(B) shall in the case of a collateralised OTC derivative transaction subject to the current exposure method, calculate its adjusted exposure in accordance with the relevant formula and requirements specified in subregulation (17).

(ix) *Comprehensive approach: formula for the calculation of a bank's adjusted exposure when the effect of a master netting agreement is taken into consideration*

A bank that applies the standard haircuts specified in subparagraph (xi) below, or its own estimated haircuts, which bank wishes to recognise the effects of bilateral master netting agreements, shall calculate its adjusted exposure through the application of the formula specified below, provided that the bank shall comply with the minimum requirements relating to bilateral netting agreements specified in subparagraph (xv) below. The formula is expressed as:

$$E^* = \max\{0, [(\sum (E) - \sum (C)) + \sum (Es \times Hs) + \sum (Efx \times Hfx)]\}$$

where:

E* is the adjusted exposure after the effect of risk mitigation is taken into consideration

E is the relevant current value of the exposure

C is the value of the relevant collateral

Es is the absolute value of the net position in a given instrument

Hs is the relevant haircut that relates to Es, that is, the net long or short position of each instrument included in the netting agreement shall be multiplied with the appropriate haircut

Efx is the absolute value of the net position in a currency that differs from the settlement currency

Hfx is the haircut in respect of the currency mismatch

The haircut that relates to currency risk shall be 8 per cent, based on a ten business day holding period and daily mark-to-market.

(x) *Comprehensive approach: formula for the calculation of a bank's adjusted exposure based on a VaR model approach*

A bank that uses a VaR model approach to reflect the price volatility of the exposure and the collateral shall calculate its adjusted exposure through the application of the formula specified below.

$E^* =$ max {0, [($\sum$ E - $\sum$ C) + VaR output from the internal model]}

where:

E* is the adjusted exposure after the effect of risk mitigation is taken into consideration

E is the relevant current value of the exposure

C is the relevant value of the collateral

VaR is the previous business day's VaR amount

(xi) Comprehensive approach: standard haircuts

Table 11: Standard haircut[1]

Issue rating in respect of debt securities	**Residual maturity**	**Sovereigns[2]**	**Other issuers**
AAA to AA-/A-1	≤ 1 year	0.5	1
	> 1 year; ≤ 5 years	2	4
	> 5 years	4	8
A+ to BBB-/ A-2/ A-3/ P-3 and unrated bank securities qualifying as eligible collateral in terms of the simple approach	≤ 1 year	1	2
	> 1 year; ≤ 5 years	3	6
	> 5 years	6	12
BB+ to BB-	All	15	
Securities issued by the Central Government of the RSA or the Reserve Bank	≤ 1 year	1	
	> 1 year; ≤ 5 years	3	
	> 5 years	6	
Main index equities, including convertible bonds, and gold		15	
Other equities, including convertible bonds, recognised on a licensed exchange		25[3]	
UCITS/ Mutual funds		Highest haircut applicable to any security in which the fund may invest	
Cash in the same currency[4]		0	

1. **Based on daily mark-to-market adjustments, daily remargining and a ten business day holding period, expressed as a percentage.**
2. **Including multilateral development banks or public-sector entities that qualify for a risk weight of zero per cent.**
3. **Also relates to instruments that are not recognised as eligible collateral in respect of exposures included in the banking book but qualify as eligible collateral for repurchase or resale agreements included in the bank's trading book – refer to subparagraph (iv)(B) above.**
4. **Including cash collateral instruments qualifying as eligible collateral in terms of subparagraphs (iii)(A) and (iii)(B) above.**

When a bank obtained collateral that consists of a basket of instruments, the haircut in respect of the basket of instruments shall be calculated in accordance with the formula specified below, which formula is designed to weight the collateral in the basket.

$$H = \sum a_i H_i$$

where:

a_i is the relevant weight of the asset, measured in terms of the relevant currency units, in the basket

H_i is the haircut applicable to the relevant asset

(xii) *Comprehensive approach: quantitative criteria relating to own estimates of haircuts*

As a minimum, a bank that wishes to calculate its own haircuts for purposes of calculating the bank's adjusted exposure-

(A) shall use a 99th percentile, one-tailed confidence interval;

(B) shall base its calculations on the requirements specified in table 12 below in respect of the type of transaction, the minimum holding period and the frequency of remargining and marking to market:

Table 12

Transaction type	Minimum holding period	Condition
Repo-style transaction	Five business days	Daily remargining
Other capital market transactions	Ten business days	Daily remargining
Secured lending	Twenty business days	Daily revaluation

When-

(i) a bank's own estimates of haircuts are based on shorter or longer holding periods than the minimum holding periods specified in table 12 above, the bank shall use the relevant square root of time formula to scale the relevant haircuts up or down to the appropriate minimum holding period;

(ii) the frequency of remargining or revaluation is longer than the minimum period specified in table 12 above, the relevant percentage in respect of the said minimum haircut shall be scaled up depending on the actual number of business days between remargining or revaluation, using the square root of time formula specified below.

$$H = H_M \sqrt{\frac{N_R + (T_M - 1)}{T_M}}$$

where:

H is the relevant haircut

H_M is the relevant haircut in respect of the minimum holding period

T_M is the relevant minimum holding period for the type of transaction

N_R is the actual number of business days between remargining for capital market transactions or revaluation in respect of secured transactions

For example, when a bank calculates the volatility on a T_N day holding period which is different from the specified minimum holding period T_M, the bank shall calculate the relevant haircut H_M using the square root of time formula specified below.

$$H_M = H_N \sqrt{\frac{T_M}{T_N}}$$

where:

H_M = the adjusted haircut

T_N = holding period used by the bank for deriving H_N

H_N = haircut based on the holding period T_N

Similarly, when the frequency of remargining or revaluation is longer than the minimum period specified in table 12 above, the relevant percentage in respect of the minimum haircut shall be scaled up depending on the actual number of business days between remargining or revaluation, using the relevant square root of time formula.

For example, based on the relevant specified square root of time formula, a bank that uses the standard haircuts specified in table 11 in subparagraph (xi) above shall use the relevant ten business day haircut percentages specified in the table as a basis in scaling the said haircut percentages up or down depending on the type of transaction and the frequency of remargining or revaluation, as specified below.

$$H = H_{10}\sqrt{\frac{N_R + (T_M - 1)}{10}}$$

where:

H = adjusted haircut

$\mathbf{H_{10}}$ = the ten business day standard haircut in respect of the instrument, specified in table 11 in subparagraph (xi) above

$\mathbf{N_R}$ = the actual number of business days between remargining for capital market transactions or revaluation for secured transactions

$\mathbf{T_M}$ = the minimum holding period for the type of transaction

(C) shall take into account the lack of liquidity of lower quality assets, that is, the bank shall adjust the holding period upwards in cases where the holding period is regarded as inappropriate based on the liquidity of the collateral;

(D) shall identify any situations in which historical data may understate potential volatility, such as in the case of a pegged currency, in which case the bank shall subject the data to stress tests;

(E) shall apply a historical observation period for the calculation of haircuts of no less than one year.

When a bank uses a weighting scheme or other method for the historical observation period, the effective observation period shall be at least one year, that is, the weighted average time lag of the individual observations shall not be less than 6 months.

(F) shall update its data sets at least once every three months;

(G) shall reassess the data whenever market prices are subject to material change.

(xiii) *Comprehensive approach: qualitative criteria relating to own estimates of haircuts*

As a minimum, a bank that wishes to calculate its own haircuts for purposes of calculating the bank's adjusted exposure-

(A) shall use the estimated volatility data, including the holding period, in the day-to-day risk management process of the bank;

(B) shall have in place a robust process in order to ensure compliance with the bank's documented set of internal policies, controls and procedures relating to the operation of the risk measurement system;

(C) shall use its risk measurement system in conjunction with internal exposure limits;

(D) shall on a regular basis conduct an independent review of its risk measurement system as part of the bank's own internal auditing process;

(E) shall at regular intervals, but not less frequently than once a year, conduct a comprehensive review of the bank's overall risk management process, which review, as a minimum, shall address-

(i) the integration of the bank's risk measures into its daily risk management process;

(ii) the validation of any significant change in the bank's risk measurement process;

(iii) the accuracy and completeness of any position data;

(iv) the verification of the consistency, timeliness and reliability of data sources used in the application of the bank's internal models, including the independence of such data sources;

(v) the accuracy and appropriateness of assumptions relating to volatility.

(xiv) *Comprehensive approach: Minimum conditions relating to a haircut of zero per cent in the case of repo-style transactions*

In the case of any repo-style transaction, a bank other than a bank that obtained the approval of the Registrar to apply its VaR model to reflect price volatility as envisaged in subparagraph (xvi) below may apply a haircut of zero per cent provided that-

(A) both the exposure and the collateral shall consist of cash or a sovereign security or public-sector security qualifying for a zero per cent risk weight in terms of the standardised approach;

(B) both the exposure and the collateral shall be denominated in the same currency;

(C) the transaction shall be overnight or both the exposure and the collateral shall be marked to market on a daily basis and shall be subject to daily remargining;

(D) following the failure of the counterparty to remargin, the time that is required from the last mark-to-market adjustment, before the failure to remargin occurred, and the liquidation of the collateral, shall be no more than four business days;

(E) the transaction shall be settled across a settlement system proven for the said type of transaction;

(F) the documentation in respect of the agreement shall be standard market documentation for the said transactions;

(G) the transaction shall be governed by documentation that specifies that when the counterparty fails to satisfy an obligation to deliver cash or securities or to deliver margin, or otherwise defaults, the transaction shall be immediately terminable;

(H) upon any default event, regardless whether the counterparty is insolvent or bankrupt, the bank shall have the unfettered, legally enforceable right to immediately seize and liquidate the collateral for the bank's benefit;

(I) the agreement shall be concluded with-

(i) a sovereign;

(ii) a central bank;

(iii) a public-sector entity;

(iv) a bank or securities firm provided that in the case of a securities firm the firm shall be subject to supervisory and regulatory arrangements comparable to banks in the Republic, including, in particular, risk-based capital requirements and regulation and supervision on a consolidated basis;

(v) other financial institutions, including an insurance company, eligible for a risk weight of 20 per cent in terms of the standardised approach;

(vi) a regulated mutual fund specified in writing by the Registrar provided that the said mutual fund shall be subject to capital or leverage requirements;

(vii) a regulated pension fund specified in writing by the Registrar;

(viii) a clearing institution specified in writing by the Registrar;

(ix) subject to such conditions as may be specified in writing by the Registrar, such other person or institution as may be determined by the Registrar.

(xv) Comprehensive approach: Minimum conditions relating to bilateral master netting agreements

A bank-

(A) that concludes a repo-style agreement or transaction with a counterparty, which agreement or transaction is included in a bilateral master netting agreement, may recognise the effects of the bilateral master netting agreement provided that the said netting agreement-

(i) shall be legally enforceable in each relevant jurisdiction upon the occurrence of an event of default, regardless whether the counterparty is insolvent or bankrupt.

In cases of legal uncertainty, the reporting bank shall obtain a legal opinion to the effect that its right to apply netting of gross claims is legally well founded and would be enforceable in the liquidation, default or bankruptcy of the counterparty or the bank;

(ii) shall provide the non-defaulting party upon an event of default, including in the event of insolvency or bankruptcy of the counterparty, the right to terminate and close-out, in a timely manner, all transactions included in the agreement;

(iii) shall make provision for-

(aa) the netting of gains and losses relating to all transactions included in the agreement, including the value of any collateral, which transactions were terminated and closed out, resulting in a single net amount which shall be owed by the one party to the other;

(bb) the prompt liquidation or set-off of collateral upon an event of default.

(B) may net positions held in its banking book against positions held in its trading book provided that-

(i) all the relevant transactions shall be marked to market on a daily basis; and

(ii) the collateral instruments used in the relevant transactions shall constitute eligible financial collateral in the banking book.

(xvi) *Comprehensive approach: Minimum conditions relating to the use of VaR models*

As an alternative to the use of the standard haircuts specified in table 11 in subparagraph (xi) above, or the calculation of own estimated haircuts, a bank that obtained the prior written approval of the Registrar for the use of risk measurements derived from the bank's internal risk-management model in respect of the bank's trading activities may use a VaR-model approach to reflect the price volatility of the exposure and the collateral in respect of repurchase or resale agreements, taking into account the effects of correlation between security positions, provided that-

(A) subject to the prior written approval of and such conditions as may be specified in writing by the Registrar, the bank may also apply the VaR approach to margin lending transactions and other transactions similar to repo-style transactions or securities financing transactions;

(B) the VaR approach shall be applied-

(i) only to transactions covered by bilateral master netting agreements, that is, the VaR approach shall not be applied in respect of any repurchase agreement, resale agreement or margin lending transaction unless the relevant transaction is covered by a bilateral master netting agreement, which bilateral master netting agreement shall comply with the relevant requirements specified in subparagraph (xv) above, and the relevant requirements specified in subregulations (17) to (19) below;

(ii) on a counterparty-by-counterparty basis;

(C) the bank-

(i) shall at all times comply with the relevant model validation requirements and operational requirements specified in regulations 39(8) and in subregulation (19), and such further requirements as may be specified in writing by the Registrar;

(ii) may in the case of repurchase and resale agreements apply a minimum holding period of five business days unless a five business day holding period is inappropriate based on the liquidity of the instrument.

(c) Guarantees

(i) Minimum requirements

As a minimum, a bank that adopted the standardised approach for risk mitigation relating to guarantees shall comply with-

(A) the relevant minimum requirements specified in subregulation (7)(c) above; and

(B) such further conditions as may be specified in writing by the Registrar.

(ii) Eligible guarantees/guarantors

For risk-mitigation purposes in terms of these Regulations, credit protection obtained from guarantors that are assigned a risk weight lower than the protected exposure shall be recognised as eligible guarantees, including guarantees obtained from-

(A) sovereigns;

(B) central banks;

(C) public-sector entities;

(D) banks;

(E) multilateral development banks;

(F) securities firms;

(G) other entities rated A- or better.

Provided that for purposes of calculating the minimum required amount of capital and reserve funds of a branch in terms of the provisions of the Banks Act, 1990, read with these Regulations, no guarantee received from the parent foreign institution or any other branch of the parent foreign institution in respect of an exposure incurred by the branch in the Republic shall be regarded as an eligible guarantee.

(iii) *Risk weighting*

When a bank that adopted the standardised approach for risk mitigation obtains protection against loss in the form of an eligible guarantee in respect of the bank's exposure or potential exposure to credit risk, the risk weight applicable to the guaranteed transaction or guaranteed exposure may be reduced to the risk weight applicable to the relevant guarantor in accordance with the provisions of this paragraph (c).

The lower risk weight of the guarantor shall apply to the outstanding amount of the exposure protected by the guarantee, provided that the bank shall comply with the said relevant minimum requirements.

The unprotected portion of the exposure shall retain the risk weight relating to the relevant counterparty.

(iv) *Materiality thresholds*

For purposes of these Regulations, a materiality threshold below which no payment will be made in the event of a loss to the reporting bank or that reduces the amount of payment by the guarantor shall be regarded as equivalent to a retained first-loss position and shall be deducted in full from capital of the reporting bank in accordance with the relevant provisions of subregulation (6)(j) above.

(v) *Proportional cover*

When a bank obtains a guarantee for less than the amount of the bank's exposure to credit risk, the bank shall recognise the credit protection on a proportional basis, that is, the protected portion of the exposure shall be risk weighted in accordance with the relevant provisions of this paragraph (c) and the remainder of the credit exposure shall be regarded as unsecured.

(vi) *Currency mismatches*

When a bank obtains credit protection that is denominated in a currency that differs from the currency in which the exposure is denominated, the amount of the exposure deemed to be protected shall be reduced by the application of the formula specified below, which formula is designed to recognise the effect of the currency mismatch. The formula is expressed as:

$$G_A = G \times (1-H_{FX})$$

where:

G is the relevant nominal amount of the credit protection obtained

$\mathbf{H_{FX}}$ is the haircut relating to the currency mismatch between the credit protection and the underlying obligation.

The haircut shall be based on a ten business day holding period and daily mark to market.

When a bank applies the standard haircuts, a haircut equal to 8 per cent shall apply.

A bank shall use the relevant square root of time formula specified in paragraph (b)(xii) above to scale up a haircut percentage when the holding period or frequency of mark-to-market adjustment differs from the specified minimum requirements.

(d) *Credit-derivative instruments*

(i) *Risk weighting: Protection buyer (seller of credit risk)*

(A) For the protected portion of a credit exposure, a bank that is a protection buyer shall substitute the risk weight relating to the eligible protection provider for the risk weight of the reference asset, reference entity or underlying asset.

The lower risk weight relating to the eligible protection provider shall apply to the outstanding amount of the transaction or exposure protected by the credit-derivative instrument, provided that all the relevant conditions specified in this paragraph (d) are met.

The unprotected portion of the exposure shall retain the risk weight relating to the relevant underlying exposure.

(B) When a bank hedges the credit risk relating to an exposure included in the bank's banking book with a credit-derivative instrument included in the bank's trading book, the bank shall only recognise the credit protection to the extent that the bank transferred the relevant credit risk to an eligible third party protection provider.

(C) In the case of-

(i) a first-to-default structure, the protection buyer shall recognise the credit protection in respect of the exposure with the lowest risk-weighted amount provided that the notional amount of the relevant credit exposure shall be lower than or equal to the notional amount of the credit-derivative instrument;

(ii) a second to default structure, the protection buyer shall recognise the protection only when the protection buyer also obtained first-to-default protection, or when one of the assets in the basket already defaulted;

(iii) a proportional structure, the protection buyer may proportionally recognise protection in respect of all relevant reference assets, reference entities or underlying assets.

(D) When a bank buys protection in the absence of an underlying exposure, or when bought protection is not eligible for recognition in the reporting bank's calculation of required capital in respect of an underlying exposure, the relevant credit-derivative instrument shall be ignored for purposes of calculating the reporting bank's capital requirements relating to banking activities.

(E) A materiality threshold contained in a credit-derivative contract that requires a given amount of loss to occur to the protection buyer before the protection seller is obliged to make payment to the protection buyer or reduces the amount of payment to the protection buyer shall be regarded as equivalent to a first-loss credit-enhancement facility applied in asset securitisation and synthetic securitisation structures.

A bank that is a protection buyer shall deduct from its capital and reserve funds such a materiality threshold in accordance with the relevant provisions specified in subregulation (6)(j) above. The deduction from the reporting bank's capital in respect of such bought protection shall be limited to the capital requirement relating to the underlying asset or reference asset when no protection is recognised.

(ii) *Risk weighting: Protection provider/seller (buyer of credit risk)*

(A) A bank that is a protection provider shall treat the position arising from the credit-derivative instrument as though the bank had a direct credit exposure to the reference asset, reference entity or underlying asset.

(B) When a protection provider-

(i) provides protection in the form of a funded credit-derivative instrument, the protection seller, upon conclusion of the credit-derivative contract, is exposed to the sum of the credit risk relating to the reference asset, reference entity or underlying asset and the credit risk relating to the funds placed with the protection buyer.

The protection provider shall risk weight the exposure according to the risk weight applicable to the reference asset or underlying asset, or the risk weight applicable to the protection buyer, whichever risk weight is the highest.

The exposure at risk shall be limited to the maximum payment in terms of the credit-derivative contract.

(ii) entered into an unfunded credit-derivative contract, the protection seller is exposed only to the credit risk relating to the reference asset, reference entity or underlying asset.

(C) In the case of a first-to-default structure, the protection provider shall risk weight·its exposure to credit risk in accordance with the relevant requirements specified below.

(i) In the case of a credit-derivative instrument with a rating assigned by an eligible institution, the protection provider shall multiply the amount of the position with the risk weight specified in table 13 below.

Table 13

External credit assessment[1]	Long term rating[1]				
	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to BB-	B+ and below or unrated
Risk weight	20%	50%	100%	350%	Deduct[2]

External credit assessment[1]	Short term rating[1]			
	A-1/P-1	A-2/P-2	A-3/P-3	All other
Risk weight	20%	50%	100%	Deduct[2]

1. The notations used in this table relate to the ratings applied by a particular credit assessment institution. The use of the rating scale of a particular credit assessment institution does not mean that any preference is given to a particular credit assessment institution and the assessments/ rating scales of other external credit assessment institutions, recognised as eligible institutions in South Africa, may have been used instead.
2. The bank shall deduct from its primary share capital and primary unimpaired reserve funds 50 per cent of the relevant amount and from its secondary capital and secondary unimpaired reserve funds the remaining 50 per cent.

(ii) In the case of unrated exposures, the protection seller shall maintain capital against each of the reference assets, reference entities or underlying assets in the basket by aggregating the risk weights of the assets included in the basket up to a maximum of 1250 per cent, or such imputed percentage as may be applicable from time to time, and multiplying the aggregated risk weight with the notional amount of the protection provided, that is, the aggregate amount of capital held by the protection provider shall not exceed an amount equal to a deduction from capital.

(D) In the case of a second-to-default structure, the protection seller shall risk weight its exposure to credit risk in a manner similar to the method set out in item (C) above, which item (C) relates to a first-to-default structure, provided that in aggregating the risk weights relating to unrated exposures, the protection seller shall exclude from the aggregated risk weight the exposure with the lowest risk weight.

(E) In the case of a proportional structure, the protection seller shall proportionally attribute the relevant risk weights to all relevant reference assets, reference entities or underlying assets.

(iii) *Eligible protection providers*

For risk-mitigation purposes in terms of these Regulations, credit protection obtained from protection providers that are assigned a risk weight lower than the protected exposure shall be recognised as eligible protection providers, including protection obtained from:

(A) sovereigns;

(B) central banks;

(C) public-sector entities;

(D) banks;

(E) securities firms;

(F) other entities rated A- or better.

(iv) *Funded credit-derivative instruments*

A bank may issue cash instruments, such as credit-linked notes, in respect of which instruments the repayment of the principal amount is linked to the credit standing of a reference asset, reference entity or underlying asset.

For risk-mitigation purposes, a bank shall treat credit-linked notes in a manner similar to cash-collateralised transactions.

(v) *Unfunded credit-derivative instruments*

(A) The capital treatment of the different credit risk-mitigation instruments recognized in terms of these Regulations shall be based on the economic effects of the instruments and not the legal construction of the said instruments.

Although the legal construction of guarantees may differ from credit-derivative instruments, only credit-default swaps and total-return swaps that provide credit protection equivalent to guarantees shall be recognised as credit risk-mitigation instruments, in addition to credit-linked notes, in terms of these Regulations.

(B) When a bank buys credit protection through a total-return swap and records the net payments received on the swap as net income, but does not record the offsetting deterioration in the value of the asset that is protected, either through a reduction in fair value or an adjustment to reserves, the credit protection shall not be recognised.

(vi) *Materiality thresholds*

(A) Normally, a materiality threshold is specified in a credit-derivative contract in order to ensure that the protection seller is obliged only to make payment in terms of the credit-derivative contract once a material default has occurred in respect of an underlying asset, reference asset or reference entity.

However, the economic effect of a materiality threshold specified in a credit-derivative contract may be that the protection buyer will suffer a specified amount of loss before payment in terms of the credit-derivative contract is triggered or the amount of payment by the protection seller to the protection buyer may even be reduced.

Materiality thresholds specified in a credit-derivative contract may therefore result in a significant loss being incurred by the protection buyer on an underlying asset or reference asset without a credit-event payment being made.

(B) Materiality thresholds below which no payment will be made in the event of a loss to the protection buyer or that reduce the amount of payment by the protection seller to the protection buyer shall for purposes of these Regulations be regarded as equivalent to a retained first-loss position and shall be deducted in full from capital in accordance with the relevant provisions specified in subregulation (6)(j) above.

(C) A credit-derivative instrument with a materiality threshold that requires a high percentage of loss to occur before the protection seller is obliged to make payment to the protection buyer shall not be recognised for credit-risk mitigation purposes in terms of these Regulations.

(vii) Multiple-name instruments

(A) Multiple-name instruments refer to credit-derivative instruments that reference more than one reference asset, reference entity or underlying asset, that is, a basket of instruments. Multiple-name structures generally include-

(i) first-to-default structures, that is, the first default amongst the reference names triggers the credit protection and the credit event also terminates the protection;

(ii) second-to-default structures, that is, the second default amongst the reference names triggers the credit protection and the credit event also terminates the protection.

(B) When the number of exposures in a basket is significant, the transaction will be regarded as a synthetic securitisation scheme. Such transactions shall be subject to the provisions of the exemption notice relating to securitisation schemes.

(C) For the purposes of these Regulations, the number of exposures in a basket shall be regarded as significant when the envisaged transaction will cause-

(i) the capital requirement of the reporting bank to increase or decrease by 5 per cent or more; or

(ii) the amount of the relevant portfolio of the reporting bank in respect of which the transaction will be concluded to increase or decrease by 5 per cent or more.

(viii) Settlement

(A) Normally, credit-derivative instruments provide for either physical settlement or cash settlement.

(B) Some credit-derivative instruments provide for pre-agreed amounts to be paid when a credit event occurs. These contracts are generally referred to as binary or digital contracts.

When the payment in terms of a credit-derivative instrument is a fixed amount, that is, a binary payment, the amount of protection shall be the amount of the fixed payment.

(C) Physical settlement, for example, involves the delivery by a protection buyer of an obligation of the reference entity specified in the contract in return for cash settlement by the protection seller of the reference amount.

When obligations in terms of credit-derivative instruments are physically settled, problems associated with the valuation of the reference asset, reference entity or underlying asset following a credit event are avoided.

(D) Cash settlement requires a cash settlement amount to be calculated by a calculating agent specified in the contract. Following the occurrence of a credit event in respect of the reference asset, reference entity or underlying asset, the cash settlement amount is normally calculated as-

- the nominal amount of protection purchased; **multiplied by**
- the value of the reference asset, reference entity or underlying asset at inception (the value is normally expressed as a percentage, for example, 100 per cent); **less**
- the "final value", which value is normally expressed as a percentage of the reference asset, reference entity or underlying asset on the cash-settlement date.

(ix) Foreign-currency positions

A bank shall include in the forms BA 320 and BA 325 all relevant foreign-currency positions created by credit-derivative instruments when the bank calculates its aggregate effective net open foreign-currency position.

(x) Proportional cover

When a bank obtains credit protection for less than the amount of the bank's exposure to credit risk, the bank shall recognise the credit protection on a proportional basis, that is, the protected portion of the exposure shall be risk weighted in accordance with the provisions of this paragraph (d) and the remainder of the credit exposure shall be regarded as unsecured.

(xi) Minimum requirements relating to credit-derivative instruments

(A) General requirement

(i) Notwithstanding the provisions of these Regulations, a bank that wishes to engage in credit-derivative transactions-

(aa) shall obtain the prior written approval of the Financial Surveillance Department of the Reserve Bank in respect of any such transaction involving a non-resident person;

Should the Financial Surveillance Department of the Reserve Bank grant its approval to the said transaction, the bank shall adhere to such rules, conditions or such regulations as may be specified by the Financial Surveillance Department of the Reserve Bank relating to such credit-derivative instruments;

(bb) shall comply with such rules, conditions or such regulations as may be specified by the Financial Surveillance Department of the Reserve Bank relating to credit-derivative instruments.

(ii) Protection from a credit-derivative contract shall be recognised in terms of these Regulations to the extent-

(aa) that such protection was not already taken into consideration in the calculation of the reporting bank's required amount of capital and reserve funds;

(bb) that such protection can be realised by the reporting bank under normal market conditions, that is, the value at which the protection can be realised shall not differ materially from its book value.

(B) Specific requirements

A bank that wishes to recognise the risk-mitigation effect of protection obtained in the form of a credit-derivative instrument in the calculation of the bank's credit exposure shall comply with the requirements specified below.

(i) Direct

The credit protection shall constitute a **direct claim** on the protection seller.

(ii) Explicit

The credit protection shall be linked to specific credit exposures, so that the extent of the cover is duly defined and incontrovertible.

(iii) Irrevocable

Other than a protection buyer's non-payment of money due in respect of the credit protection contract, there shall be no clause in the contract that would allow the protection seller unilaterally to cancel the credit protection or increase the effective cost of the protection as a result of deterioration in the credit quality of the protected exposure.

(iv) Unconditional

There shall be no clause in the contract other than clauses relating to procedural requirements that could prevent the protection seller from being obliged to make payment in a timely manner should a credit event occur in respect of an underlying asset, reference entity or reference asset.

(v) The credit protection shall be legally enforceable in all relevant jurisdictions

In cases of uncertainty, a bank shall obtain legal opinion confirming the enforceability of the credit protection in all relevant jurisdictions and that the bank's rights are legally well founded. Legal opinions shall be updated at appropriate intervals in order to ensure continuing enforceability.

(vi) The protection seller shall not have any formal recourse to the protection buyer in respect of losses incurred by the protection seller.

(vii) In the case of a funded single-name credit-derivative contract, the protection buyer shall not be obliged to repay any funds received from the protection seller in terms of the credit-derivative contract, except at the maturity date of the contract, provided that no credit event has occurred during the period of bought protection or as a result of a defined credit event, and then in accordance with the terms of payment defined in the contract.

(viii) In order to obtain full recognition of the protection obtained, the base currency of a credit-derivative instrument shall be the same currency as the currency in which the credit exposure that is protected is denominated.

When a credit-derivative instrument is denominated in a currency that differs from the currency in which the credit exposure is denominated, that is, when there is a currency mismatch, the bought protection may be less than expected owing to fluctuations in the exchange rates.

When a bank obtains credit protection that is denominated in a currency that differs from the currency in which the exposure is denominated, the amount of the exposure deemed to be protected shall be reduced by the application of the formula specified below, which formula is designed to recognise the effect of the currency mismatch. The formula is expressed as:

$G_A = G \times (1 - H_{FX})$

where:

G_A is the relevant adjusted value of the protection

G is the relevant nominal amount of the credit protection obtained

H_{FX} is the haircut relating to the currency mismatch between the credit protection and the underlying obligation.

The haircut shall be based on a ten business day holding period and daily mark to market.

When a bank applies the standard haircuts, a haircut equal to 8 per cent shall apply.

A bank shall use the relevant square root of time formula specified in paragraph (b)(xii) above to scale up a haircut percentage when the holding period or frequency of mark-to-market adjustment differs from the specified minimum requirements.

(ix) *Robust risk-management process*

While credit-derivative instruments reduce credit risk, they simultaneously increase other risks to which a bank is exposed, such as legal and operational risks.

Therefore, a bank shall employ robust procedures and processes to control the aforesaid risks.

As a minimum, a robust risk-management process relating to credit-derivative instruments shall include the fundamental elements specified below.

(aa) Strategy

A duly articulated strategy for credit-derivative instruments shall form an intrinsic part of a bank's general credit strategy and overall liquidity strategy.

(bb) Focus on underlying credit

A bank shall continue to assess an exposure that is hedged by a credit-derivative instrument on the basis of the borrower's creditworthiness. A bank shall obtain and analyse sufficient financial information to determine the obligor's risk profile and its risk management and operational capabilities.

(cc) Systems

A bank's policies and procedures shall be supported by management systems capable of tracking the location and status of its credit-derivative instruments.

(dd) Concentration risk

A bank shall have in place a duly defined policy with respect to the amount of concentration risk that it is prepared to accept.

A bank shall take into account purchased credit protection when assessing the potential concentrations in its credit portfolio, including when the bank determines its concentration risk in terms of section 73 of the Act.

A bank shall monitor general trends affecting its credit-protection sellers, in order to mitigate its concentration risk.

(ee) *Roll-off risks*

When a bank obtains credit protection that differs in maturity from the underlying credit exposure, the bank shall monitor and control its roll-off risks, that is, the fact that the bank will be exposed to the full amount of the credit exposure when the credit protection expires.

(x) As a minimum, the risk management systems of the reporting bank shall be adequate-

(aa) to capture the credit risk relating to a reference asset, reference entity or underlying asset acquired through a credit-derivative contract and any counterparty risk arising from an unfunded over-the-counter credit-derivative contract within the normal credit approval and credit monitoring processes;

(bb) to assess the probability of default correlation between the reference asset, reference entity or underlying asset and the protection provider;

(cc) to provide valuation procedures, including assessment and monitoring of the liquidity of the credit-derivative instrument and the reference asset or underlying asset. This is particularly important for credit-derivative contracts when the reference asset or underlying asset is illiquid, for example, a loan, or when the derivative instrument has multiple reference assets, reference entities or underlying assets;

(dd) to assess the impact on liquidity risk when the reporting bank has transferred a significant amount of credit risk through the use of funded credit-derivative instruments with a shorter maturity than the underlying credit exposure;

(ee) to assess the impact on capital adequacy when the reporting bank has transferred a significant amount of credit risk through the use of unfunded credit-derivative instruments and when a replacement contract may not be available when the credit protection expires;

(ff) to assess the change in the risk profile of the remaining credit exposures in terms of both the quality and the spread of the portfolio, when the reporting bank makes extensive use of credit-derivative instruments to transfer risk;

(gg) to assess the basis risk between the reference asset exposure and the underlying asset exposure when these exposures are not the same;

(hh) to monitor the legal and reputational risk associated with credit-derivative instruments;

(ii) to monitor the credit risk on an ongoing basis.

(xi) As a minimum, the credit events relating to non-sovereign debt, specified by the contracting parties shall include:

(aa) Bankruptcy or insolvency.

(bb) Any application for protection from creditors.

(cc) Payment default, that is, failure to pay the principal amount or related interest amounts due.

(dd) Any restructuring of the underlying obligation that results in a credit loss event such as a credit impairment or other similar debit being raised, including-

(i) a reduction in the rate or amount of interest payable or the amount of scheduled interest accruals;

(ii) a reduction in the amount of principal, fees or premium payable at maturity or at the scheduled redemption dates;

(iii) a change in the ranking in the priority of payment of any obligation, causing the subordination of such obligation;

(iv) a postponement or other deferral of a date or dates for either the payment or accrual of interest or the payment of the principal amount or premium.

When the credit-derivative instrument does not include the restructuring of the underlying obligation as a credit event, it shall be deemed that the bank obtained protection equal to a maximum of sixty per cent of the amount covered in terms of the credit-derivative instrument.

(xii) As a minimum, the credit events relating to sovereign debt, specified by the contracting parties shall include:

(aa) Any moratorium on the repayment of the principal amount or related interest amounts due.

(bb) Repudiation.

(cc) Payment default, that is, failure to pay the principal or related interest amounts due.

(dd) Any restructuring of the underlying obligation that results in a credit loss event such as a credit impairment or other similar debit being raised, including-

(i) a reduction in the rate or amount of interest payable or the amount of scheduled interest accruals;

(ii) a reduction in the amount of principal, fees or premium payable at maturity or at the scheduled redemption dates;

(iii) a postponement or other deferral of a date or dates for either the payment or accrual of interest or the payment of the principal amount or premium;

When the credit-derivative instrument does not include the restructuring of the underlying obligation as a credit event, it shall be deemed that the bank obtained protection equal to a maximum of sixty per cent of the amount covered in terms of the credit-derivative instrument.

(xiii) Contracts allowing for cash settlement will be recognised for risk-mitigation purposes, provided that a robust valuation process is in place in order to estimate loss reliably. There shall be a duly specified period for obtaining post credit-event valuations of the reference asset or underlying obligation, typically not more than 30 days.

(xiv) The grace period specified in the credit-derivative contract shall not be longer than the relevant grace period provided for failure to pay in terms of the underlying obligation.

(xv) The protection buyer shall have the right and ability to transfer the underlying obligation or reference asset to the protection seller, if such underlying obligation or reference asset is required for settlement.

(xvi) The delivery of the underlying obligation or reference asset shall not contravene any term or condition relating to the underlying asset or reference asset, and consent shall be obtained when necessary.

(xvii) The identity of the person(s) responsible for determining whether a credit event has occurred, and the sources to be used, shall be duly defined. This determination shall not be the sole responsibility of the protection seller. The protection buyer shall have the right and ability to inform the protection seller of the occurrence of a credit event.

(xviii) *Asset mismatch*

When the reference asset and the underlying asset being hedged differ the protection buyer may suffer a loss on the underlying credit exposure that will not be fully compensated by an equivalent claim against the protection seller.

When there is an asset mismatch between the underlying exposure and the reference asset the protection buyer will be allowed to reduce the credit exposure provided that-

(aa) the reference asset and the underlying exposure relate to the same obligor, that is, the same legal entity;

(bb) the reference asset ranks *pari passu* with or more junior than the underlying asset in the event of bankruptcy;

(cc) legally effective cross default clauses, for example, cross default or cross acceleration clauses apply; and

(dd) the terms and conditions of the credit-derivative contract do not contravene the terms and conditions of the underlying asset or reference asset.

(e) *Maturity mismatches*

(i) A maturity mismatch occurs when the residual maturity of the credit protection obtained in the form of eligible collateral, guarantees or credit-derivative instruments, or in terms of a netting agreement, is less than the residual maturity of the underlying credit exposure, that is, when the residual maturity of the credit protection is-

(A) less than the residual maturity of the underlying credit exposure a maturity mismatch exists and the bank shall treat the relevant positions in accordance with the relevant requirements of this paragraph (e);

(B) longer than the residual maturity of the underlying credit exposure, the position shall be regarded as fully protected.

(ii) A bank shall conservatively define the maturity of the underlying exposure and the maturity of the credit protection.

The effective maturity of the underlying exposure shall be the longest possible remaining time before the obligor is scheduled to fulfil its obligation.

Embedded options that may reduce the term of the credit protection shall be taken into account when the effective maturity of the credit protection is determined so that the shortest possible effective maturity is used. For example, the effective maturity of credit protection with step-up and call features will be the remaining time to the first call.

(iii) In the case of maturity mismatched credit protection in respect of which the original maturity of the relevant credit protection is less than one year such credit protection shall not be recognised for credit-risk mitigation purposes in terms of these Regulations unless the said credit protection has a matching maturity with the underlying credit exposure(s), that is, credit protection with an original maturity of less than one year shall be recognised only when-

(A) the maturity of the protection and the maturity of the exposure is matched; or

(B) the residual maturity of the protection is longer than the residual maturity of the exposure, provided that in the calculation of its minimum required amount of capital and reserve funds a bank shall in no case recognise credit protection obtained when the residual maturity of such credit protection is less than or equal to three months.

(iv) When a bank obtained eligible protection, which bank adopted-

(A) the simple approach for the recognition of risk mitigation relating to collateral, a reduction in the risk exposure of the bank shall be allowed only when the maturity of the collateral and the maturity of the exposure is matched, that is, collateral obtained by the bank as security against an exposure of the bank shall be pledged as security for the full duration of the bank's exposure;

(B) the comprehensive approach for the recognition of risk mitigation relating to netting, collateral, guarantees or credit-derivative instruments, shall recognise the effect of mismatches between the maturity of the bank's underlying exposure and the protection obtained through the application of the formula specified below, which formula is designed to recognise the effect of the maturity mismatch. The formula is expressed as:

$$Pa = P \times (t-0.25)/(T-0.25)$$

where:

Pa is the relevant value of the credit protection obtained, adjusted for the maturity mismatch

P is the relevant amount of credit protection obtained, adjusted for any haircuts

t is min (T, residual maturity of the credit protection arrangement), expressed in years

T is min (5, residual maturity of the exposure), expressed in years

(v) When a bank obtains protection that differs in maturity from the underlying credit exposure the bank shall monitor and control its roll-off risks, that is, the fact that the bank will be exposed to the full amount of the credit exposure when the protection expires.

The bank may be unable to obtain further protection or to maintain its capital adequacy when the protection expires.

(f) *Treatment of pools of risk mitigation instruments*

(i) When a bank obtains-

(A) multiple risk mitigation instruments in order to protect a single exposure, that is, the bank has obtained, for example, collateral, guarantees and credit-derivative instruments partially protecting an exposure; or

(B) protection with differing maturities,

the bank shall subdivide the exposure into portions covered by the relevant types of risk mitigation instruments.

(ii) A bank shall separately calculate its risk-weighted exposure relating to each relevant portion envisaged in subparagraph (i) above.

(g) *Risk mitigation in respect of a securitisation exposure*

When a bank that adopted the standardised approach for the measurement of the bank's exposure to credit risk obtains protection in respect of a securitisation exposure the bank shall calculate its risk weighted exposure in respect of the said exposure in accordance with the relevant requirements specified in subregulation (7)(e) read with the relevant requirements specified in this subregulation (9).

(h) *Tranched cover*

When a bank transfers to a protection seller or sellers a portion of the risk arising from an exposure in one or more tranches whilst the said bank retains some level of risk, and the risk transferred and the risk retained are of different seniority, the bank may obtain credit protection, for example, in respect of the more senior tranches, such as the second loss position, provided that in all cases the bank shall apply the relevant rules and requirements relating to securitisation exposures specified in the exemption notice relating to securitisation schemes read with the relevant requirements specified in subregulations (6)(h), (6)(j), (7)(e) and (8)(h) above.

(10) Calculation of credit risk exposure: IRB approach

Subject to the relevant provisions of regulation 38(2) and subregulation (20), a bank that wishes to adopt the IRB approach for the measurement of the bank's exposure to credit risk-

(a) shall obtain the prior written approval of the Registar;

Should the Registrar grant his/her approval, the bank shall in addition to the minimum requirements relating to the IRB approach specified in subregulation (11)(b) below, continuously comply with such conditions as may be specified in writing by the Registrar;

(b) shall calculate its exposure to credit risk, at the discretion of the bank, either in accordance with the provisions of Method 1, as set out in subregulations (11) and (12) below, or Method 2, as set out in subregulations (13) and (14) below, or, subject to such conditions as may be specified in writing by the Registrar, a combination of the said methods.

(11) Method 1: Calculation of credit risk exposure in terms of the foundation IRB approach

(a) Unless specifically otherwise provided, a bank that obtained the prior written approval of the Registrar to adopt the foundation IRB approach to calculate the bank's exposure to credit risk in respect of positions held in the bank's banking book-

(i) shall continuously comply with the relevant minimum requirements specified in paragraph (b) below and such further conditions as may be specified in writing by the Registrar in respect of any asset class subject to the IRB approach;

(ii) shall continuously comply with the relevant minimum disclosure requirements specified in regulation 43(2);

(iii) shall categorise its exposures in accordance with the relevant requirements specified in paragraph (c) below;

(iv) shall calculate its risk-weighted exposures in accordance with the relevant requirements and risk components specified in paragraph (d) below;

(v) shall apply the IRB approach for the measurement of the bank's securitisation or resecuritisation exposure, that is, a bank shall not use the IRB approach for the measurement of the bank's securitisation or resecuritisation exposure unless the bank obtained the prior written approval of the Registrar to apply the IRB approach for the measurement of the bank's exposure to underlying credit exposure, provided that the bank shall in respect of the said securitisation or resecuritisation exposures comply with the relevant requirements specified in paragraph (b)(xii) below.

(vi) shall calculate any relevant credit impairment, amongst other things, in accordance with the relevant requirements specified in subregulation (22);

(vii) shall deduct from the bank's capital and reserve funds such amounts as may be specified in paragraph (q) below.

(b) Minimum requirements

(i) Subject to such conditions as may be specified in writing by the Registrar, a bank that adopted the foundation IRB approach for the measurement of the bank's exposure to credit risk in respect of positions held in the bank's banking book shall apply the said approach in respect of all the bank's material asset classes and business units.

(ii) For a minimum period of three years or such lesser minimum period as may be specified in writing by the Registrar, prior to a bank's implementation of the foundation IRB approach for the measurement of the bank's exposure to credit risk, the rating and risk estimation systems and processes of the bank should have-

(A) provided a meaningful assessment of borrower and transaction characteristics;

(B) provided a meaningful differentiation of risk;

(C) provided materially accurate and consistent quantitative estimates of risk;

(D) produced internal ratings and default and loss estimates that formed an integral part of the bank's-

(i) credit approval process;

(ii) risk management process;

(iii) internal capital allocation process;

(iv) corporate governance process;

(E) been subjected to appropriate internal controls and independent review;

(F) been broadly in compliance with the minimum requirements specified in this subregulation (11).

(iii) As a minimum, a bank that adopted the IRB approach for the measurement of the bank's exposure to credit risk in respect of positions held in the bank's banking book shall have in place a duly documented credit policy, which credit policy-

(A) shall be applied consistently over time for internal risk management purposes and in terms of the IRB approach;

(B) shall in the case of exposures relating to corporate institutions, sovereigns or banks duly specify the relationship between borrower grades in terms of the level of risk that each grade implies, that is, the perceived and measured risk shall increase as the credit quality of an exposure declines from one grade to the next;

(C) shall in the case of exposures relating to corporate institutions, sovereigns or banks duly specify the risk represented in each risk grade in terms of both a description of the probability of default risk typical for obligors assigned to the specific grade and the criteria used to distinguish that level of credit risk;

(D) shall duly specify the treatment of individual entities in a connected group, including the circumstances under which the same rating may or may not be assigned to all or some related entities;

(E) shall reinforce and foster the independence of the rating process;

(F) shall duly specify the bank's process relating to the assignment of ratings to credit exposures;

(G) shall duly specify the situations in which the senior management of the bank may override the output of the rating process, including how and to what extent such overrides may be used, and the names of senior management who may approve overrides of the model's output;

(H) shall contain comprehensive requirements to assess the creditworthiness of persons with overdraft facilities;

(I) shall comprehensively deal with-

(i) overdue amounts, including the manner in which the bank determines the number of past due days in respect of credit exposures;

(ii) exposures that are in default;

(iii) re-ageing of facilities or exposures, which re-aging, amongst other things, shall comprehensively deal with-

(aa) persons responsible for approval;

(bb) reporting requirements;

(cc) the minimum age of a facility or exposure before it is eligible for re-ageing;

(dd) the delinquency levels of facilities or exposures that are eligible for re-ageing;

(ee) the maximum number of exposures per facility, eligible for re-ageing;

(ff) a reassessment of the borrower's capacity to repay amounts due;

(iv) the granting of extensions, deferrals, renewals or rewrites in respect of existing accounts.

(iv) A bank that uses multiple systems to support its assessment of credit risk-

(A) shall duly document-

(i) the rationale for assigning a particular obligor to a particular rating system;

(ii) the specific industries or market segments to which a particular rating system applies;

(B) shall allocate the bank's obligors to a rating system in a manner that best reflects the level of risk of a particular obligor.

(v) Without derogating from the provisions of subparagraphs (i) to (iv) above, the rating and risk estimation systems and processes of a bank that adopted the IRB approach for the measurement of the bank's exposure to credit risk in respect of positions held in the bank's banking book-

(A) shall in the case of exposures to corporate institutions, sovereigns or banks, excluding any exposures relating to specialised lending that were mapped into the standardised rating categories specified in paragraph (d)(iii)(C) below, have separate and distinct dimensions relating to-

(i) the risk of borrower default, that is, separate exposures to the same obligor shall be assigned to the same borrower grade, irrespective of any differences in the nature of each specific transaction unless-

(aa) the one exposure is denominated in local currency whilst the other exposure is denominated in foreign currency; or

(bb) protection was obtained in the form of a guarantee, which protection resulted in an adjusted borrower grade,

in which case separate exposures may result in multiple grades in respect of the same obligor.

(ii) transaction-specific factors such as collateral, seniority and product type provided that-

(aa) when the rating system of a bank that adopted the foundation IRB approach contains a facility dimension, which facility dimension reflects both borrower and transaction-specific factors, that is, the rating dimension reflects expected loss by incorporating both borrower strength (PD) and loss severity (LGD) considerations, the rating system shall be deemed to comply with the requirements of this item (A);

(bb) a separate rating system that exclusively reflects LGD ratios shall be deemed to comply with the relevant requirements of this item (A);

(cc) when the rating dimension reflects expected loss but it does not separately quantify the LGD ratio in respect of the said exposure, the bank shall apply the LGD estimates determined by the Registrar.

(B) shall in the case of exposures to corporate institutions, sovereigns or banks ensure a meaningful distribution of exposures across risk grades, that is, the bank shall not have excessive concentrations of exposure in any one of the bank's borrower rating or facility rating scales.

As a minimum, a bank that adopted the IRB approach-

(i) shall in the case of exposures other than specialised lending that were mapped into the standardised rating categories specified in paragraph (d)(iii)(C) below, have no less than seven borrower grades in respect of borrowers that are not in default and one grade for borrowers that have defaulted, provided that-

(aa) the bank shall in the case of concentrations within a single grade have empirical evidence that-

(i) the grades cover sufficiently narrow PD bands;

(ii) the default risk posed by borrowers in a particular grade falls within the specific band;

(bb) the Registrar may require a bank with a diverse portfolio of credit exposure to have more borrower grades than the minimum number of borrower grades specified in this sub-item (i);

(ii) shall in the case of exposures relating to specialised lending, which exposures were mapped into the standardised rating categories specified in paragraph (d)(iii)(C) below, have no less than four borrower grades in respect of borrowers that are not in default and one grade for borrowers that have defaulted;

(iii) shall assign a rating to each obligor and all eligible guarantors, which rating shall be reviewed or approved by a person who does not directly benefit from the extension of credit;

(iv) shall associate each exposure with a facility rating as part of the loan approval process;

(v) shall review assigned borrower and facility ratings on a regular basis, but not less frequently than once a year, provided that the bank shall review all relevant ratings as soon as material new information comes to the attention of the bank;

(vi) shall have in place an effective process in order to obtain and update all relevant information;

(C) may in the case of exposures relating to specialised lending, which exposures were mapped into the standardised rating categories specified in paragraph (d)(iii)(C) below, have a single rating dimension, which rating dimension reflects expected loss by incorporating both borrower strength, that is, PD, and loss severity, that is, LGD;

(D) shall in the case of retail exposures-

(i) be oriented towards and comprehensively capture-

(aa) borrower risk, which borrower risk shall include matters such as borrower type and demographics such as age or occupation; and

(bb) transaction risk, which transaction risk shall include matters relating to product and collateral types such as loan-to-value or lending-to-value measures, guarantees and seniority;

(cc) the delinquency status of all relevant exposures, that is, the bank shall separately identify exposures that are delinquent and exposures that are not delinquent;

(ii) be sufficiently robust to ensure that the bank assigns each retail exposure to a relevant pool of retail exposures as part of the bank's loan approval process, which loan approval process shall make provision for-

(aa) a meaningful differentiation of risk, that is, there shall be a meaningful distribution of borrowers and exposures across the relevant retail pools of exposure in order to ensure that no single pool of exposures results in undue concentration in relation to the bank's total retail exposure;

(bb) a grouping of sufficiently homogenous exposures provided that the bank shall consider the risk drivers in respect of borrower risk, transaction risk and the delinquency status of retail exposures when the bank assigns a particular exposure to a particular retail pool of exposures;

(cc) accurate and consistent estimates of loss characteristics at a pool level, that is, for each pool of retail exposures, the bank shall estimate the risk components of PD, LGD and EAD provided that the number of exposures in a particular exposure pool shall be sufficient to allow for a meaningful quantification and validation of the loss characteristics at the pool level;

(dd) regular review, but not less frequently than once a year, of the status of individual borrowers within each pool and the loss characteristics and delinquency status of each relevant pool provided that the bank-

(i) shall review all relevant risk characteristics as soon as material new information comes to the attention of the bank;

(ii) may make use of a representative sample to review the status of individual borrowers within each pool;

(E) shall make provision for specific rating definitions and criteria in order to assign exposures to relevant risk grades, which definitions and criteria-

(i) shall be plausible and intuitive in order to ensure a meaningful differentiation of risk;

(ii) shall be sufficiently detailed to allow-

(aa) persons responsible for assigning of ratings to consistently assign borrowers or facilities that pose similar risk to the same grade;

(bb) third parties such as the internal audit department or an equally independent function, and the Registrar, to understand the assignment of ratings and to evaluate the appropriateness of the grade or pool assignments;

(iii) shall be duly documented;

(iv) shall be consistent with the bank's internal lending standards;

(v) shall take into consideration all relevant and material information;

(vi) shall periodically be reviewed in order to ensure that the definitions and criteria remain relevant and current.

(F) shall incorporate an appropriate time horizon in order to assign a risk rating to a borrower, which rating shall be based on a sufficiently long time horizon-

(i) to estimate an obligor's probability of default;

(ii) to represent the borrower's ability and willingness to repay contractual obligations despite adverse economic conditions or the occurrence of unexpected events;

(G) may include statistical models and mechanical methods to assign borrower and facility ratings or estimate PD ratios, LGD ratios and EAD amounts, which models and methods-

(i) shall take into account all relevant and material information;

(ii) shall be used appropriately;

(iii) shall have good predictive power;

(iv) shall incorporate a reasonable set of risk predictors and the bank shall have in place clear guidelines and processes to monitor situations in which variables or risk inputs were altered;

(v) shall materially be accurate across a range of borrowers or facilities;

(vi) shall not contain any known material biases;

(vii) shall be subject to a regular validation process of data inputs, including an assessment of accuracy, completeness and appropriateness;

(viii) shall be subject to written policies and procedures for human review and judgement provided that when human judgement is used to override the model's output, the bank shall separately keep track of the performance of the relevant exposure;

(ix) shall be subject to regular backtesting.

(H) shall be duly documented, which documentation, as a minimum-

(i) shall address matters such as-

(aa) specific definitions of default and loss, which definitions shall materially be consistent with the definitions contained in this subregulation (11) and in regulation 67;

(bb) portfolio differentiation;

(cc) rating criteria and the rationale for the bank's choice of particular internal rating criteria provided that the bank shall be able to demonstrate to the satisfaction of the Registrar that the selected rating criteria and procedures are likely to result in ratings that meaningfully differentiate risk;

(dd) the responsibilities of persons responsible for the rating of borrowers and facilities;

(ee) definitions relating to rating exceptions and the persons authorised to approve any rating exceptions;

(ff) the frequency of rating reviews;

(gg) management oversight and the bank's internal control structure;

(hh) the history of major changes in the bank's risk rating process;

(ii) shall provide adequate evidence of the bank's compliance with all relevant minimum requirements;

(iii) shall duly indicate any differences between the bank's risk estimates for purposes of complying with the IRB approach and for internal risk management purposes, such as pricing;

(iv) shall in the case of statistical models used in the bank's rating process, comprehensively deal with-

(aa) the relevant methodologies, including a detailed outline of the theory, assumptions and/ or mathematical and empirical basis to assign risk estimate to risk grades, individual obligors, exposures or pools;

(bb) the data sources used;

(cc) the process to validate the model;

(dd) any circumstances under which the model does not work effectively.

(I) shall be subject to appropriate independent review.

(vi) Risk quantification

(A) Unless specifically otherwise provided, a bank shall in the case of exposures to corporate institutions, sovereigns or banks, estimate a PD ratio in respect of each internal borrower grade, which PD estimate-

(i) may be based on one or more of the three techniques specified below provided that the underlying historical observation period shall be a minimum period of five years in respect of at least one of the said techniques.

(aa) Internal default experience

A bank-

(i) shall demonstrate that the PD estimates are based on the bank's underwriting standards and sufficiently reflect any differences between the rating system that generated the data and the bank's current rating system.

(ii) may use pooled data provided that the bank shall demonstrate to the satisfaction of the Registrar that the internal rating systems and criteria of the other banks in the pool are comparable with the bank's own internal rating systems and criteria.

(bb) Mapping to external data, that is, the bank may map its internal risk grades to a risk scale used by an eligible external credit assessment institution and then attribute the default rate observed in respect of the external credit assessment institution's grades to the bank's grades, provided that-

(i) the bank shall compare and avoid any biases or inconsistencies between the bank's internal rating criteria and the criteria used by the external institution;

(ii) the bank shall compare and avoid any biases or inconsistencies between the internal and external ratings of any common borrowers;

(iii) the external institution's criteria underlying quantification shall be oriented to the risk of borrower default and shall not reflect transaction characteristics;

(iv) the bank shall compare and avoid any biases or inconsistencies between the definitions used in respect of default;

(v) the bank shall document the basis on which the mapping was done.

(cc) Statistical default models, that is, the bank may use a simple average of default-probability estimates in respect of individual borrowers assigned to a particular grade, which estimates were generated by statistical default prediction models, provided that the statistical model shall comply with the relevant minimum requirements specified in subparagraph (v)(G) above;

(ii) shall be based on the definition of default, specified in regulation 67;

(iii) shall be based on a population of exposures that closely matches or is at least comparable to the bank's existing exposures and lending standards;

(iv) shall be based on economic and market conditions that are relevant and current;

(v) shall be a long-run average of the one-year default rates relating to the borrowers in a particular grade;

(vi) shall incorporate all relevant and material information;

(vii) shall take into account any changes in lending practice or the process for pursuing recoveries over the observation period;

(viii) shall be reviewed on a regular basis but not less frequently than once a year or when material new information is obtained;

(ix) shall be based on historical experience and empirical evidence;

(x) shall be based on a sufficient number of exposures and data periods that will ensure accurate and robust PD estimates;

(xi) shall be based on an estimation technique that performs well in out-of-sample tests;

(B) Unless specifically otherwise provided, a bank shall in the case of retail exposures estimate a PD ratio and a LGD ratio in respect of each retail pool of exposures, which PD estimate and LGD estimate-

(i) shall be based on the bank's internal data as the primary source of information;

(ii) shall be based on a number of exposures in a particular exposure pool that is sufficient to allow for a meaningful quantification and validation of the loss characteristics;

(iii) shall be based on the definition of default, specified in regulation 67;

(iv) may rely on external data or statistical models for quantification provided that the bank shall demonstrate to the satisfaction of the Registrar a strong link between-

(aa) the bank's process of assigning exposures to a particular pool and the process used by the external data source;

(bb) the bank's internal risk profile and the composition of the external data;

(v) shall incorporate all relevant and material information;

(vi) shall be based on a population of exposures that closely matches or is at least comparable to the bank's existing exposures and lending standards;

(vii) shall be based on economic and market conditions that are relevant and current;

(viii) shall be based on an estimation technique that performs well in out-of-sample tests;

(ix) shall be reviewed on a regular basis but not less frequently than once a year or when material new information is obtained;

(x) shall be based on long-run average estimates of PD and default-weighted average loss rates given default, based on an estimate of the expected long-run loss rate, provided that-

(aa) the bank may use an appropriate PD estimate to infer the long-run default-weighted average loss rate given default;

(bb) the bank may use a long-run default-weighted average loss rate given default to infer the appropriate PD;

(cc) the LGD ratio used to calculate the bank's IRB capital requirement shall not be less than the long-run default-weighted average loss rate given default;

(xi) shall, irrespective whether the bank is using external, internal, pooled data sources or a combination of the said three sources for the estimation of loss characteristics, be based on an underlying historical observation period of not less than five years provided that the bank may with the prior written approval of the Registrar place more reliance on recent data when the said data better reflects loss rates in respect of the bank's retail exposures;

(C) Based on the definition of default specified in regulation 67, a bank shall record all actual defaults in respect of all exposures subject to the IRB approach;

(D) When the status of a previously defaulted exposure subsequently changes, and as such no longer constitutes a defaulted exposure, the reporting bank shall rate the relevant obligor and estimate the relevant LGD ratio in a manner similar to a non-defaulted facility, provided that when the relevant exposure subsequently triggers one of the criteria relating to default, which criteria are specified in regulation 67, the relevant bank shall record a second default in respect of the said exposure;

(E) As a minimum, a bank-

(i) shall determine and specify a credit limit in respect of all authorised overdraft facilities, which credit limit-

(aa) shall in writing be brought to the attention of the relevant client of the bank;

(bb) shall on a continuous basis be monitored by the relevant bank for compliance with the limit by the relevant client;

(ii) shall assign a limit of zero to any unauthorised overdraft facility.

(F) Unless specifically otherwise provided, a bank that obtained the approval of the Registrar to apply the "top-down" approach for default risk and/or the IRB approach for dilution risk in respect of purchased corporate receivables or purchased retail receivables-

(i) shall group the relevant receivables into sufficiently homogeneous pools in order to accurately and in a consistent manner estimate PD ratios, LGD ratios or expected loss ratios for default risk and dilution risk;

(ii) shall comply with the relevant minimum risk quantification standards for retail exposures specified in item (B) above;

(iii) shall take into account all relevant information, including information in respect of the quality of the underlying receivables and data relating to similar pools;

(iv) shall establish whether or not the data provided by the seller in respect of the type, volume and on-going quality of the receivables are consistent with the bank's information;

(v) shall ensure that the bank maintains effective ownership and control over the cash remittances derived from the receivables, including in cases of seller or servicer distress or bankruptcy;

(vi) shall ensure that all relevant payments are forwarded completely and within the contractually agreed terms when the obligor makes payments directly to a seller or servicer;

(vii) shall be able to monitor the quality of the receivables and the financial condition of the seller or servicer;

(viii) shall assess any correlation between the quality of the receivables and the financial condition of the seller or servicer;

(ix) shall conduct periodic reviews in respect of sellers or servicers in order to-

(aa) verify the accuracy of any reports received from the seller or servicer;

(bb) detect any fraud or operational weaknesses;

(cc) verify the quality of the seller's credit policies and servicer's collection policies and procedures;

(x) shall duly document the findings of the reviews envisaged in sub-item (ix) above;

(xi) shall be able to assess the characteristics relating to the pool of receivable amounts, including-

(aa) any relevant over-advances;

(bb) the history relating to the seller's arrears, bad debts, and allowances for bad debt;

(cc) payment terms;

(dd) potential contra accounts;

(xii) shall receive timely and sufficiently detailed reports in respect of the ageing and dilution of receivable amounts in order to-

(aa) ensure continuous compliance with the bank's eligibility criteria and policies relating to purchased receivables;

(bb) monitor and confirm the seller's terms of sale;

(xiii) shall have in place clear and effective policies and procedures, and sufficiently robust information systems-

(aa) to detect any concentration risk within and across pools of receivable amounts;

(bb) to monitor compliance with all contractual terms of the facility, including covenants, advancing formulas, concentration limits and early amortisation triggers;

(cc) to monitor compliance with the bank's internal policies in respect of advance rates;

(dd) to limit inappropriate drawings;

(ee) to effectively deal with financially weakened sellers or servicers and/or a deterioration in the quality of the pool of receivable amounts;

(ff) to initiate legal actions or deal with problem receivables;

(gg) that specify all material elements of the bank's programme relating to purchased receivables, including-

(i) advance rates;

(ii) eligible collateral;

(iii) required documentation;

(iv) concentration limits;

(v) the manner in which cash receipts should be handled;

(hh) that ensure that funds are advanced only when specified supporting collateral and documentation such as servicer attestations, invoices or shipping documents are received;

(xiv) shall have in place an effective internal control process in order to assess the bank's continued compliance with all critical policies and procedures, which internal control process shall include-

(aa) regular internal and/or external audits of all critical phases of the bank's programme relating to purchased receivables;

(bb) verification of the separation of duties between-

(i) the assessment of the seller or servicer and the assessment of the obligor;

(ii) the assessment of the seller or servicer and the field audit of the seller or servicer;

(cc) evaluations of the effectiveness of the back-office operations, with specific emphasis being placed on qualifications, experience, staffing levels and supporting systems.

(vii) Unless specifically otherwise provided, a bank that obtained the prior written approval of the Registrar to adopt the internal model market-based approach for the measurement of the bank's risk exposure in respect of equity instruments held in the bank's banking book shall in addition to such conditions as may be determined by the Registrar continuously comply with the quantitative and qualitative requirements specified below.

(A) Quantitative requirements

In order to calculate a bank's risk exposure relating to equity positions held in the bank's banking book in terms of the internal model market-based approach, the bank-

(i) may use any type of value-at-risk ("VaR") model, including models based on variance-covariance, historical simulation or Monte Carlo, provided that the model-

(aa) shall duly capture all material risks contained in the bank's equity positions, including general market risk and specific risk exposure;

(bb) shall be sufficiently robust to adequately explain historical price variation;

(cc) shall duly capture the magnitude of and changes in any concentration risk;

(dd) shall be robust to adverse market conditions;

(ee) shall be appropriate for the risk profile and complexity of the bank's equity positions, including positions in respect of non-linear instruments such as options;

(ff) shall have good predictive power and shall not produce materially incorrect capital requirements;

(gg) may with the prior written approval of the Registrar incorporate portfolio correlations into the bank's internal risk measures provided that the said correlations shall be based on empirical evidence and analysis;

(ii) may use modelling techniques such as historical scenario analysis provided that the said modelling technique shall produce a capital requirement equivalent to a potential loss based on a 99^{th} percentile, one-tailed confidence interval of the difference between quarterly returns and the appropriate risk-free rate computed over a long-term sample period;

(iii) may use single or multi-factor models provided that-

(aa) the risk factors-

(i) shall be sufficient to capture the risks inherent in the bank's equity portfolio;

(ii) shall correspond to the appropriate equity market characteristics in which the bank holds significant positions;

(bb) the bank shall demonstrate by way of empirical analyses, to the satisfaction of the Registrar, the appropriateness of the risk factors, including the risk factors' ability to cover both general risk and specific risk;

(iv) shall calculate estimated losses, which estimated losses-

(aa) shall be sufficiently robust to adverse market movements;

(bb) shall be relevant to the long-term risk profile of the bank's specific equity holdings;

(cc) shall incorporate all relevant and material data, information and methods;

(dd) shall be based on-

(i) realistic long-run experience, including a period of a reasonably severe decline in equity prices;

(ii) a number of risk exposures in the sample and a data period sufficient to provide the bank with confidence in respect of the accuracy and the robustness of its estimates;

(v) shall use internal data and/or data from external sources, including pooled data, which data-

(aa) shall reflect the longest sample period for which data are available;

(bb) shall be meaningful in the sense that the data shall represent the risk profile of the bank's specific equity holdings;

(cc) shall be sufficient to provide conservative, statistically reliable and robust loss estimates;

(dd) shall be closely matched to or comparable with the bank's equity exposures;

(ee) shall be independently reviewed.

(B) Qualitative requirements

A bank that adopted the internal model market-based approach for the calculation of the bank's risk exposure in respect of equity instruments held in the bank's banking book shall comply with the relevant qualitative requirements specified in regulation 39(14)(a).

(viii) Data maintenance

As a minimum, a bank that adopted the IRB approach for the measurement of the bank's exposure to credit risk shall collect and store data in respect of all key borrower and facility characteristics, which data-

(A) shall provide effective support to the bank's internal credit risk measurement and management process;

(B) shall be sufficiently detailed to allow retrospective re-allocation of obligors and facilities to the bank's various risk grades;

(C) shall in the case of corporate, sovereign or bank exposures include-

(i) the rating histories in respect of obligors and eligible guarantors;

(ii) the date on which a rating was assigned;

(iii) the methodology, key data and the model/person used to derive the rating;

(iv) the identity of borrowers and facilities that defaulted, and the timing and circumstances of such defaults;

(v) the PD ratios and realised default rates associated with the bank's rating grades;

(vi) rating migration in order to keep track of the predictive power of the rating system;

(D) shall in the case of retail exposures include-

(i) the data that was used to allocate particular exposures to particular pools, including the data relating to borrower and transaction risk characteristics;

(ii) the data in respect of delinquent exposures;

(iii) data related to the estimated PD ratios, LGD ratios and EAD amounts associated with each relevant pool of exposures;

(E) shall in the case of defaulted retail exposures include data in respect of the pool to which the exposure was assigned during the year preceding the default and the realised outcomes in respect of the LGD ratio and the EAD amount.