CENTRAL BANK OF NIGERIA

Guidance Note on the Calculation of Capital Requirement for Market Risk

Standardised Approach

Table of Contents

List of tables:

1 Introduction

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 for estimating capital requirement for market risk. The capital requirement, takes into account both on- and off-balance sheet positions that are subject to market risk. <u>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.</u>

Market risk is the risk of losses in on- and off-balance sheet positions[1] arising from movements in market prices. Market risk includes:
  a) Interest rate risk;
  b) Equity position risk;
  c) Foreign exchange risk; and
  d) Commodity risk.

Capital requirement will be computed using the Standardised Approach. Under this approach, banks are to compute their capital requirements using a building-block approach, by summing up the capital requirement for individual risks mentioned above.

A bank shall calculate its market risk taking into account the risk of losses in:
  a) bank's trading book position held in:
  i. debt securities;
  ii. debt and interest rate related derivative contract;
  iii. equity; and
  iv. equity related derivative contract

  b) bank's position (in trading book and banking book) held in:

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[1] Position risk on account of options is computed separately and aggregated with respective risk to which the underlying exposure belongs, like interest rate risk, equity position risk, foreign exchange risk or commodity risk.

i. foreign exchange (including gold);
ii. foreign exchange rate related derivative contract;
iii. commodity; and
iv. commodity related derivative contract;

A bank will not include a position in calculation of market risk if the position is:
a) a credit derivative contract in bank's trading book treated as a hedge to a credit exposure in the banking book;
b) an exposure required to be deducted from bank's capital;

2 Position risk in trading book

A bank will use fair value of its positions, based on marked-to-market or marked-to-model methodology, to calculate its market risk capital charge. A bank shall allocate to the trading book any position in a financial instrument or commodity which is held with trading intent or hedge other positions held in the trading book.

The market risk is assessed on positions in the trading book and it consists of the following two components:
a) **Specific risk** means the risk of loss in value of bank's trading book positions arising from changes in prices of debt securities, equities and their related derivative contracts owing to factors related to the issuers of such debt securities, equities or the underlying instruments held in the trading book;
b) **General risk** means the risk of loss (arising from changes in interest rate, equity prices, exchange rate and commodity prices in the value of a bank's trading book positions held in debt securities, equities, foreign exchange (including gold), commodities and other related derivative contracts.

The table 1 below summarises the specific risk and general risks inherent in cash position in instruments and derivatives.

Table 1Position risk in trading book

Risk type	(Both long and short position)
Specific risk	Trading book positions in debt and equity securities and their related derivative contracts
General risk	i. Trading book position in debt and equity securities and debt-related and interest rate related derivative contracts; ii. Interest rate exposures arising from trading book positions in equity related derivative contract; iii. Interest rate exposures arising from foreign exchange derivative positions (in the entire book). iv. Interest rate exposure arising from commodity related derivative contracts (in the entire book).

3   Interest rate risk

A bank shall calculate its market risk capital requirement for interest rate risk by:
   a)   identifying the positions in its trading book which have interest rate risk;
   b)   allocating the positions into individual currency portfolios;
   c)   for each currency portfolio –
      i.   calculating the net positions in accordance with paragraph 3.3;
      ii. including these net positions in the calculation of its specific risk capital requirement after applying any offsets allowed according to paragraph 3.5;
      iii. including these net positions in the calculation of its general market risk capital charge; and
   d)   summing up all specific risk and general market risk capital charges for each currency portfolio;

3.1   Scope

In calculating its market risk capital charge for interest rate risk, a bank shall include all its trading book positions, whether long or short, in instruments (including derivatives and off-balance sheet instruments) whose market values are affected by changes in interest rates. This includes positions in any interest rate-related instrument that is sold or lent under security financing transactions (SFT) (repo, etc.), but excludes any interest rate-related instrument that is bought or borrowed under an SFT (reverse repo, etc.).

A bank will exclude the positions in the following instruments for assessment of market risk-

    i.   convertible bond which has been included in the equity position risk;

   ii.   capital investment that is deducted in the calculation of eligible capital; or

  iii.   option which is accounted for under section7 on "Treatment of options"

3.2   Measurement of position with interest rate risk

A bank shall use the current market value of its positions in interest rate-related instruments to calculate its market risk capital charge for interest rate risk.

a)   A bank shall convert its interest rate-related derivatives into notional positions in specific-risk-free securities (zero-specific risk) and use the current market values of the specific-risk-free securities to calculate its market risk capital charge for interest rate risk.

b)   A bank shall convert its credit derivatives into notional positions in the relevant reference assets and use the current market values of the reference assets to calculate its market risk capital charge for interest rate risk, except in the case of credit linked notes, where the current market value of the notes shall be used.

3.3   Netting of matched positions

A bank will net its positions (long and short positions) in debt securities or notional positions in specific-risk-free securities for calculating specific risk and general risk capital charge. A bank will net:

a)   long and short positions(including any notional positions) in identical issues (even though the issuer is the same, no netting will be permitted between different issues since differences in coupon rates, liquidity, call features, etc. mean that prices may diverge in the short run.); and

b)   a matched position in a futures contract or forward contract and its corresponding cash position in the trading book[2] (**Annexure F – illustrative example**);

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[2] A notional position in zero-specific-risk free security for interest rate risk is created by representing the cash flows with settlement date as maturity.

A bank may net opposite positions in the same category of debt securities, notional position in <u>specific-risk-free</u> securities or interest rate-related derivative contracts if:

a)   the positions relate to the same instruments;

b)   the positions are of the same notional value; and

c)   the positions are denominated in the same currency; and –

  i.   in the case of futures contracts, the offsetting positions in the notional or underlying instrument to which the futures contract relates, are for identical products and mature within seven days of each other;

  ii.   in the case of swaps and FRAs, the reference rates (for floating rate positions) are identical and the coupons are closely matched (i.e. within15 basis points); and

  iii. in the case of swaps, FRAs and forwards, the next interest fixing date or for fixed coupon positions or forwards, the residual maturity, corresponds as follows:

   1.   on the same day, if the next interest fixing date or residual maturity is less than one month;

   2.   within seven days, if the next interest fixing date or residual maturity is between one month and a year; or

   3.   within30 days, if the next interest fixing date or residual maturity is more than a year;

3.4   Offset of positions hedged by credit derivatives

a) Offsetting in full

A bank may fully offset its position in derivative contract against a cash position (in trading book) in similar instrument which is identical to underlying asset in derivative contract. Similarly, a position in a derivative contract may fully offset a position in another derivative contract where the values of the two positions (one being long and another being short) always move in opposite directions and broadly to the same extent. This will be the case when:

  i.   the two legs consist of identical instruments;

  ii.   a long cash position is hedged by a total rate of return swap (or vice versa) and there is an exact match between underlying asset(in the credit derivative contract)

and the cash position and notwithstanding that the maturity of the total return swap may be different from that of the cash position.

When a bank has fully offset its position in the credit derivative contract against a cash position in underlying instrument in the trading book, no specific risk capital charge is required to be calculated in respect of those positions.

Example of full offset of cash position against credit derivative position (position in underlying asset):

A bank has a long (cash) position in a corporate bond for N 5 billion (face value), in its credit portfolio. The bank also purchased credit protection, for the same long position (for N 5billion) in the corporate bond, under a credit default swap for same amount.

<u>*Working:*</u>

1. Cash position in the instrument – long position in corporate bond
2. Underlying asset in credit default swap – corporate bond (purchase of protection)
3. Amount (face value) of cash position = amount of underlying asset in credit default swap = N 5 billion

Bank's long cash position is fully offset by purchase of protection under credit default swap resulting in no position in the corporate bond instrument.

b) Offsetting by 80%

A bank may offset 80% of specific risk capital charge of its position in credit derivative contract against a position in underlying instrument in its trading book where the values of the two positions (being long and short positions) always move in the opposite directions but not broadly to the same extent.

In order to be eligible for offsetting by 80%, the following conditions must be satisfied:
   a)   A long cash position is effectively hedged by a credit default swap or credit linked note (or vice versa) and there is an exact match between:
   i. the reference asset and the underlying instrument (i.e. the cash position);

ii. the maturities of both the reference asset and the underlying instrument; and,

iii. the currencies of the two offsetting positions;

b) The key features of the credit derivative contracts (e.g. credit event definitions, settlement mechanism) do not cause the price movement of these derivative instruments to materially deviate from the price movement of the position in the cash position; and

c) The credit default swap or the credit linked notes transfers credit risk effectively taking account of any restrictive payment provisions (including fixed pay outs and materiality threshold).

Where the above conditions are satisfied and a bank offsets its positions in a derivative contract:

a) only 20% of specific risk capital charge is required to be calculated for the position with higher specific risk; and

b) Specific risk capital charge to be calculated for the other position will be zero.

c) Partial offsetting

A bank may partially offset its position in derivative contract against a cash position when the values of the two legs (similar but not identical) usually move in opposite directions and where:

1. There is an asset mismatch between the reference asset and the underlying instrument (i.e. cash position) and:

i. the reference asset ranks pari-passu with or is junior to the position in underlying instrument; and

ii. the reference asset and the underlying instrument are issued by the same issuer and legally enforceable cross default or cross default acceleration clauses are included in the terms of the positions in the reference asset and underlying instrument;

2. there is a currency or maturity mismatch between the contract and the position in underlying instrument; and

3. there is a mismatch between underlying instrument and reference asset in the contract and the position in the underlying instrument is included in one of the deliverable assets specified in the contract;

Where the above conditions are satisfied, a bank will apply specific risk capital charge for a position having higher specific risk and specific risk capital charge for the other position will be zero.

3.5 Specific risk capital charge

A bank shall compute specific risk capital charge for each of the net positions (actual as well as notional) in debt securities, debt-related derivative contracts, credit derivatives and delta-weighted position of options. However, notional positions in specific-risk-free securities (e.g. interest rate and currency swaps, FRAs, forward foreign exchange contracts, interest rate futures and futures on an interest rate index) do not attract specific risk capital charge.

Example:
 Notional position in specific-risk-free security and treatment of specific risk charge:

A bank, under a swap contract, is receiving fixed annual interest of 12% p.a. and paying floating rate linked to 3 month NIBOR. The swap has a remaining maturity of 3 years.

Working:
For computation of market risk under Standardised Approach, the swap will be converted into a long position in a fixed rate bond with 12% interest rate with 3 years maturity and a short position in a floating rate bond with 3 month maturity (up to next reset date).
Both bonds are specific-risk-free instruments and no specific risk will be computed for positions in the long fixed rate bond and short floating rate bond.

A bank, for the purpose of computing specific risk capital charge, shall:
   a) assign those positions into classes based on credit quality grades and residual maturities specified in the table 2 below;
   b) Multiply those positions by appropriate specific risk capital charge factors specified in the table; and
   c) Calculate the total specific risk capital charge as the sum of specific risk capital charge of each of those positions.

Table 2 Specific risk capital charge factors

Security class	Risk weight	Residual maturity (M)	Specific risk capital charge factors
Debt securities issued/guaranteed by Central government, Central bank or MDBs that qualify for risk weight under credit risk regulations.	0%	All maturities	0%
	20% to 50%	M<= 6 month	0.25%
		6 month<M<= 24 month	1.00%
		Maturity > 24 months	1.60%
	100%	All maturities	8%
	150%	All maturities	12%
Debt securities issued/guaranteed by State government or local authorities that qualify for risk weight under credit risk regulations	20% to 50%	M<= 6 month	0.25%
		6 month<M<= 24 month	1.00%
		Maturity > 24 months	1.60%
	100%	All maturities	8%
	150%	All maturities	12%
Debt securities issued or guaranteed by supervised institutions which would qualify for risk weight in Standardised Approach under credit risk regulations.	20% to 50%	M<= 6 month	0.25%
		6 month<M<= 24 month	1.00%
		Maturity > 24 months	1.60%
	100%		8%
	150%		12%
Debt securities issued or guaranteed by corporate which would receive a risk weight under credit risk regulations.	20% to 50%	M<= 6 month	0.25%
		6 month<M<= 24 month	1.00%
			1.60%
		M> 24 months	
	100%		8%
	150%		12%
Other qualifying securities		M<= 6 month	0.25%

		6 month<M<= 24 month M> 24 months	1.00% 1.60%
Debt securities by persons (including legal entity) for which a credit assessment by an ECAI is not available.		All maturities	8%

For the purposes of the above table, "other qualifying securities" shall include positions satisfying any one of the following conditions:

a) security which has a credit quality grade of "2" or above within the framework of the standardized approach under credit risk; or

b) security issued by supervised institutions which receive a risk weight of 50% or less (higher grade) under credit risk standardized approach;

c) security for which a credit assessment by a nominated ECAI is not available and which is considered by the concerned bank to be-

    i.   sufficiently liquid; and

    ii.   of investment grade

3.6   General risk capital charge

The general risk capital requirement is intended to capture the risk of loss arising from changes in market interest rates. A bank shall calculate the general risk capital charge for the portfolios by applying either the maturity method or the duration method (subject to CBN approval) to calculate the general risk capital charge for interest rate portfolios. General risk capital charge for foreign currency portfolio will be computed separately using one of the above approaches.

A bank shall use separate maturity ladders for positions in each currency, with capital charges calculated separately for each currency and then summed, with no offsetting between positions of different currencies. Where business in one or more currencies is insignificant, known as residual currency, the bank may construct a single maturity ladder for those

currencies and record, within each appropriate time band, the net long or short positions in each currency, rather than having to use separate maturity ladders for each currency. The bank shall sum the absolute value of the individual net positions within each time band, irrespective of whether they are long or short positions, to produce a gross position figure.

In each method, positions are allocated across a maturity ladder and the capital charge is calculated as the sum of three components:

    a)   a small proportion of the matched positions in each time band (the 'vertical disallowance');

    b)   a larger proportion of the matched positions across different time bands (the 'horizontal disallowance'); and

    c)   the net short or long weighted position across the whole trading book;

Vertical disallowance is designed to capture the basis risk. It is the risk that the relationship between changes in prices of similar instruments, even in same time zone, is not stable over time. Horizontal disallowance on the other hand captures the imperfect correlation of interest rates along the yield curve, applicable to securities in different time zones.

3.6.1 Maturity method

In the maturity method, long or short positions in debt securities and interest rate exposures, including derivative instruments, are entered into a maturity ladder comprising thirteen time bands (or 15 time bands in the case of low-coupon instruments, i.e. coupon of 3% and below) (refer to Table 3). A bank shall allocate fixed-rate instruments according to the residual term to maturity and floating-rate instruments according to the residual term to the next repricing date. Zero-coupon bonds and bonds with a coupon of less than 3% must be entered according to the time bands set out in the second column of Table 3 below. A bank may omit from the interest rate maturity framework opposite positions of the same amount in the same issue (but not different issues by the same issuer) and closely matched swaps, forwards, futures and forward rate agreements (FRAs) that comply with paragraph 3.3 above.

To calculate the general risk capital charge using the maturity method, a bank shall:

a)   multiply long and short position in interest rate exposure in each time band by the risk-weight corresponding to the position's time band (refer to Table 3 below); then

b)   offset the total risk weighted long and short positions in each time band to produce a single risk weighted long or short position in each time band; then

c)   offset the weighted longs and shorts within each zone (refer to Table 4), using only positions that have not been already offset under (b); then

d)   offset the weighted longs and shorts between zones using positions that have not already been offset under (b) and (c);

The net amount remaining is the net position.

Table 3 Time bands and risk weights

Coupon 3% or more	Coupon less than 3% or the duration method	Risk weight (%)	Assumed changes in yield (%)
1	2	3	4
1 month or less	1 month or less	0.00	1.00
Over 1 and up to 3 months	Over 1 and up to 3 Months	0.20	1.00
Over 3 and up to 6 months	Over 3 and up to 6 months	0.40	1.00
Over 6 and up to 12 Months	Over 6 and up to 12 months	0.70	1.00
Over 1 and up to 2 years	Over 1 and up to 1.9 Years	1.25	0.90
Over 2 and up to 3 years	Over 1.9 and up to 2.8 years	1.75	0.80
Over 3 and up to 4 years	Over 2.8 and up to 3.6 years	2.25	0.75
Over 4 and up to 5 years	Over 3.6 and up to 4.3 years	2.75	0.75
Over 5 and up to 7	Over 4.3 and up to 5.7	3.25	0.70

years	years		
Over 7 and up to 10 years	Over 5.7 and up to 7.7 years	3.75	0.65
Over 10 and up to 15 years	Over 7.7 and up to 9.3 years	4.50	0.60
Over 15 and up to 20 years	Over 9.3 and up to 10.6 years	5.75	0.60
Over 20 years	Over 10.6 and up to 12 Years	6.00	0.60
	Over 12 years to 20 years	8.00	0.60
	Over 20 years	12.50	0.60

Vertical disallowance- A bank shall then calculate the vertical disallowances for each time band as 10% of the offsetting positions (being smaller of the two opposite positions), whether long or short. The vertical disallowance is computed when a bank has offsetting long and short positions in the same time bucket. The opposite positions do not offset interest rate risk completely due to basis risk (positions mapped to different interest rate indices) and capital, in the form of vertical disallowance, should be maintained for the residual interest rate risk (to the extent of no offsetting).

Horizontal disallowance- The horizontal disallowance is computed when a bank has offsetting (opposite) long and short positions in the adjacent time buckets. Horizontal disallowance arises due to unequal changes in yield curve for different time buckets at the same time period. A bank must then calculate the horizontal disallowances as the sum of:
   a)   40% of the offsetting positions within zone 1;
   b)   30% of the offsetting positions within zones 2 and 3; and
   c)   40% of the offsetting positions between zones 1 and 2, and between zones 2 and 3.
   d)   100% of the offsetting positions between zones 1 and 3.

Table 4Horizontal disallowances

Zone	Time band	Within the zone	Between adjacent zone	Between zone 1 and 3
1	2	3	4	5
Zone 1	0 - 1 month 1- 3 month 3 – 6 month 6 – 12 months	40%	40%	100%
Zone 2	1 - 2 year 2 – 3year 3 – 4 year	30%	40%	100%
Zone 3	4 – 5 year 5 – 7 year 7 – 10 year 10 –15 year 15 –20 years	30%		100%

The bank shall calculate the market risk capital charge for general risk as the sum of:

   a)   vertical disallowance;
   b)   horizontal disallowance;
   c)   net unmatched positions (long or short);

3.6.2   Duration method

A bank may, with prior approval of the CBN, adopt the duration method to measure general risk by calculating the price sensitivity of each position separately. A bank which elects to use this method shall do so consistently, unless a change in method is approved by the CBN.

A bank, applying the duration method, shall:

   a)   calculate the duration of each instrument;
   b)   slot each net position into the appropriate duration band according to the modified durations of the instruments;

c)   calculate the weighted long and short position for each duration band by multiplying the net positions by the modified duration of the position and the relevant assumed change in yield (column 4 of table 3);

d)   calculate vertical disallowances for each time band as 5% of the offsetting positions, whether long or short;

e)   Carry forward the net position in each time band for horizontal offsetting subject to disallowance as carried out in the maturity method.

4   Equity position risk

4.1   Scope

A bank will compute specific risk capital charge and general risk capital charge for each of its positions (whether long or short) in equities and equity related derivative contracts except positions deducted from capital and equity options (included in section 7 on the treatment of options) .

4.2   Measurement of position with equity position risk

A bank shall use the current market value of its cash positions in equity instruments to calculate its market risk capital charge for equity position risk. The bank shall convert its equity derivative instruments into notional positions in the relevant underlying equity instruments and use the current market value of the underlying instruments to calculate its market risk capital charge for equity position risk.

A bank shall calculate its market risk capital requirement for equity position risk by:
   a)   identifying the positions in its trading book which have equity position risk;
   b)   calculating the net positions (long or short) in each equity instrument and equity index;
   c)   computing the net long position as sum of all long positions in equities;
   d)   computing the net short position as sum of all short positions in equities;

e) computing the equity position for specific risk as sum of absolute values long and short position (long position + Absolute(short position))

f) specific market risk charge for equity = Equity position for specific risk * specific risk capital charge factor

g) computing the equity position for general risk as the net of long position and short position (long position – Absolute (short position))

h) General market risk charge for equity = equity position for general market risk * general market risk charge factor.

Positions in different equity markets or countries will be treated as separate portfolio and capital charge for equity positions in these markets/countries will be computed separately.

A bank shall treat positions in futures contract or forward on a single equity as a notional position in that equity[3].

4.3   Netting of matched positions

For the purpose of calculating the specific risk and general risk capital charge for its equity positions, a bank may net a long and a short position (including notional positions) in an identical equity or equity index in the same equity portfolio. **No netting is allowed between positions in equity, equity derivatives or equity indices in different market or country.**

4.4   Specific risk capital charge

A bank shall compute specific risk capital charge for each of its positions in an equity instrument by multiplying the gross amount (Gross long position plus Absolute gross short position) with specific risk capital charge factor of 8%.

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[3] A notional position in zero-specific-risk free security for interest rate risk is created representing the cash flows with settlement date of the derivative as the maturity date.

4.5 General risk capital charge

A bank will compute general risk capital charge for equity position risk by summing the net positions(Gross long position minus Absolute gross short position)) in equities, equity indices (including delta-weighted position on equity and equity indices) in the same equity market and then by multiplying the resultant amount by general risk capital charge factor of 8%.

4.6 Market risk for qualifying equity indices

In addition to general risk charge for equity position risk, a bank will apply an additional risk charge of 2% on net short or long position in a qualifying equity index (as notified by CBN from time to time). This is required to cover execution risk.

5 Foreign exchange risk

5.1 Scope

A bank shall calculate its net open position in each currency by summing:

a) the net spot positions (i.e. all asset items less all liability items, including accrued interest and accrued expenses, denominated in the currency in question);

b) the net forward positions (i.e. all amounts to be received less all amounts to be paid under forward foreign exchange transactions, including currency futures and the principal on currency swaps, if not included in the spot position);

c) guarantees and other similar instruments denominated in foreign currency which are certain to be called and are likely to be irrevocable;

d) net future incomes or expenses not yet accrued but already fully hedged, as may be determined by the bank;

e) any other item representing a profit or loss in foreign currency; and

f) the net delta-weighted positions of foreign currency options in interest rate, equity, foreign exchange and commodity instruments, where the bank is using the delta-plus method, for computation of market risk capital charge for options;

A bank shall convert its foreign currency derivative instruments and derivative positions in gold into notional positions in the relevant foreign currency and in gold for computing market risk capital charge for foreign exchange risk.

5.2   Net open position (using Short-hand method)

A bank shall calculate its net open position of the overall foreign currency assets and liability by –

a)   identifying the positions which have foreign exchange risk;

b)   calculating the net open position in each currency in accordance with paragraphs 5.1 above and the net gold position;

c)   converting the net open position in each currency and the net gold position into naira equivalent (the base currency) at prevailing foreign exchange spot rates;

d)   computing the overall net open position (**using Short-hand Method**) by–

    i.   calculating the aggregate long position by summing exposures in currencies having long positions; and

    ii.   calculating the aggregate short position by summing exposures in currencies having short positions; and

    iii.   selecting the higher of absolute values of aggregate long position and aggregate short position;

5.3   Capital charge for foreign exchange risk

A bank shall calculate its market risk capital charge for foreign exchange risk for its positions in foreign exchange (including gold) and exchange rate related derivative contracts by summing –

    i.   the net open position in foreign currency calculated according to Short-hand Method as detailed in paragraph 5.2 (d) above; and

    ii.   the absolute value of the net position (long or short) in gold;

And then multiply the above net open position by market risk capital charge factor of 8%.

6 Commodity risk

The commodity risk arises from holding positions in commodities such as precious (excluding gold) and base metals, agricultural products, minerals (including oil) and electricity. Holding positions in commodities is subject to extant regulations.

If a bank is exposed to interest rate or foreign exchange risk from funding commodities positions, the relevant positions must be included in the calculation of interest rate or foreign exchange risk. A bank shall convert its commodity derivative instruments into notional positions in the relevant commodities.

A bank shall measure commodities risk using either the simplified approach or the maturity ladder approach. Approval from the CBN is required for adoption of maturity ladder approach.

6.1 Scope

A bank shall include all positions, whether long or short, in trading book as well as in banking book for calculation of market risk capital charge for commodity risk except position in gold which is included in the scope of foreign exchange risk.

6.2 Measurement of position with commodity risk

A bank shall calculate its market risk capital charge for commodity risk by –

 a) identifying the positions which have commodity risk;

 b) converting each commodity position (long or short) into standard unit of measurement for that position (e.g. barrels, kilos, grams);

 c) converting each position into naira equivalent (the base currency) at the prevailing foreign exchange spot rates and the current spot price for the commodity;

 d) calculating the market risk capital charge for each commodity position according to the simplified approach or the maturity ladder approach (as approved by CBN); and

e)   aggregating the capital charge for the entire commodity portfolio;

6.3   Netting of matched positions

A bank shall offset long and short positions in the same commodity for calculating net open position in that commodity and shall not offset its position in different types of commodities.

6.4   Simplified approach

A bank shall calculate market risk capital charge for its commodity positions as the sum of:
   a)   15% of bank's net position in each commodity; and
   b)   3% of bank's gross position (long plus short) in each commodity.

6.5   Maturity ladder approach

A bank, using the maturity ladder approach, shall calculate the market risk capital requirement for each commodity by –
   a)   offsetting long and short positions, maturing –
      i.   on the same day; or
      ii.   in the case of positions arising from contracts traded in markets with daily delivery dates, within ten business days of each other;
   b)   allocating the remaining positions to the appropriate maturity time bands as per table 5 below:

Table 5 Commodity time bands

Time bands
1 month or less
Over 1 month and up to 3 months
Over 3 months and up to 6 months
Over 6 months and up to 12 months
Over 1 year and up to 2 years
Over 2 years and up to 3 years
Over 3 years

c)   Matching the long and short positions within each time band. In each instance, calculating a spread charge equal to the sum of long and short position multiplied by the spread rate of 1.5%.

d)   carrying unmatched positions remaining to another time band where they can be matched, and matching them till all matching positions are exhausted, calculating;
  i.   a carry charge equal to the carried position multiplied by the carry rate of 0.6% and the number of time-bands by which the position is carried;
  ii.   a spread charge equal to the sum of long and short positions; and
  iii.   matched position multiplied by the spread rate of 1.5%;

e)   calculating the outright charge on the remaining positions (which will either be long position or short position) equal to the sum of remaining position (in absolute terms) multiplied by the outright charge of 15%;

f)   summing the capital charge on account of spread rate, carry rate and the outright charge as determined above;

7   Treatment of options

A bank must obtain prior approval of the CBN to use any of the approaches for the measuring price risk for options.
A bank:
  a)   shall use the simplified approach for the treatment of options if,
    i.   it has only purchased options in its trading book and it does not write options; or
    ii.   it writes option and all written options are perfectly hedged by perfectly matched long positions in its trading book; and

  b)   shall use the delta-plus method, where it has open position in written options;

7.1 Simplified Approach

A bank using the simplified approach shall apply the capital charges outlined in Table 6. In this approach, the positions for the options and the associated underlying assets, cash or forward, are not subject to the Standardised Approach but rather are 'carved-out' and subject to separately calculated capital charges that incorporate both general risk and specific risk. The capital charges thus generated are then added to the capital charge for the relevant category, i.e. interest rate related instruments, equities, foreign exchange and commodities.

Table 6 Simplified approach: Capital charges

Position	Treatment
Long cash and long put or Short cash and long call	The capital charge will be the market value of the underlying security multiplied by the sum of specific and general risk capital charges for the underlying less the amount, the option is in the money (if any) bounded at zero. The charge for currency option will be 8% and for options in commodities 15%
Long call or Long put	The capital charge will be the lesser of: a)the market value of the underlying security multiplied by the sum of specific and general risk capital charges for the underlying; and (b) the market value of the option;

7.2 Delta-plus approach

A bank that adopts delta-plus approach shall include delta-weighted options positions within the respective category under the Standardised Approach. The bank shall report such options as a position equal to the sum of the market values of the underlying multiplied by the sum of the absolute values of the deltas. As delta does not cover all risks associated with options positions, the bank must measure gamma (which measures the rate of change of delta) and vega (which measures the sensitivity of the value of an option with respect to a change in volatility) in order to calculate the total capital charge. These sensitivities must be calculated using an internal model or a proprietary options pricing model approved by the CBN.

Thus a bank that adopts delta-plus approach shall:

a)   incorporate delta-weighted positions of such outstanding contracts into its respective risk category (interest rate, equity, foreign exchange and commodity); and

b)   calculate the following market risk capital charge against those option positions;

   i.   specific risk and general risk capital charge for delta risk under respective risk category;

   ii.   market risk capital charge for gamma risk; and

   iii.   market risk capital charge for vega risk

Capital charge for gamma risk:

The capital charges for 'gamma risk' must be calculated as:

$$\text{Gamma impact} = \frac{1}{2} \times \text{gamma} \times (VU)$$

Where VU denotes the variation in the price of the underlying option. VU must be calculated as follows:

a)   for interest rate options, if the underlying is a bond, the market value of the underlying must be multiplied by the risk weights and treated for assumed change in yield for general risk under Standardised Approach

b)   for options on equities and equity indices, the market value of the underlying must be multiplied by the market risk capital charge factor of 8%;

c)   for options on foreign exchange and gold, the market value of the underlying must be multiplied by 8%; and

d)   For options on commodities, the market value of the underlying must be multiplied by 15%.

Each option on the same underlying will have a gamma impact that is either positive or negative. A bank must sum these individual gamma impacts, resulting in a net gamma impact for each underlying that is either positive or negative. Only those gamma impacts that are

negative are included in the capital calculation. The total gamma capital charge is the sum of the absolute value of the net gamma impacts.

Capital charge for Vega risk

To calculate Vega risk, a bank must multiply the Vega for each option by a 25% proportional shift in the option's current volatility. The results must then be summed across each underlying. The total capital charge for Vega risk is calculated as the sum of the absolute value of Vega across each underlying.

8 Annexures

8.1   Annexure A - Derivation of notional position for interest rate related derivatives

The bank shall convert futures and forwards on debt securities, interest rate forwards and forward rate agreements (FRA, interest rate swaps and foreign exchange swaps) into notional positions in:

a)   The underlying debt securities; or

b)   Notional interest rate securities to capture the pure interest rate risk, arising from future payments and receipts of cash, which are called zero-specific-risk-free securities; or

c)   Both a) and b)

8.1.1   Futures and forwards on debt security

A bank shall treat positions in forward and futures as two notional positions as follows:

Table 7 Notional position for positions in future and forward on debt security

Instrument type	Notional short position in:	Notional long position in:
Long position (purchased) in a forward or futures	a zero coupon zero-specific-risk security with a maturity equal to the expiry date of the future or forward; and	the underlying debt security;
Short position (sold) in a forward or futures	the underlying security;	a zero coupon zero-specific-risk security with a maturity equal to the expiry date of the future or forward.

8.1.2   Interest rate forwards and forward rate agreement (FRAs)

Interest rate futures or FRAs must be treated as the two notional positions (one long, one short) shown in table 8 below:

Table 8 Notional position in interest rate forwards and FRAs

Instrument type	Notional short position in:	Notional long position in:
Long position (purchased) in an interest rate future or short position (sold) in FRA	a zero coupon zero-specific-risk security with a maturity equal to the expiry date of the interest rate future or settlement date of FRA; and	a zero coupon zero-specific-risk security with a maturity equal to the expiry date of the interest rate future or settlement date of FRA plus the maturity of the notional borrowing/deposit.
Short position (sold) in a	the underlying security;	a zero coupon zero-specific-risk security with a maturity equal to the expiry date of the future or forward.

8.1.3   Interest rate swap and foreign exchange swap

A bank shall treat interest rates swap or foreign exchange swap as two notional positions as specified in table 9 below:

Table 9 Notional positions in interest rate swap and foreign exchange swap

Instrument type	Notional short position in a:	Notional long position in a:
Bank receives fixed and pays floating	Zero-specific-risk security with a coupon equal to the floating rate and a maturity equal to the next reset date.	Zero-specific-risk security with a coupon equal to the fixed rate of the swap and a maturity equal to the maturity of the swap.
Bank receives floating and pays fixed	Zero-specific-risk security with a coupon equal to the fixed rate of the swap and a maturity equal to the maturity of the swap.	Zero-specific-risk security with a coupon equal to the floating rate and a maturity equal to the next reset date.

8.2 Annexure B - Derivation of notional position on foreign currency and gold derivative instruments

8.2.1 Foreign Exchange Forwards, Futures Contracts

A bank should treat a foreign exchange forward or futures contract as two notional currency positions:

   a)   a long notional position in the currency which the bank has contracted to buy; and

   b)   a short notional position in the currency which the bank has contracted to sell.

8.2.2 Foreign Exchange swaps

A bank shall treat a foreign exchange swap as –

   a) a long notional position in the currency which the bank has contracted to receive interest and principal; and

   b) a short notional position in the currency which the bank has contracted to pay interest and principal.

8.2.3 Gold forward or future contracts

A bank shall treat a forward or futures contract on gold as a notional position in gold with a value equal to the amount of gold underlying the contract multiplied by the current spot price for gold, except in the case of a forward where the bank, may use the net present value of each position, discounted using prevailing interest rates and valued at prevailing spot rates.

8.3   Annexure C- Derivation of notional position for commodity or forward contract

A bank shall treat a forward, futures contract on a single commodity, which settles according to the difference between the price set on trade date and that prevailing at the maturity date of the contract, as a notional position equal to the total quantity of the commodity underlying the contract that has a maturity equal to the expiry date of the contract.

Where a commodity is part of a futures contract or forward, any interest rate or foreign exchange risk from the other leg of the contract, shall be reported as part of exposure under interest rate or foreign exchange sections.

8.4   Annexure D –Treatment of credit derivative in the trading book

A bank shall convert its credit derivatives into notional positions in the relevant reference assets and use the current market value of the reference assets to calculate its market risk capital charge for interest rate risk, except in the case of credit linked notes, where the current market value of the notes shall be used.

8.4.1   Treatment of the protection seller

a)   A total return swap creates a long position in reference asset and a short position in specific-risk-free security with a maturity equal to the term remaining until the next interest fixing date

b)   A credit default swap creates a long position in reference asset. If premium or interest payments are due under the swap, these cash flows must be represented as a long position in a specific-risk-free security. Where the derivative has an external rating and meets the condition for a qualifying debt item, the bank may recognise a long position in the derivative.

c)   A single-name credit linked note (CLN) creates long position in:

     i.   The reference asset specified in the note; and

     ii.   The note issuer.

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.

Table 10 Summary of Treatment of Credit Derivatives in the Trading Book

Instrument type	Risk category	Long position / protection seller	Short position / protection buyer
Credit	General risk	Long position in a zero-specific-risk security if there are any premiums or interest payments to be paid	Short position in a zero-specific-risk security if there are any premiums or interest payments to be paid

default swap	Specific risk	Long position in the reference asset, or long position in the swap if it is a qualifying debt security	Short position in the reference asset, or short position in the swap if it is a qualifying debt security
Total rate of return swap	General risk	Long position in the reference asset, and short position in a zero-specific-risk security if there are any premiums or interest payments to be paid	Short position in the reference asset, and long position in a zero-specific-risk security if there are any premiums or interest payments to be paid
	Specific risk	Long position in the reference asset	Short position in the reference asset
Single name Credit linked notes	General risk	Long position in the note issuer	Short position in the note issuer
	Specific risk	Long position in the note issuer and long position in the reference assets, or long position in the note if it is a qualifying debt security	Short position in the reference assets, or short position in the note if it is a qualifying debt security

8.4.2   Treatment of the protection buyer

For the protection buyer, the positions are determined as the mirror image of the protection seller, with the exception of a credit linked note.

8.5   Annexure E –Trading book – Policy statement, requirements, management and prudent valuation practices

A bank shall allocate all its positions to either its trading book or its banking book. For the avoidance of doubt, all positions excluded from the trading book shall be deemed to be part of the banking book.

8.5.1   Policy statement

A bank shall have a trading book policy statement which covers, at a minimum, the policies and procedures, including the methodologies, by which the bank –

a)   defines its trading book and identifies positions to be included in its trading book;

b)   allocates positions between the banking book and the trading book;

c)   actively manages and values its positions in the trading book;

d)   measures its trading book risks; and

e)   controls the transfer of positions between the banking book and the trading book;

A bank shall obtain the approval of its Board on its trading book policy statement. The bank shall review and where necessary update the policy statement, at least annually. The bank shall obtain the approval of the Board for all significant changes.

The bank shall, at a minimum, address the following in its trading book policy statement as part of defining the trading book and its strategy:

a) the activities that the bank considers to be trading and the types of positions that are to be allocated to the trading book for the purposes of calculating its regulatory capital requirements;

b) the types of positions that are excluded from the trading book; and

c) the procedures to ensure that the criteria by which positions are allocated to the trading book are adhered to on a consistent basis, including details on –

   i.   the unit or department within the bank responsible for monitoring adherence to the trading book policy statement;

   ii.   how often this monitoring is conducted;

iii.   how this monitoring is done; and

iv.   How the continuing appropriateness of allocations is confirmed.

8.5.2   Requirements of the trading book positions

A bank must allocate to the trading book, positions in financial instruments including derivative products and other off-balance sheet instruments, that are held either with trading intent or to hedge other elements of the trading book.

A position shall be considered to be held with trading intent if;

a)   it is held for short-term resale;

b)   it is taken on by a bank with the intention of benefiting in the short term from actual or expected differences between its buying and selling price, or from other price or interest rate variations; or

c)   it is taken on by a bank to lock in arbitrage profits;

d)   there is a clearly documented trading strategy for the position, instruments or portfolios that has been approved by senior management (which must include the expected holding horizon); and

e)   there are clearly defined policies and procedures for the active management of the position such that:

i.   positions are managed on a trading desk;

ii.   position limits are set and monitored for appropriateness;

iii.   Dealers have the autonomy to enter into and manage positions within agreed limits and according to the agreed strategy.

iv.   positions are marked-to-market daily and when marked-to-model, the parameters are assessed on a daily basis;

v.   positions are reported to senior management as an integral part of the bank's risk management process; and

vi.   Positions are actively monitored with reference to market information sources and assessments are made of the market liquidity or the ability to

hedge positions or the portfolio risk profile which includes assessments of the quality and availability of market inputs to the valuation process, level of market turnover and sizes of positions traded in the market.

8.5.3   Trading book management and valuation practices

The Board has the ultimate responsibility for management of market risk and must ensure that the bank has in place adequate systems to identify, measure and manage market risk, including identifying responsibilities, providing adequate separation of duties and avoiding conflicts of interest.

The trading book policy should describe, in detail, the extent of active management and prudent valuation practices including:

a)   the extent to which a position can be marked-to-market daily by reference to an active and liquid two-way market;

b)   for positions which are marked-to-model, the extent to which the bank can:-

   i.   identify the material risks of the position;

  ii.   hedge the material risks of the position; and

 iii.   derive reliable external estimates for the key assumptions and parameters used in the model;

c)   the extent to which the bank can, and is required to, generate valuations for the positions which can be validated internally or externally by an expert in a consistent manner;

d)   the extent to which the bank can, and is required to, maintain documents to support valuations of its trading book positions; and hedge out or manage risks under severe market conditions;

The bank should also consider how prudent valuation principles will be met in a stressed scenario.

The trading book policy should also lay down guidelines for transfer of securities between banking and trading books, including –

    a) the extent to which a bank may transfer positions between the banking book and the trading book and the criteria for such transfers;

    b) the procedures to effect such transfers; and

    c) The controls in place to prevent inappropriate transfers of positions between the banking book and the trading book.

8.5.4 Stress testing and scenario analysis of trading book positions:

A bank must conduct a regular programme of stress testing and scenario analysis of its trading book positions, both at the trading desk level and on a bank-wide basis. The results of these tests must be reviewed by senior management and reflected in the policies and limits set by the bank.

The bank's stress testing programme should be comprehensive in terms of both risk and coverage, and appropriate to the size and complexity of trading book positions held.

As part of the stress testing programme, the trading book policy should specify the following.

    a) The frequency of the stress testing of trading book positions (which should be determined by the nature of the positions);

    b) The stress testing should include shocks which reflect the nature of the portfolio and the time it could take to liquidate the portfolio completely or hedge the portfolio risk.

8.6   Annexure F – Netting of matched positions- illustrative example

A bank has a long cash position in 16.39% FGN Jan 2022 bond with a face value of N10 billion. The bank also entered into a forward contract to sell the same bond (value date 3 month later) for the face value of N5 billion at the rate of N110.50 for each face value of N100.

Workings:

1. Net long position of the bond (face value) = N10 billion – N5 billion (sold) = N 5 billion

2. The forward contract is fully offset.

3. Amount to be received on settlement date of the contract (after 3 months) = N5 billion x (110.50/100) = N5.525 billion which represents a long position in a specific-risk-free security due after 3 month.

New long position in specific-risk-free security = N5.525 billion with 3 month maturity.

8.7   Illustration on calculation of Market risk capital charge for commodity risk under maturity ladder approach

Assuming that a bank has the following positions in the same commodity which are converted at current spot rates into Naira, the total market risk capital requirement should be calculated as follows:

(All positions in naira '000)

Time-band	Position Spread	Capital	calculation
Up to 1 month		1.50%	
More than 1 month but not more than-3 months		1.5%	
More than 3	Long 1000	1.5%	(1) 1000 long + 1000 short (matched)

months but not more than 6 months	Short 1500		Spread charge = 2,000*1.5% = 30 (2) 500 short carried forward to 1-2 years Carry charge = 500*0.6%*2 = 6.00
More than 6 months but not more than12 months		1.5%	
More than 1 year but not more 2 years	Long 800	1.5%	(2) 500 long + 500 short (matched) Spread charge = 1000*1.5% =15 (3) 300 long carried forward to over 3 years Carry charge = 300*0.6%*2 = 3.60
More than 2 years but not more than-3 years		1.5%	
More than 3 years	Short 1000	1.5%	(3) 300 long + 300 short (matched) Spread charge = 600*1.5% = 9 (4) Net position = 700 Outright charge = 700*15% = 105
			(5) Total market risk capital requirement = 168.60

8.8   Illustration on Net Open Position for Foreign Exchange Positions

The net open position (NOP) is the aggregate position of a bank's currency risk exposure. An illustration of computation of NOP is as shown below.

A. Particulars

Where aggregate long position and the aggregate short position details are provided:

Aggregate Long Position (in Naira)	Aggregate Short Position (in Naira)
2,500,000,000	-3,000,000,000

B. Computing the NOP Under Gross Aggregate Method

Net Open Position

= ABS (Aggregate Long Position) + ABS (Aggregate Short Position)

= ABS (2,500,000,000) + ABS (-3,000,000,000)

= 2,500,000,000 + 3,000,000,000

= 5,500,000,000

C. Computing the NOP Under Net Aggregate Method

Net Open Position

= **ABS**[ABS (Aggregate Long Position) - ABS (Aggregate Short Position)]

= **ABS**[ABS (2,500,000,000) - ABS (-3,000,000,000)]

= **ABS**[2,500,000,000 - 3,000,000,000]

= ABS [-500,000,000]

= **500,000,000**

D. Computing the NOP Under the Shorthand Method

Net Open Position

= **Max**[ABS (Aggregate Long Position), ABS (Aggregate Short Position)]

= **Max**[ABS (2,500,000,000), ABS (-3,000,000,000)]

= **Max**[(2,500,000,000),(3,000,000,000)]

= **3,000,000,000**

E. Note

$$NOP_{\text{Net Aggregate Method}} < NOP_{\text{Shorthand Method}} < NOP_{\text{Gross Aggregate Method}}$$

Under circumstances where the bank does not hold any short positions then all the three (3) methods shall give the same result for NOP.

8.9 Definition of terms

- **Banking book:** Bank's on-balance sheet exposure and off-balance sheet exposure except those falling under the scope of trading book.
- **Credit derivative:** A forward contract, swap, option or similar derivative contract entered into by two parties with the intention of transfer of credit risk in relation to a reference asset from one party (protection buyer) to another party (protection seller).
- **Credit event:** In relation to a credit derivative, means an event mentioned in the contract, if it occurs, obliges the protection seller to make payment to the protection buyer.
- **Credit-linked note:** It means a form of structured note with an embedded credit default swap which allows the issuer of the note (protection buyer) to transfer credit risk to the buyer of the note (protection seller).
- **Debt related derivative contracts:** It is a forward, future, FRA, swap or option whose underlying exposure is an interest rate instrument like debt, note or loan representing the asset of a counterparty.
- **Delta:** With reference to an option, it represents a ratio of change in price of the option with change in prices of the underlying instrument. It measures the sensitivity of the option with reference to change in prices of its underlying instrument. Delta-equivalent amount represents the fair value of the underlying instrument (or notional amount) multiplied by delta.
- **Derivative contract:** It means a financial instrument (other than a bond, loan, share or note) the value of which is determined with reference to the value of one or more underlying asset, index, financial instrument or rate as mentioned in the instrument.
- **Modified duration:** The modified duration of a bond represents price sensitivity of the bond for changes in interest rates or the yield curve. It is a weighted average maturity of an instrument where the present values of the cash flows are treated as weights.

- **Equity related derivative contract:** It means a forward contract, swap, option or similar derivative contract the value of which is determined by reference to the value of one or more equity or equity index.

- **Fair value:** A fair value amount for which the asset can be exchanged between knowledgeable and willing parties in an arm's length transaction.

- **Forward contract:** It is a contract between two parties for a purchase or sale of a specified amount of commodity, currency, financial instrument or things at a future date at an agreed price.

- **Interest rate instruments:** A financial instrument whose value can be determined with reference to current or specified interest rate.

- **Interest rate related derivative contract.** It is a forward, future, FRA, swap or option whose underlying exposure is an interest rate instrument like debt, note, loan or interest rate.

- **Marked-to-market:** It means to revalue a transaction, position, exposure or contract at current market value.

- **Marked-to-model**: It represents the valuation of an exposure, position or transaction using a model whose parameters are estimated, on continuous basis, based on the market price or market factors.

- **Reference asset:** It represents, in relation to a credit derivative, a specific obligation (in the form of debt instrument, loan or note) of a reference entity (obligor) based on which the settlement under the contact are determined.

- **Repo-style transaction:** It represents a transaction carried by two counterparties whereby one party agrees to sell (buy) securities to (from) the other party for specified amount of money (at certain rate of interest) with a commitment to buy back (sell) the securities at an agreed price at a future date. It represents a transaction for collateralised borrowing/lending.

- **Total return swap:** It is a credit derivative transaction under which a protection buyer-

a) agrees to pay the protection seller all cash flows arising from the reference asset including any appreciation of market value of the reference asset; and

b) receives, in return, a spread over a specified index together with any depreciation in the value of the reference asset;

- **Trading book:** The trading book represents a bank's exposure in financial instruments which are held with the intention of trading or hedging internal exposures.

- **Underlying asset:** It represents, in relation to a credit derivative, an on-balance sheet or off-balance sheet exposure (in the form of a financial instrument or loan) of a bank whose credit risk is being transferred under the credit derivative.