit derivative gives rise to a long position in an obligation of each reference entity, each in an amount equal to the notional amount. In any case, the capital requirement shall not be greater than the amount of the maximum credit event payment.

   An n^{th}-to-default credit derivative gives rise to a long position in an obligation of each reference entity except for the n-1 with the lowest specific risk capital requirement, each in an amount equal to the notional amount.

   In any case, the capital requirement cannot be greater than the amount of the maximum credit event payment.

   Where such a derivative has an external rating and satisfies the requirements for a qualifying debt item, a single long position for the derivative shall be recognized;

f) A CDS index shall be broken down into as many CDSs as there are index components, each treated in accordance with the provisions for single-name CDSs;

g) Single-name credit spread derivatives shall be treated as CDSs. In the case of options, the amount shall be calculated as the delta equivalent value of the notional;

h) Derivatives on CDS indices that give rise to a position in the underlying CDS index; the rules set out in point vi above shall apply to such positions. In the case of options, the amount shall be calculated as the delta equivalent value of the notional.

2.4.3 Treatment of positions in respect of protection purchases

- For protection buyers, positions shall be determined as the mirror image of the protection seller, with the exception of an issued Credit Linked Note, which only gives rise to a short position in the reference entity.
- If there are call options on the security, the maturity of the short position shall be equal to the maturity of the option.
- In the case of n^{th}-to-default credit derivatives, protection buyers may offset specific risk for all underlying assets excluding the riskiest n-1 for specific risk purposes.

2.5 POSITION RISK IN RESPECT OF EQUITY SECURITIES

2.5.1 Calculation of the capital requirement

The capital requirement for the position risk relating to equity securities shall be the sum of the following capital requirements:

- For general risk on equity securities: 10% and 15% of the overall net position
- For specific risk on equity securities: 10% and 15% of the overall gross position

For the purpose of calculating equity position risk, account shall be taken of all positions in the supervisory trading book in respect of shares and similar instruments, such as, derivatives on equity indices[9].

The overall gross position shall be the sum, in absolute value, of all net long and short positions. The difference, in absolute value, between all net long positions and all net short positions, calculated market-by-market (i.e. separately for each country in which the individual securities held by the banks are traded) shall constitute the overall net position in securities traded on regulated markets.

In order to compute the overall gross and net positions, stock index derivatives[10] may be treated as separate securities or broken down into as many positions as there are equity securities that contribute to the calculation of the index. In this case, the

[9]Banks shall not take account of convertible bonds for the entire period prior to the expiry of the option if they are included among debt securities.
[10]For example, futures and options on stock indices.

individual positions resulting from the breakdown of the index may be offset against opposite positions in the same equity securities relating to other transactions.

If the matching of the positions is part of a deliberate arbitrage strategy and the positions are subject to separate control, a capital requirement of 2% of both the offset positions to cover divergence and execution risk shall be required.

Offsetting shall be permitted even where the set of positions in equity securities that are offset does not fully reflect the composition of the index under the contract, provided that the total value of these positions represents at least **90%** of the market value of the index.

The portion of stock-index derivatives that is not offset shall be treated as a long or short position.

2.5.2 Derivative contracts on well-diversified stock indices traded on a regulated Market

Banks that do not break down derivative contracts on well-diversified stock indices traded on a regulated market may decide not to apply a specific risk capital requirement for such derivatives, provided that the following conditions are met:

- The index shall reflect the stock market generally (sectorial indices are therefore excluded) and regard a regulated market with at least 200 listed equities;
- The index shall be based on a basket composed of at least 30 equities;
- None of the equities that make up the basket shall have a weight of more than10% in the calculation of the value of the index. This limit may be increased to 20% if the top 5 equities in the basket do not account for more than 60% of the entire basket.

In addition to the general risk capital requirement, banks shall apply a capital requirement of 2% to the net long or short positions in the contracts in question to cover execution risk.

3.0 SETTLEMENT RISK IN THE SUPERVISORY TRADING BOOK

- Transactions in debt securities, equity securities, derivatives, currencies and commodities that remain unsettled after the maturity date expose banks to the risk of loss arising from the counterparty's failure to settle.
- The provisions of this Section require the application of capital requirements, calculated in accordance with the methods set out in the following sub-sections, for risks in relation to all unsettled transactions in financial instruments (including derivatives), currencies and commodities.
- Where the transactions are settled on a **"Delivery versus Payment" (DVP) basis**[11], the loss is the difference between the agreed settlement price and the fair value of the financial instruments, the currencies or commodities to be received (delivered);
- Transactions settled on a **non-DVP basis** where cash is paid before the underlying is delivered, or the underlying is delivered before cash is paid (also called "free delivery"), the loss is the fair value of the financial instruments, currencies or commodities transferred to the counterparty for which payment is not received, or the cash paid without delivery of the underlying.

  These rules shall not apply to repurchase and reverse-repurchase agreements or securities or commodities lending or borrowing transactions. In the event of system-wide failure of a settlement or clearing system, the CBN may temporarily waive, in part or in full, the application of capital requirements to unsettled transactions until the situation is rectified. In such circumstances, the failure of a counterparty to settle a trade shall not be deemed a default for the purposes of credit risk.

3.1 Capital requirements for DVP transactions

The capital requirement shall be calculated by multiplying the difference between the agreed settlement price and the fair value of the financial instruments, currencies or commodities to be received (delivered) - by the following percentages, broken down by time-band:

Number of business days after the settlement date	Risk weight (%)
5 to 15	10
16 to 30	50

[11]"Payment versus payment" (PVP) transactions are treated as DVP transactions

31 to 45	75
46 or more	100

3.2 Capital requirements for non-DVP transactions

- Banks that pay cash for or deliver financial instruments, currencies or commodities and do not receive the corresponding deliverable or payment due in the course of the same day or, for cross-border transactions, by the next working day, shall recognize the transferred asset as a receivable from the counterparty and apply the same calculation method for the capital requirement used for exposures not included in the supervisory trading book.
- Banks may apply the following risk weights to the exposures in respect of unsettled transactions:

    a) The risk weights used in the standardized approach where they have no other exposures to the counterparty in the banking book; or

    b) A 100% risk weight.

- Regardless of the method used, where the exposure amounts in respect of unsettled DVP transactions are not material, banks may apply a 100% risk weight.
- Banks that made payment or delivery but yet to receive the deliverable or payment from the counterparty by the fourth business day after the agreed delivery date[12] must deduct from its regulatory capital, both the amount transferred and any positive difference in its favour between the fair value of the underlying receivable and the cash transferred or between the cash receivable and the fair value of the transferred deliverable.

4.0 FOREIGN EXCHANGE RISK

Banks shall comply with a capital requirement of 10% and 15% of their net open position in foreign currency and gold. The net open position will be determined in accordance with the provisions of in the foreign exchange manual issued by the CBN.

[12]The "second leg" in a non-DVP transaction

5.0 COMMODITIES RISK

- Banks shall hold a specific capital requirement against the risk of losses on positions in commodities including precious metals but excluding gold. The calculation of the capital requirement on commodity positions shall cover all on- and off-balance sheet assets and liabilities in commodities. Commodity positions held solely for the purposes of stock financing may be excluded.
- Bank may use the simplified approach or the maturity ladder approach method to calculate the capital requirement.

5.1 Simplified approach

- Banks that use the simplified approach shall hold a capital requirement for each commodity calculated as the sum of the following elements:

i) 15% capital charge on the net position in each commodity (long or short) converted at current spot rates.

ii) 3% additional capital charge of the bank's gross positions, long plus short, in each commodity converted at current spot price.

- The total capital requirement for commodities risk shall be calculated as the sum of the capital requirements calculated for each commodity.

5.2 Maturity ladder approach

- Banks that opt to use the maturity ladder approach to calculate their capital requirements shall notify the CBN. The method selected by banks shall be applied on an ongoing basis.
- The bank shall use a separate maturity ladder[13] for each commodity. Positions held in the same commodity shall be assigned to the appropriate maturity bands. Stocks shall be assigned to the first maturity band.
- Positions in the same commodity may be offset and assigned to the appropriate maturity bands on a net basis for positions in contracts maturing on the same

[13]The maturity bands are: 1 month or less; over 1 month, not exceeding 3 months; over 3 months, not exceeding 6 months; over 6 months, not exceeding 12 months; over 1 year, not exceeding 2 years; over 2 years, not exceeding 3 years; over 3 years.

date and for positions in contracts maturing within 10 days of each other if the contracts are traded on markets which have daily delivery dates.

- The bank's capital requirement for each commodity shall be calculated on the basis of the relevant maturity ladder as the sum of the following[14]:

    i. The matched position in the same maturity band for each band multiplied by 1.50% and by the spot price of the commodity;

    ii. The unmatched position in the same maturity band multiplied by 0.6 % (carry rate), the number of maturity bands into which it is carried forward[15], and the spot price for the commodity;

    iii. The residual unmatched position, multiplied by 15 % (outright rate) and by the spot price for the commodity.

- The bank's overall capital requirement for commodities risk shall be the sum of the capital requirements calculated for each commodity as above.

6.0 TREATMENT OF OPTIONS

- For the purpose of calculating capital requirements for market risks, special treatment shall be applied to options. Options are derivative products whose price risk is difficult to measure in view of the potential for errors in applying linear instruments to them.

- Banks may use one of the following alternative methods in the treatment of options:

    i) The simplified approach;

[14]For the purposes of calculating capital requirements, the following definitions shall apply:
- "matched position in same maturity band" shall mean a commodity position in a given maturity band offset by a matching position for the same amount in the same band;
- "unmatched position in same maturity band" shall mean a residual long or short position in a given maturity band;
- "matched position between two maturity bands" shall mean a commodity position unmatched in the same maturity band but offset by an unmatched position in a subsequent maturity band;
- "unmatched position" shall mean a position that is unmatched in the same maturity band and cannot be offset by an unmatched position of the opposite sign in a subsequent band;
- "net position in each commodity" shall mean the difference between the bank's long and short position in the same commodities and in derivatives (futures, swaps, options or warrants) in the same commodity.

[15]In practice, if the unmatched position refers to two successive bands, then the product will be equal to 0.6% because the interval between the two bands is 1. If the bands are not contiguous (for example, "over 1 month, not exceeding 3 months" and "over 6 months, not exceeding 12 months") then the product will be 0.6% multiplied by the interval between the two bands, which in our example would be 0.6%*2=1.2%.

ii) The delta-plus method;

iii) The scenario approach.

6.1 Simplified approach

- Banks that use a limited range of purchased options may adopt the simplified approach. Under this approach, positions in options and the associated underlying, both spot and forward, shall be subject to separately calculated capital requirements that incorporate both general risk and specific risk.
- The capital requirement calculated under this approach is as follows:

  i) For long positions in the underlying (cash and forward) associated with purchased put options or short positions in the underlying (cash and forward) associated with purchased call options, the capital requirement shall be: the market value of the underlying security multiplied by the sum of specific and general market risk charges for the instrument, less any positive intrinsic value of the option;

  ii) For purchased call options or purchased put options, the capital requirement shall be the lesser of:

    a) The market value of the underlying multiplied by the sum of the specific and general risk weights for the underlying;

    b) The market value of the option[16].

6.2 Delta-plus method

- The delta-plus method uses the sensitivity parameters associated with options. Banks that adopt this method shall recognize options as positions equal to the market value of the underlying multiplied by the delta (the delta-weighted position) in measuring position risk in the supervisory trading book, foreign exchange risk and commodities risk.
- However, since delta does not sufficiently cover the risks associated with options positions, banks shall also calculate capital requirements for gamma (the rate of

[16]In the case of options on currencies and commodities not held in the supervisory trading book, the book value can be used in place of market value.

change of delta) and vega (the sensitivity of the value of an option to a change in price volatility) in order to calculate the total capital requirement.

- These sensitivities shall be calculated in accordance with a standard market model or with the bank's proprietary model, previously endorsed by the CBN.
- The capital requirements for specific risk shall be calculated separately by multiplying the delta equivalent value of each option by the appropriate risk weights.

6.2.1 Calculation of the capital requirement for general delta risk

- Delta-weighted positions for options with debt securities as the underlying shall be incorporated in the calculation of the capital requirement in accordance with one of the procedures reflected in the sub-section on position risk on debt securities after slotting the positions into the time-bands set out in Annex B.
- The capital requirement for options with equities as the underlying shall be calculated on the basis of the delta-weighted positions in accordance with the provisions reflected in the sub-section on position risk on equity securities. The capital requirement for delta-weighted positions in respect of options on foreign currency shall be calculated on the basis of the method specified in the section on foreign exchange risk while that for delta-weighted positions in respect of options on commodities shall be calculated in accordance with any of the methods set out in the section on commodity risk
- For other derivatives, banks shall adopt a two-legged approach, with one entry at the time the underlying contract takes effect and another at the time the underlying contract matures[17]. Banks shall treat floating-rate instruments with caps or floors as a combination of floating rate securities and a series of European-style options[18].

[17] For example, a purchased call option on a June three-month interest-rate future will in April be considered, on the basis of its delta-equivalent value, to be a long position with a maturity of five months and a short position with a maturity of two months. An equivalent written option will be considered to be a long position with a maturity of two months and a short position with a maturity of five months.

[18] European-style options are options that the holder may exercise only on the expiry date. The date is set by the parties if the transaction involves an over-the-counter option and by market practice if it involves an exchange-traded option. American-style options can be exercised on any business day as from the effective date of the contract up to and including the expiry date.

6.2.2 Calculation of the capital requirements for general gamma and vega risk

- Banks shall calculate the gamma and vega for each option position (including hedged positions) separately.
- For the purpose of calculating the capital requirement for gamma, a "gamma impact" shall be calculated for each option on the same underlying using a Taylor series expansion:

$$\text{gamma impact} = 1/2 * \text{gamma} * VU^2$$

where VU is the variation of the underlying[19]and calculated as follows:

i) For interest-rate options if the underlying is a bond, the market value of the underlying shall be multiplied by the risk weights set out in Annex B, Table 1. An equivalent calculation shall be carried out where the underlying is an interest rate, based on the assumed changes in the corresponding yield in Annex B, Table 1;

ii) For options on equities and equity indices and for foreign-exchange and gold options, the market value of the underlying shall be multiplied by 0.10 and 0.15 as the case may be;

iii) For options on commodities, the market value of the underlying shall be multiplied by 0.15[20];

iv) In the case of financial instruments sensitive to more than one risk factor[21], in calculating the gamma impact for each risk factor, the market value of the underlying shall be multiplied by the corresponding coefficient referred to in the previous points.

v) However, for positions in the same underlying for general gamma and vega risks the following shall apply:
    - for interest rates, each time-band as set out in Annex B table 3
    - for equities and stock indices, each national market;

[19]For options on interest rates, underlyings in the same time-bands referred to in Annex B, Table 1, shall be considered the same underlying. For options on equities and equity indices, underlyings in the same national market shall be considered the same. For options on foreign exchange and gold, each currency pair and gold shall be considered the same.
[20] For options on commodities, underlyings in the same commodity shall be considered to be the same (see Part 2, Section VI for a definition of "position in the same commodity").
[21] Where the bank has opted for the second type of representation (sensitivity positions) referred to in Section III.

- for foreign currencies and gold, each currency pair and gold;
- for commodities, each individual commodity

- The individual gamma impacts for each option on the same underlying shall be summed to obtain a net positive or negative gamma impact for each class of the underlying.
- The total gamma capital requirement shall be the sum of the absolute value of the net negative gamma impacts.
- Banks shall calculate the capital requirements for volatility risk by multiplying the sum of the vegas for all options on the same underlying by a proportional shift in volatility of ± 25%. The total capital requirement for vega risk shall be the sum of the absolute value of the individual capital requirements for each underlying.

6.3 Scenario approach

- The scenario approach uses simulation techniques to calculate variations in the value of an option's portfolio and the associated hedging positions as a result of hypothetical changes in the level and volatility of the prices of the underlyings.
- Under this approach, the capital requirement for general risk is determined by the scenario (i.e. the combination of price and volatility changes) that produces the greatest loss.
- Banks that intend to adopt the scenario approach for options shall follow the procedures set out in the guidelines for recognizing internal models for calculating capital requirements for market risk.

6.3.1 Calculating the capital requirements

- For the purpose of calculating the capital requirement for general risk, banks shall construct a series of matrices in which they record changes in the value of the option portfolio for simultaneous changes in the option's underlying rate or price and in the volatility of that rate or price. A different matrix shall be constructed for each individual underlying.
- The options and related hedging positions shall be evaluated over a specified range above and below the current value of the underlying.

- The range for interest rates shall be consistent with the assumed changes in yield set out in Annex B, Table 3. Other ranges are ± 10%/15% for equities, ± 10%/15% for foreign exchange, and ± 15% for commodities. In the case of financial instruments sensitive to more than one risk factor, the intervals shall be those associated with the material risk factors.
- For all risk categories, at least seven observations (including the current observation) shall be used to divide the range into equally spaced intervals.
- For the second dimension of the matrix – regarding the change in the volatility of the underlying rate or price, a shift of ±25% shall be adopted. The CBN may require individual banks to use different changes in volatility.
- After calculating the matrix, each cell contains the net profit or loss of the option and the underlying hedged instrument. The capital requirement shall then be calculated as the largest loss contained in the matrix.
- The capital requirements for specific risk shall be calculated separately by multiplying the delta equivalent value of each option by the appropriate risk weights
- Banks with significant options business for which no capital requirements have been established shall monitor the other risks associated with such operations. Specifically, these include 'rho'[22], which is the rate of change in the value of the option with respect to the interest rate, and theta, which is the rate of change in the value of the option with respect to time.

[22] Rho measures the sensitivity of an option or options portfolio to a change in interest rate. For example, if an option or options portfolio has a rho of 5.5, then for every percentage-point increase in interest rates, the value of the option increases by 5.5%

Definition of Terms

- ***Backtesting*** shall mean tests that compare changes in the value of the portfolio with risk measures generated by the model.
- ***Banking book*** shall mean all positions not booked in the supervisory trading book;
- ***Borrower*** shall mean an individual obligor or group of connected obligors;[23]
- ***Default risk*** shall mean the risk of non-performance by the issuer;
- ***Delivery versus payment (DVP)*** shall mean the settlement of transactions where the counterparties simultaneously exchange performance (delivery of cash in exchange for financial assets or vice-versa);
- ***Delta*** shall mean the ratio of the expected change in an option price and a small change in the price of the financial instrument underlying the option.

  Delta approximates the probability that the option will be exercised and is calculated as the first derivative of the fair value of the option with respect to that of the underlying instrument;
- ***Delta-equivalent value*** shall mean the fair value of the underlying financial assets (or, where none, the notional principal) multiplied by the delta;
- ***Duration*** shall mean the indicator of the sensitivity of the price of a debt instrument to small parallel shifts in the yield curve, measured as the average maturity of all the cash flows in respect of principal and interest generated by the instrument, weighted by the present value of the cash flows;
- ***Effective net change in the portfolio*** shall mean the difference between the effective revaluations of the portfolio, where the effective revaluation is determined by subtracting commissions, the results of any intraday trading and accrued interest from the operating result;

[23] Refer to the definition of "connected borrowers" in Title V, Chapter 1, Section I, sub-section 3).

- ***Event risk*** shall mean the risk of rapid movements in prices that are greater than those in the general market, due, for example, to a change in rating grade or announcements of mergers/acquisitions;
- ***Foreign currency assets and liabilities*** shall mean all on- and off-balance sheet assets and liabilities in respect of each currency, including transactions in naira indexed to the exchange rates of foreign currencies. Transactions in gold shall be treated as foreign currency transactions;
- ***Gamma*** shall mean the rate of change of delta;
- ***Gross foreign currency short (or debtor) position*** shall mean the foreign currency liabilities, foreign currencies to be delivered in respect of unsettled transactions (cash or forward) and other off-balance-sheet transactions giving rise to an obligation or right to sell foreign currency assets;
- ***Gross general equity position*** shall mean the absolute value of the sum of all net long and short equity positions;
- ***Gross long (or creditor) foreign currency position*** shall mean the foreign currency assets, foreign currencies to be received in respect of unsettled transactions (cash or forward) and other off-balance-sheet transactions giving rise to an obligation or right to purchase foreign currency assets;
- ***Gross long (or creditor) position*** shall mean the securities holdings, securities to be received in respect of unsettled transactions (cash or forward) and other off-balance-sheet transactions giving rise to an obligation or right to purchase specified securities, foreign currencies, commodities, indices, interest rates or exchange rates;
- ***Gross short (or debtor) position*** shall mean the technical overdrafts, securities to be delivered in respect of unsettled transactions (cash or forward) and other off-balance-sheet transactions giving rise to an obligation or right to sell specified securities, indices or interest rates;
- ***Hypothetical change in the portfolio*** shall mean the hypothetical revaluation difference of the portfolio, where the hypothetical revaluation of the portfolio on

day t shall refer to the value obtained by multiplying the quantities presented in the portfolio on day t-1 by the prices on day t;

- ***Idiosyncratic risk*** shall mean the risk of price changes due to daily trading activity;
- ***Incremental Risk Charge (IRC)*** shall mean the measure of the maximum potential loss that would result from a change in price resulting from the risk of default or from a change in the rating class of the issuer;
- ***Matched position*** shall mean the lesser of the two amounts in respect of a gross debtor position and a gross creditor position;
- ***Multilateral trading facility*** (mtf), a trading system that facilitates the exchange of financial instruments between multiple parties. Multilateral trading facilities allow eligible contract participants to gather and transfer a variety of securities, especially instruments that may not have an official market. These facilities are often electronic systems controlled by approved market operators or larger investment banks. Traders will usually submit orders electronically, where a matching software engine is used to pair buyers with sellers.
- ***Net foreign currency position*** shall mean the difference between the gross long position and the gross short position in each currency;
- ***Net general equity position*** shall mean the difference between the sum of net long positions and the sum of net short positions in individual equities in the portfolio;
- ***Net long or short position*** in a security shall mean the difference between the gross on- and off-balance-sheet creditor and debtor positions in respect of the same issue of debt securities. For this purpose, banks shall not take account of futures and other off-balance-sheet transactions that envisage the option upon maturity of delivering securities from different issues as well as derivatives contracts on interest rates and indices. With regard to credit derivatives, netting shall be permitted in the following cases: a) credit derivatives with the same terms and conditions (maturity, reference assets, etc.); b) long cash positions hedged by total rate of return (TROR) contracts (or vice versa), provided that

there is an exact match between the reference assets and the hedged assets and there is no maturity mismatching. For equity securities, netting shall involve the same type of securities issued by the same issuer; for derivatives on equity indices, netting shall be permitted provided that they refer to the same index and have the same maturity;

- ***Notional principal of off-balance-sheet transactions*** shall mean the contractually defined nominal amount of the transactions;
- ***Off-balance-sheet transactions*** shall mean derivatives contracts and:

  Unsettled cash or forward contracts for the sale of securities, currencies and commodities;

  Irrevocable commitments to purchase arising in respect of participation in an underwriting syndicate for the placement of securities;

- ***Regulated market*** shall mean a multilateral system administered and/or operated by the market manager, which brings together or facilitates the bringing together of multiple third-party buying and selling interests in financial instruments - in the system and in accordance with its nondiscretionary rules - in a way that results in a contract, in respect of the financial instruments admitted to trading under its rules and/or systems, and which is authorized and functions regularly;
- ***Residual position*** shall mean the residual amount from netting, equal to the difference between a long position and short position;
- ***Stressed VaR (SVAR)***, measure the maximum potential loss that would result from a change in price with a certain probability over a certain time horizon obtained by considering the composition of the current portfolio and applying market inputs collected over an historical period characterized by adverse conditions (stress).
- ***Value at risk (VaR)*** shall mean the maximum potential loss that would result from a price change with a given probability over a specified time horizon.

- ***Vega*** shall mean the sensitivity of the value of an option with respect to a change in the implicit volatility of the price;
- **Supervisory trading book** shall mean positions held intentionally for short-term resale and/or with the intent of benefiting in the short term from differences between the purchase and sale prices, or the changes in the price or the interest rate. Positions shall mean proprietary positions and positions arising from client servicing or market making.

ANNEX A: REQUIREMENTS FOR THE SUPERVISORY TRADING BOOK

Part A - Trading intent

Trading intent shall be established through compliance with the following requirements:

a) There must be a clearly documented trading strategy for the position/instrument or portfolios, approved by the board and management, which shall include the expected holding horizon;
b) There must be clearly defined policies and procedures for the active management of the position, which shall include the following:
   i) Positions entered into on a trading desk;
   ii) Position limits are set and monitored for appropriateness;
   iii) Dealers have the autonomy to enter into/manage the position within agreed limits and according to the approved strategy;
   iv) Positions are reported to the board and management as an integral part of the bank's risk management process;
   v) Positions are actively monitored with reference to market information sources and an assessment is made of the marketability or hedgeability of the position or its component risks, including the assessment of the quality and availability of market inputs to the valuation process, level of market turnover and sizes of positions traded in the market;
c) There must be clearly defined policies and procedures to monitor the position against the bank's trading strategy including the monitoring of turnover and stale positions in the bank's supervisory trading book;

At a minimum, these policies and procedures shall establish:

- The positions the bank considers to be trading and as constituting part of the supervisory trading book for capital requirement purposes;
- The extent to which a position can be marked to market daily by reference to an active, liquid two-way market;
- For positions that are marked to model, the extent to which the bank can:
  i) Identify all material risks of the position;

ii) Hedge all material risks of the position with instruments for which an active, liquid two-way market exists;
iii) Derive reliable estimates for the key assumptions and parameters used in the model;
iv) Generate valuations for the position that can be validated externally in a consistent manner;
v) Actively risk manage the position within its trading operations;
vi) Transfer risk or positions between the banking and supervisory trading books.

Compliance with these policies and procedures shall be fully documented and subject to periodic internal audit.

Part B – Systems and controls for the prudent valuation of positions in the supervisory trading book

Banks shall establish and maintain systems and controls sufficient to provide prudent and reliable valuation estimates.

B.1 Systems and controls

Systems and controls shall include at least the following elements:

a) Clearly defined responsibilities of the various areas involved in the determination of the valuation, sources of market information and review of their appropriateness, frequency of independent valuation, timing of closing prices, procedures for adjusting valuations, month end and ad hoc verification procedures;
b) Reporting lines for the unit accountable for the valuation process must be clear and independent of the front office.
c) Information flows (reporting) clear and independent (i.e. independent from front office) for the department accountable for the valuation process.

The reporting line shall ultimately be to the board.

B.2 Prudent valuation methods

- Marking to market is the at-least-daily valuation of positions at readily available close out prices that are sourced independently. Examples include exchange prices, screen prices or quotes from several independent reputable brokers.
- When marking to market, the more prudent side of bid/offer shall be used unless the bank is a significant market maker in the particular type of financial instrument or commodity in question and it can close out at mid-market.
- Where marking to market is not possible, banks shall mark to model their positions/portfolios before applying market risk capital treatment. Marking to model is defined as any valuation which has to be (i) benchmarked, (ii) extrapolated or (iii) otherwise calculated from a market input.
- The following requirements shall be complied with when marking to model:
  a) The board and management shall be aware of the elements of the trading book which are subject to mark to model and shall understand the materiality of the uncertainty this creates in the reporting of the risk/performance of the business;
  b) Market inputs shall be sourced, where possible, in line with market prices, and the appropriateness of the market inputs of the particular position being valued and the parameters of the model shall be assessed frequently;
  c) Where available, valuation methodologies which are accepted market practice for particular financial instruments or commodities shall be used;
  d) Where the model is developed by the bank itself, it shall be based on appropriate assumptions that have been assessed and challenged by suitably qualified parties independent of the model's development process. In particular, the model shall be developed or approved independently of the front office and shall be independently tested, including validation of the mathematics, assumptions and software implementation;
  e) There shall be formal change control procedures in place and a secure copy of the model shall be held and periodically used to check valuations;
  f) The persons responsible for risk management shall be aware of the weaknesses of the models used and how best to reflect those in the valuation output;
  g) The model shall be subject to periodic review to determine the accuracy of its performance (e.g. assessing the continued appropriateness of assumptions,

analysis of profit and loss versus risk factors, comparison of actual close out values to model outputs).

- In addition to daily marking to market or marking to model, independent price verification shall be performed. This is the process by which market prices or model inputs are regularly verified for accuracy and independence. While daily marking to market may be performed by dealers, verification of market prices and 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).
- Where independent pricing sources are not available or pricing sources are too subjective, prudent measures such as valuation adjustments may be appropriate.

B.3 Supervisory value adjustments

Banks shall establish and maintain procedures for considering supervisory value adjustments.

B.3.1 General Rules

Banks shall consider the advisability of applying value adjustments in respect of the following factors: unearned credit spreads, close-out costs, early termination of positions, investing and funding costs, future administrative costs and, where appropriate, model risk.

B.3.2 Rules for less liquid positions

- Less liquid positions could arise from both market events and bank-related situations, for example concentrated positions and/or stale positions.
- Banks shall consider the need for making value adjustments for less liquid positions and review their continued suitability on an ongoing basis;
- Banks shall consider several factors when determining whether a value adjustment is necessary for less liquid positions. These factors include the amount of time it would take to hedge the position/risks within the position, the volatility and average of bid/offer spreads, the availability of market quotes and the volatility and average of trading volumes, market concentrations, the aging of positions, the extent to which valuation relies on marking to model, and the impact of other model risks.

- When marking to model or, in the case of the valuation of units or shares in collective investment schemes using third party valuations, banks shall consider whether to apply a supervisory valuation adjustment.

ANNEX B: INSTRUCTIONS FOR CALCULATING GENERAL RISK FOR POSITIONS IN DEBT SECURITIES

1. Maturity method

The procedure for calculating capital requirements against the position risk for debt securities is composed of the following ten steps.

STEP I: Calculation of the net position in each issue

Banks could have the following on-balance-sheet or off-balance-sheet positions in respect of each issue:

I.1 On-balance-sheet positions

a) Long positions
b) Short positions

I.2 Off-balance-sheet positions

I.2.1 Derivatives with underlying security:

a) Long positions
b) Short positions

I.2.2 Derivatives without underlying security:

a) Long positions
b) Short positions

I.2.3 Other off-balance-sheet transactions:

a) Long positions
b) Short positions

I.3 Total supervisory trading book

a) Long positions
b) Short positions

In order to calculate the net position in each issue, the following criteria shall be adopted:

i) First, positions in the same category of transactions with the opposite sign shall be offset;

ii) Where, after offsetting pursuant to point a), category 2) (off-balance-sheet positions) contains positions with the opposite sign, these shall be offset and the residual unmatched amount allocated to the type with the largest absolute value;

iii) Where, after offsetting pursuant to point b), category 1) (on-balance-sheet positions) and category 2) (off-balance-sheet positions) contain positions with the opposite sign, these shall be offset and the residual unmatched amount allocated to the type with the highest absolute value.

STEP II: Assignment of net positions in each issue to the appropriate maturity bands and weighting the positions

II.1 On the basis of the residual maturity, each net position[24] shall be assigned to one of the maturity bands specified below.

There are thirteen maturity bands for debt securities with a coupon of 3% or more and fifteen maturity bands for debt securities with a coupon of less than 3%.

II.2 Within each maturity band, the net long positions and net short positions shall be summed to obtain a net long position and net short position for the maturity band.

II.3 The long and short positions of each maturity band shall be multiplied by the appropriate risk weight.

[24] This is calculated for each issue.

Table 1

Zones	Maturity bands		Risk weights
	Coupon of 3% or more	**Coupon of less than 3%**	
Zone 1	up to 1 month	up to 1 month	0%
	over 1 month to 3 months	over 1 month to 3 months	0.20%
	over 3 months to 6 months	over 3 months to 6 months	0.40%
	over 6 months to 1 year	over 6 months to 1 year	0.70%
Zone 2	over 1 year to 2 years	over 1 year to 1.9 years	1.25%
	over 2 years to 3 years	over 1.9 year to 2.8 years	1.75%
	over 3 years to 4 years	over 2,8 years to 3.6 years	2.25%
Zone 3	over 4 years to 5 years	over 3.6 years to 4.3 years	2.75%
	over 5 years to 7 years	over 4.3 years to 5.7 years	3.25%
	over 7 years to 10 years	over 5.7 years to 7.3 years	3.75%
	over 10 years to 15 years	over 7.3 years to 9.3 years	4.50%
	over 15 years to 20 years	over 9.3 years to 10.6 years	5.25%
	over 20 years	over 10.6 years to 12 years	6.00%
		over 12 years to 20 years	8.00%
		over 20 years	12.50%

STEP III: Offsetting within maturity bands

- The weighted long position shall be offset against the weighted short position in each maturity band.
- The smallest weighted long or short position shall be the matched weighted position for the maturity band.
- The difference between the two positions shall be the unmatched weighted long (short) position for the maturity band.

STEP IV: Calculation of the capital requirement for matched positions within a maturity band

- The first capital requirement is calculated by multiplying the sum of the matched weighted positions for each band by a vertical disallowance factor of 10%[25].

STEP V: Offsetting within a zone

- For each zone the unmatched weighted positions with the same sign in the maturity bands in the zone shall be summed in order to calculate the overall weighted long position and the overall weighted short position for each zone.
- The smaller of the two shall be the matched weighted position for the zone.
- The difference between the two shall be the unmatched long (short) position for the zone.

STEP VI: Calculation of the capital requirement for matched positions within a zone

- The second capital requirement shall be calculated by multiplying the matched weighted positions for each zone by the disallowance factors specified in Table 2 of this Annex and then summing the three amounts obtained.

STEP VII: Offsetting between zones

- The unmatched weighted positions in the three zones shall be offset by matching the position in zone 1 with that in zone 2 and matching the resulting position with that in zone 3.

  Specifically the comparison of zone 1 and 2 can generate two possible outcomes:

  i) The unmatched weighted positions of zones 1 and 2 have the opposite sign;
  ii) The unmatched weighted positions of zones 1 and 2 have the same sign.

VII.1 In the first case, the unmatched weighted positions of zone 1 and 2 shall be offset.

The smaller of the unmatched weighted positions shall be the matched weighted position between zone 1 and zone 2.

[25] For example, if the sum of the weighted long positions in a maturity band is 100 million and the sum of the weighted short positions is 90 million, the vertical disallowance will be equal to 10% of 90 million, or 9 million.

The difference between the unmatched weighted positions of zone 1 and zone 2 shall be assigned to either zone 1 or zone 2 depending on which has the unmatched weighted position with the largest absolute value.

Where this latter difference and the position of zone 3:

i) Have the same sign, their sum shall be the "final unmatched weighted position";
ii) Have the opposite sign, the smaller of those values shall be the matched weighted position between zone 1 and zone 3 or the matched weighted position between zone 2 and zone 3 depending on whether the unmatched weighted position between zone 1 and zone 2 was assigned to zone 1 or zone 2, respectively. The difference between the two positions shall be the final unmatched weighted position.

VII.2 In the second case, two further cases shall be distinguished:

- Where the unmatched weighted position of zone 3 has the same sign, the sum of the unmatched weighted positions shall be the final unmatched weighted position;
- Where the unmatched weighted position of zone 3 has the opposite sign of that of zones 1 and 2, the unmatched weighted positions of zone 2 and 3 shall be offset.
- The smaller unmatched position shall be the matched weighted position between zones 2 and 3.
- The difference between the two positions, representing the unmatched weighted position between zones 2 and 3, shall be assigned to the zone with the unmatched weighted position with the largest absolute value. Where the latter position:
  i) Is assigned to zone 3 and therefore has the opposite sign of that for zone 1, the smaller of these amounts shall be the matched weighted position between zones 1 and 3. The difference between the two positions shall be the final unmatched weighted position;
  ii) Is assigned to zone 2 and therefore has the same sign as zone 1, the sum of the two unmatched weighted positions shall be the final unmatched weighted position.

STEP VIII: Calculation of the capital requirement for matched positions between zones

- The third capital requirement shall be calculated by multiplying the matched weighted positions between the three zones by the disallowance factors specified in Table 2 of this Annex and then summing the three amounts obtained.

STEP IX: Calculation of the capital requirement for residual unmatched positions

- The fourth and final capital requirement calls for a 100% weighting of the final unmatched weighted position calculated as specified above.

STEP X: Calculation of the total capital requirement

- The total capital requirement shall be the sum of the four requirements specified in steps IV, VI, VIII and IX.

Table 2

Zones	**Maturity band**	**Within the zone**	**Between adjacent zones**	**Between zones 1 and 3**
Zone 1	from 0 to 1 month from 1 to 3 months from 3 to 6 months from 6 to 12 months	40%	40%	
Zone 2	from 1 to 2 years from 2 to 3 years from 3 to 4 years	30%		100%
Zone 3	from 4 to 5 years from 5 to 7 years from 7 to 10 years from 10 to 15 years from 15 to 20 years over 20 years	30%	40%	

2. Duration method

In order to calculate the capital requirement for general risk on debt securities with the duration method, the following procedure shall be adopted:

a) Calculate the modified duration of each debt instrument and then allocate them to the 15 time-bands of the ladder specified in Table 3 of this Annex;

b) Multiply the amount by the specific weights (between 0.6% and 1%) expressing the assumed change in yield for instruments with the same modified duration;

c) Apply a vertical disallowance of 5% to the weighted long and short positions in each time-band in order to capture basis risk;

d) Carry forward the net positions in each time-band for horizontal offsetting, applying the disallowances specified in Table 2 of this Annex and proceeding in accordance with steps V to IX in section 1 of this Annex;

e) Calculate the total capital requirement as the sum of the three requirements specified in steps VI, VIII and IX and the requirement specified in point 3) above.

Table 3

Zones	Time-bands	Assumed change in yield %
Zone 1	up to 1 month	1.00
	from 1 to 3 months	1.00
	from 3 to 6 months	1.00
	from 6 to 12 months	1.00
Zone 2	from 1.0 to 1.9 years	0.90
	from 1.9 to 2.8 years	0.80
	from 2.8 to 3.6 years	0.75
Zone 3	from 3.6 to 4.3 years	0.75
	from 4.3 to 5.7 years	0.70
	from 5.7 to 7.3 years	0.65
	from 7.3 to 9.3 years	0.60
	from 9.3 to 10.6 years	0.60
	from 10.6 to 12 years	0.60
	from 12 to 20 years	0.60
	over 20 years	0.60

ANNEX C: CAPITAL REQUIREMENT FOR THE SPECIFIC RISK ON DEBT SECURITIES

Categories	**Specific risk capital requirement**
a) Debt securities issued or guaranteed by central governments, issued by central banks, international organisations, multilateral development banks or local authorities which would receive a 0 % risk weight under the rules for the risk weighting of exposures under credit risk regulations.	0%
b) Debt securities issued or guaranteed by central governments, issued by central banks, international organisations, multilateral development banks or local authorities which would receive a risk weight of 20% or 50% under the rules for the risk weighting of exposures under credit risk regulations. c) Debt securities issued or guaranteed by supervised institutions which would qualify for credit quality step 1 or 2 of the standardised approach under credit risk regulations. d) Debt securities issued or guaranteed by supervised institutions which, regardless of their original maturity, would qualify for credit quality step 3 of the standardised approach under credit risk regulations that have an original maturity of three months or less. e) Debt securities issued or guaranteed by corporate which would receive a risk weight of 20% or 50% under credit risk regulations. f) Other qualifying items in accordance with thedefinition	0.25% (residual maturity 6 months or less) 1.00% (residual maturity greater than 6 and up to and including 24 months) 1.60% (residual maturity exceeding 24months)

following this table.	
g) Debt securities issued or guaranteed by central governments, issued by central banks, international organisations, multilateral development banks or local authorities which would receive a 100% risk weight under credit risk regulations. h) Debt securities issued or guaranteed by supervised institutions which would receive a 100% risk weight under credit risk regulations. i) Debt securities issued or guaranteed by corporate which would receive a risk weight of 100% under credit risk regulations. j) Debt securities by persons for which a credit assessment by a nominated ECAI is not available.	10%/15%
k) Debt securities issued or guaranteed by central governments, issued by central banks, international organisations, multilateral development banks or local authorities which would receive a 150% risk weight under credit risk regulations. l) Debt securities issued or guaranteed by supervised institutions which would receive a 150% risk weight under credit risk regulations. m) Debt securities issued or guaranteed by corporate which would receive a risk weight of 150% under credit risk regulations.	15%/22.5%

For the purposes of Table 1, “other qualifying items” shall include:

a) Long and short positions in assets qualifying for a credit quality step corresponding to investment grade within the framework of the standardized approach under credit risk regulations;
b) Long and short positions in assets qualifying for a credit quality step corresponding to investment grade within the framework of the internal ratings based approach under credit risk regulations:
c) Long and short positions in assets for which a credit assessment by a nominated ECAI is not available and which meet the following conditions:
    i) They are considered by the banks concerned to be sufficiently liquid;
    ii) They are considered by the banks concerned to be investment grade;
d) Long and short positions in assets issued by supervised institutions subject to capital adequacy requirements.
e) Long and short positions in assets issued by supervised institutions which receive a risk weight of 50% under credit risk standardized approach.