

<b>Part A Overview</b> .....	<b>1</b>
1. Introduction.....	1
2. Risk-Weighted Assets (RWA) .....	1
<b>Part B Credit RWA</b> .....	<b>3</b>
3. Introduction.....	3
4. On-balance sheet items .....	3
5. Additional requirement for on-balance sheet items for investment banks .....	8
6. Conversion Factor (CCF) for off-balance sheet items.....	10
7. Credit risk weight for foreign exchange and interest rate contracts.....	11
8. Credit risk capital treatment for credit derivatives.....	14
9. Credit risk weight for Asset Backed Securitisation (ABS) transactions.....	17
<b>Part C Market RWA</b> .....	<b>23</b>
10. Introduction.....	23
11. Interest Rate Risk.....	23
12. Equity Risk.....	37
13. Foreign Exchange Risk (including gold positions) .....	42
14. Treatment of Options .....	45
<b>Part D Large Exposure Risk Requirements</b> .....	<b>53</b>
15. LERR for banking institutions .....	53
16. LERR for investment banks.....	53
<b>Appendices</b> .....	<b>55</b>
Appendix 1 Credit derivatives – requirements for effective risk transfer.....	55
Appendix 2 Credit derivatives – limitations to risk transfer.....	56
Appendix 3 Treatment of the interest rate derivative positions by product class....	59
Appendix 4 Examples and illustrations .....	62

BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 1/79
--------------------	--	--	-----------

## PART A OVERVIEW

### 1. Introduction

- 1.1. The capital adequacy framework (also known as the Risk-Weighted Capital Adequacy framework) sets out the approach for the computation of minimum capital required by a banking institution to operate as a going concern entity. The capital adequacy framework can be divided into three broad categories which consists of the general capital adequacy requirements, components of eligible regulatory capital and the Risk-Weighted Assets (RWA).
- 1.2. This document sets out the requirements on the computation of the Risk-Weighted Assets (RWA) developed based on the 1988 Basel Capital Accord<sup>1</sup>, designed to cover credit risk and then extended in 2004 to incorporate the assessment of capital in relation to market risks. This document should be read alongside the Risk-Weighted Capital Adequacy Framework (General Requirements).

### 2. Risk-Weighted Assets (RWA)

- 2.1. Capital as defined in the Risk-Weighted Capital Adequacy Framework (General Requirements) is compared against the level of the banking institution's RWA. The amount of RWA would be derived from different categories of assets and off-balance sheet exposures, weighted according to broad categories of relevant riskiness. The RWA consists of the following:

- 2.1.1. **Credit RWA**, which aims to measure the amount of credit risk<sup>2</sup> associated with a particular types of asset depending on the

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<sup>1</sup> "International Convergence of Capital Measurement and Capital Standards" issued by the Basel Committee on Banking Supervision (BCBS) in July 1988 and subsequent amendments to the Standards (including the requirements on capital assessment in relations to market risk).

<sup>2</sup> Credit risk is the risk of loss due to a obligor's non-payment of an obligation in terms of a loan or other lines of credit.

BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 2/79
--------------------	--	--	-----------

obligor;

2.1.2. **Market RWA**, which aims to measure the amount of market risk<sup>3</sup> associated with a particular type of asset depending on the obligor and tenor of the assets. This is specifically applicable to the interest rate risk and equity risk in the trading book, as well as foreign exchange risk in the entire balance sheet of the banking institution;

2.1.3. **Large Exposure Risk Requirement (LERR) RWA** for single equity, which aims to measure the amount necessary to accommodate a given level of a banking institution's large exposures to equity holdings; and

2.1.4. For investment banks:

- Counterparty Risk Requirement (CRR) RWA, which aims to measure the amount necessary to accommodate a given level of a Counterparty Risk<sup>4</sup> specifically to unsettled trades and free deliveries (arising from brokerage activities); and
- In addition to the requirement in paragraph 2.1.3, the LERR RWA for single counterparty, which aims to measure the amount necessary to accommodate a given level of its Large Exposure Risk<sup>5</sup> specifically to unsettled trades, free deliveries (arising from brokerage activities).

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<sup>3</sup> Market risk is defined as the risk of losses in on and off-balance sheet positions arising from movements in market prices.

<sup>4</sup> Counterparty Risk means the risk of a counterparty defaulting on its financial obligation to the banking institution.

<sup>5</sup> Large Exposure Risk means the risk arising from a proportionally large exposure to either a particular counterparty or a single equity.

## PART B CREDIT RWA

### 3. Introduction

3.1. The credit RWA is measured by classifying on-balance sheet assets<sup>6</sup> and assigning risk weights to each class of assets according to the relevant riskiness. It also incorporates off-balance sheet exposures, which bear a significant credit risk, calculated as follows:

- i) The conversion of off-balance sheet exposures into credit equivalent;  
and
- ii) The application of a risk weight to the credit equivalent according to the nature of the obligor.

The aggregate weighted on-balance sheet assets and weighted credit equivalent of the off-balance sheet exposures will form the total credit RWA which acts as the denominator<sup>7</sup> of the RWCR.

3.2. The classification of risk weights is kept as simple as possible and only 5 weights (0%, 10%, 20%, 50% and 100%) are used. Inevitably, there have been some broad-brush judgments made in deciding which weight would apply to different types of assets. Therefore, the weightings should not be regarded as a substitute for banking institutions' commercial judgment for purposes of market pricing of the different instruments.

### 4. On-balance sheet items

#### 4.1. 0% category

- i) Cash or claims collateralised by cash;
- ii) Claims on (including reverse repos with the Bank), guaranteed by, or collateralised by securities (including repos and reverse repos of securities) issued by the Federal Government of Malaysia and the

<sup>6</sup> Asset exposure amount is calculated as the outstanding amount net of specific provisions made.

<sup>7</sup> Refer to the RWCR calculation given in the document "Risk Weighted Capital Adequacy Framework (General Requirements)".

BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 4/79
--------------------	--	--	-----------

Bank;

- iii) Claims on and guaranteed by the Organisation for Economic Co-operation and Development (OECD)<sup>8</sup> central governments and central banks<sup>9</sup>;
- iv) Claims collateralised by securities (including repos and reverse repos of securities) issued by the OECD central-governments<sup>10</sup>;
- v) Claims on non-OECD central governments and central banks denominated in the national currency (of the debtor) and funded by liabilities in the same currency<sup>11</sup> ;
- vi) Ringgit denominated bonds issued by Multilateral Development Banks (MDBs) and Multilateral Financial Institutions (MFIs)<sup>12</sup>;
- vii) Holdings of ABF Malaysia Bond Index Fund;
- viii) Ringgit denominated bonds issued by Kreditanstalt für Wiederaufbau (KfW) Bankengruppe; and
- ix) Sukuk Bank Negara Malaysia – Ijarah.

#### 4.2. 10% category

- i) Holdings of Cagamas debt securities issued before 4 September 2004<sup>13</sup> (risk weight remains until these securities are redeemed);

<sup>8</sup> For this purpose, OECD countries would include Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States and Saudi Arabia. These countries are regarded as nations with high credit standing. Claims on the rest of the world are regarded as bearing significant country transfer risk. An OECD bank is a bank incorporated in any of the OECD countries. Branches of OECD banks in non-OECD countries are also deemed to be OECD banks, for example, an OECD bank's branch in Singapore (a non-OECD country).

<sup>9</sup> Commercial loans partially guaranteed by these bodies will attract equivalent low weights on that part of the loan which is fully covered.

<sup>10</sup> Loans partially collateralised by cash or securities issued by these bodies will attract equivalent low weights on that part of the loan which is fully covered.

<sup>11</sup> The 0% weightage reflects the absence of risks relating to the availability and transfer of foreign exchange on such claims.

<sup>12</sup> MDBs currently eligible for a 0% risk weight are the World Bank Group, which comprises the International Bank for Reconstruction and Development (IBRD) and the International Finance Corporation (IFC), the Asian Development Bank (ADB), the African Development Bank (AfDB), the European Bank for Reconstruction and Development (EBRD), the Inter-American Development Bank (IADB), the European Investment Bank (EIB), the European Investment Fund (EIF), the Nordic Investment Bank (NIB), the Caribbean Development Bank (CDB), the Islamic Development Bank (IDB), and the Council of Europe Development Bank (CEDB). The Bank shall inform banking institutions on any updates to this list.

<sup>13</sup> Please refer to paragraph 4.3 for treatment of Cagamas debt securities issued after that date.

BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 5/79
--------------------	--	--	-----------

and

- ii) Other claims on Cagamas Berhad (Cagamas).

#### 4.3. 20% category

- i) Claims (all maturities) on, guaranteed by or collateralised by securities<sup>14</sup> issued by licensed banking institutions in Malaysia (including branches of foreign banking institutions operating in Malaysia);
- ii) Claims on and guaranteed by banking institutions incorporated in the OECD;
- iii) Claims on, guaranteed by, or collateralised by securities issued by domestic development banking institutions<sup>15</sup>;
- iv) Claims on, guaranteed by, or collateralised by securities issued by other MDBs (other than those eligible for 0% risk weight above);
- v) Claims (with a residual maturity of up to one year) on and guaranteed by banking institutions incorporated in countries outside the OECD
- vi) Claims on and guaranteed by domestic non-central governments (i.e. state governments) and other public sector entities established by statute;
- vii) Claims on and guaranteed by OECD public-sector entities, excluding central government;
- viii) Investments in the share capital of the Credit Guarantee Corporation (CGC);
- ix) CGC guaranteed portions of all new Principal Guarantee Scheme Loans;

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<sup>14</sup> This includes:

- Negotiable Certificate of Deposits issued and Bankers Acceptances accepted by, such banking institutions;
- reverse repos of instruments with licensed banking institutions, which are treated as collateralised loans to these institutions [except where the collateral belongs to a lower risk category (e.g. Malaysian Government Securities and Treasury Bills, reverse repos of which will be weighted at 0%)]

<sup>15</sup> Bank Pertanian Malaysia, Bank Pembangunan dan Infrastruktur Malaysia, Bank Perusahaan Kecil dan Sederhana Malaysia Berhad (formerly known as Bank Industri dan Teknologi Malaysia Berhad), Export-Import Bank of Malaysia Berhad, Bank Simpanan Nasional and Bank Kerjasama Rakyat Malaysia Berhad.

BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 6/79
--------------------	--	--	-----------

- x) Housing loans and hire purchase and leasing debts purchased by an intermediary banking institution from an originating banking institution<sup>16</sup> (ie. sold to Cagamas under the back-to-back arrangement);
- xi) First, second, third and fourth tranche<sup>17</sup> of the residential mortgage-backed securities (RMBS) issued by Cagamas MBS Berhad and backed by underlying pool of Government of Malaysia's staff housing loans;
- xii) Holdings of Cagamas debt securities<sup>18</sup> issued after 4 September 2004;
- xiii) Islamic CP/MTN programme by Rantau Abang Capital Berhad (a wholly-owned subsidiary of Khazanah Nasional Berhad), provided the programme maintains a AAA/P1/MARC-1 rating by a recognised rating agency.

#### 4.4. 50% category

- i) Loans secured by mortgage<sup>19</sup> on residential property, subject to the following conditions:
  - i. That is or will be occupied by the borrower or is rented; and
  - ii. Secured by first charge on the property.

#### 4.5. 100% category

- i) Claims on banking institutions incorporated outside the OECD with a

<sup>16</sup> Please refer to paragraph 4.5 for treatment on purchases made from a non-banking institution.

<sup>17</sup> Please refer to "Risk Weighted Capital Adequacy Framework (General Requirements)" on the deductions required for subordinated tranches

<sup>18</sup> Please refer to paragraph 4.2 for treatment of Cagamas debt securities issued before that date.

<sup>19</sup> It is not applicable to loans to companies engaged in speculative residential building or property development. In the case of refinancing of housing loans leading to a full repayment of the original outstanding housing loans with the remaining amount used for business, investment or consumption purposes, the part used to refinance the original outstanding housing loans would be eligible for the 50% weight, while the other part used for business, investment or consumption purposes would be subject to 100% weight. Borrowings by a house owner secured against his house, for business, investment or consumption purposes should not be accorded the preferential treatment that is granted to housing finance for residential purposes. In the case of a single claim involving both a housing loan and an overdraft, the exposure is to be broken down into both exposures and the housing loan is given a 50% RW whilst the overdraft is accorded a 100% RW. Where the exposure is unable to be broken down, a 100% RW applies.

BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 7/79
--------------------	--	--	-----------

residual maturity of over one year;

- ii) Holdings of capital instruments rated BB- and above issued by non locally-incorporated banking institutions;
- iii) Claims on non-OECD central governments other than those denominated in national currency (of the debtor) and funded in that currency;
- iv) Claims on commercial companies owned by the public sector (Non-Financial Public Enterprises (NFPEs));
- v) Investments in shares (other than those deducted from the capital base);
- vi) Other claims on the private sector, which includes loans and advances and corporate debt securities;
- vii) Loans for business, investment or consumption purposes collateralised by residential property;
- viii) For housing loans cum revolving credit/overdraft facility, the remaining amount which is not attributable to housing loans (fully secured by mortgage on residential property that is or will be occupied by the borrower or is rented). However, If unable to segregate, the whole facility is provided a 100% risk weight;
- ix) Non-performing housing loans secured by first charge;
- x) Housing loans and hire purchase and leasing debts purchased from the originating non-banking institution (except domestic development banks as defined under this Framework), which are sold to Cagamas under a back-to-back sale arrangements;
- xi) Claims from universal brokers (both interbank and non-interbank);
- xii) Holdings of capital instruments of other licensed banking institutions which, in isolated cases, are transferred from trading to banking book under the non-deduction rule; and
- xiii) All other assets (including investment in fixed assets).

#### **4.6. 150% category**

- i) Holdings of capital instruments rated below BB- issued by non locally-incorporated banking institutions.



BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 8/79
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## 5. Additional requirement for on-balance sheet items for investment banks

5.1. Investment banks shall calculate Counterparty Risk Requirement (CRR) RWA, which aims to measure the amount necessary to accommodate a given level of a Counterparty Risk<sup>20</sup> specifically for unsettled trades<sup>21</sup> and free deliveries with respect to its equity business. The CRR will be measured as per below. The CRR will be multiplied by a factor of 12.5 to arrive at the CRR RWA.

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<sup>20</sup> Counterparty Risk means the risk of a counterparty defaulting on its financial obligation to the banking institution.

<sup>21</sup> An unsettled agency purchase/sale or an unsettled principal sale/purchase.

### Agency Trade Transactions

	Time Period	CRR
Sales contract	Day, T to T+2	CRR = 0
	T+3 to T+30	CRR = 8% of market value (MV) of contract X Counterparty Risk Weight, if current MV of contract > transaction value of contract CRR = 0, if current MV of contract <= transaction value of contract
	Beyond T+30	CRR = MV of contract X Counterparty Risk Weight, if current MV of contract > transaction value of contract CRR = 0, if MV of contract <= transaction value of contract
Purchase contract	Day, T to T+3	CRR = 0
	T+4 to T+30	CRR = 8% of MV of contract X Counterparty Risk Weight, if MV of contract < transaction value of contract CRR = 0, if MV of contract >= transaction value of contract
	Beyond T+30	CRR = MV of contract X Counterparty Risk Weight, if MV of contract < transaction value of contract CRR = 0, if MV of contract >= transaction value of contract

### Principal Trade Transactions

	Time Period	CRR
Sales contract	Day, T to T+3	CRR = 0
	T+4 to T+30	CRR = 8% of MV of contract X Counterparty Risk Weight, if MV of contract < transaction value of contract CRR = 0, if MV of contract >= transaction value of contract
	Beyond T+30	CRR = MV of contract X Counterparty Risk Weight, if MV of contract < transaction value of contract CRR = 0, if MV of contract >= transaction value of contract
Purchase contract	Day, T to T+3	CRR = 0
	T+4 to T+30	CRR = 8% of MV of contract X Counterparty Risk Weight, if MV of contract > transaction value of contract CRR = 0, if MV of contract <= transaction value of contract
	Beyond T+30	CRR = MV of contract X Counterparty Risk Weight, if MV of contract > transaction value of contract CRR = 0, if MV of contract <= transaction value of contract

### Free Deliveries<sup>22</sup>

Time Period	CRR
Day, D23 to D+1	CRR = 8% of Transaction value of contract X Counterparty Risk Weight
Beyond D+1	CRR = Transaction value of contract

<sup>22</sup> Where an investment bank delivers equities without receiving payment, or pays for equities without receiving the equities.

<sup>23</sup> Due date where the investment bank delivers equities without receiving payment shall be the date of such delivery, and where the investment bank pays for equities without receiving the equities, shall be the date of such payment.

## 6. Conversion Factor (CCF) for off-balance sheet items

6.1. A relatively simple and approximate methodology is used to incorporate off-balance sheet exposures into the risk-weighted capital ratio. It entails the conversion of the credit risk inherent in each off-balance sheet instrument into an on-balance sheet equivalent (credit equivalent) by multiplying the nominal principal amount by a credit conversion factor; the resulting amount then being weighted according to the nature of the counterparty. The credit conversion factors for various types of instruments are as follows:

	Instruments	CCF
i)	Direct credit substitutes, such as general guarantees of indebtedness (including standby letters of credit serving as financial guarantees for loans and securities) and acceptances (including endorsements with the character of acceptances)	100%
ii)	Certain transaction-related contingent items, such as performance bonds, bid bonds, warranties and standby letters of credit related to particular transactions	50%
iii)	Short-term self-liquidating trade-related contingencies, such as documentary credits collateralised by the underlying shipments	20%
iv)	Assets sold with recourse, where the credit risk remains with the selling institution <sup>24</sup>	100%
v)	Forward asset purchases, and partly-paid shares and securities, which represent commitments with certain drawdown <sup>25</sup>	100%
vi)	Obligations under an on-going underwriting agreement (including underwriting of shares/ securities issue) and revolving underwriting facilities	50%
vii)	Other commitments, such as formal standby facilities and credit lines, with an original maturity of over one year	50%
viii)	Similar commitments [as in (vii)] with an original maturity of up to one year, or which can be unconditionally cancelled at any time	0%

<sup>24</sup> These items, which include housing loans sold to Cagamas, should be weighted according to the type of asset (i.e. housing loans) and not according to the counterparty (i.e. Cagamas) with whom the transaction has been entered into. The institution is only exposed to credit risk inherent in the assets 'sold' with recourse.

<sup>25</sup> Similarly as in (iv), the credit equivalent of item (v) should be weighted according to the type of asset and not the counterparty.

BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 11/79
--------------------	--	--	------------

## 7. Credit risk weight for foreign exchange and interest rate contracts

7.1. Banking institutions are not exposed to credit risk for the full face value of their foreign exchange and interest rate contracts, but only to the potential cost of replacing the cash-flow if the counterparty defaults. The credit equivalent amounts will depend, inter alia, on the maturity of the contract and on the volatility of the rates underlying that type of instrument.

7.2. Exchange rate contracts would include:

- i) Cross-currency interest rate swaps;
- ii) Forward foreign exchange contracts;
- iii) Currency futures;
- iv) Currency options purchased; and
- v) Other similar instruments;

But, exclude contracts with an original maturity of 14 calendar days or less.

7.3. Interest rate contracts are defined to include:

- i) Single-currency interest rate swaps;
- ii) Basis swaps;
- iii) Forward rate agreements;
- iv) Interest rate futures;
- v) Interest rate options purchased; and
- vi) Other similar instruments

7.4. The netting of contracts subject to novation would be permitted. Therefore, the net rather than the gross claims arising out of swaps and similar contracts (subject to novation) with the same counterparties would be weighted. In this context, novation is defined as a bilateral contract between two counterparties under which any obligation to each other to deliver a given currency on a given date is automatically amalgamated with all other obligations for the same currency and value date, legally

BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 12/79
--------------------	--	--	------------

substituting one single net amount for the previous gross obligations.

- 7.5. The credit equivalent amounts of exchange rate and interest rate contracts are to be weighted according to the category of counterparty. For exchange rate and interest rate related contingencies, however, a 50% weight will be applied in respect of counterparties which would otherwise attract a 100% weight. This is to reflect the low record of loss as most counterparties in these markets are of high credit standing.
- 7.6. Under the current exposure method, computation of credit equivalent exposure for interest rate and exchange rate related contracts is based on the summation of the following two elements:
- i) The replacement costs (obtained by marking-to-market) of all contracts with positive value (zero for contracts with negative replacement costs); and
  - ii) The amount of potential future exposure calculated by multiplying the national value of each contract by an “add-on” factor.

$$\text{Credit exposure} = \text{positive MTM} + (\text{NP} \times \text{“add-on” factor (\%)})$$

where : MTM is Mark-to-Market

NP is National Principal

(Illustration of calculation under the current exposure method is given in **Example 1** in **Appendix 4**)

- 7.7. In certain cases, credit exposures arising from interest rate and exchange rate related contracts may already be reflected on balance sheet. For example, banking institutions may have recorded current credit exposures to counterparties (such as mark to market values) under foreign exchange and interest rate related contracts on the balance sheet as ‘other assets’ or ‘sundry debtors’. To avoid double counting, such exposures should be excluded from the on-balance sheet exposures and treated as off-balance sheet exposures subject to the current exposure method.

7.8. The choice of “add-on” factors in computing the potential future exposure is determined based on the type of exposure and the residual maturity of each contracts. The “add-on” factors for contracts with interest rate exposure and foreign exchange rate exposure are listed as follows:

**Table 1: “Add-on” factors for derivative contracts with interest rate exposures**

Residual maturity	Factor (%)
14 calendar days	Nil
> 14 calendar days and 6 months	0.10%
>6 months and 1 year	0.25%
> 1 year and 2 years	1.0%
> 2 year and 3 years	2.0%
> 3 year and 4 years	3.0%
> 4 year and 5 years	4.0%
> 5 year and 6 years	5.0%
> 6 year and 7 years	6.0%
for each additional year	add 1.0%

**Table 2: “Add-on” factors for derivative contracts with foreign exchange exposures**

Residual maturity	Factor (%)
14 calendar days	Nil
> 14 calendar days and 6 months	1.5%
>6 months and 1 year	3.0%
> 1 year and 2 years	5.0%
> 2 year and 3 years	7.0%
> 3 year and 4 years	8.0%
> 4 year and 5 years	9.0%
> 5 year and 6 years	10.0%
> 6 year and 10 years	11.0%
> 10 years	12.0%

7.9. The following area additional note for the “add-on” factors are as follows:

- i) For derivative contracts which are sensitive to movements in both the interest and exchange rates, the “add-on” factors used will be the summation of the “add-on” factors for interest rate exposures and the

“add-on” factors for exchange rate exposures of the relevant residual maturity bucket;

- ii) For contracts with multiple exchanges of principal, the notional principal amount is the sum of the remaining exchanges of principal;
- iii) Exchange traded derivative contracts with strict daily mark-to market margining requirement is excluded from this framework<sup>26</sup>; and
- iv) For single currency floating-to-floating interest rate swaps, the “add-on” factor is zero. Thus, the credit exposure for such contracts will comprise only the positive mark-to-market value.

7.10. For both forward rate agreements and over-the-counter interest rate contracts of similar nature which are settled in cash on start date, residual maturity is measured as the sum of the remaining contract period and the underlying tenor of the contract (Illustration is provided in **Example 2 of Appendix 4**). Institutions may choose to apply discounts to the “add-on” factors if the remaining contract period, as a fraction of residual maturity, falls within a certain range based on the following:

**Table 3: Discount factor and range of residual maturity**

t = Remaining contract period residual maturity	Discount to “Add-on” Factor
t < 0.01	75%
0.01 t < 0.05	50%
0.05 t < 0.10	25%
0.10 t < 0.65	no discount
0.65 t < 0.80	25%
0.80 t < 0.90	50%
t < 0.90	75%

## 8. Credit risk capital treatment for credit derivatives

<sup>26</sup> This shall include the 3 month KLIBOR Futures Contracts, 3 and 5-year MGS Futures Contracts, KLSE Composite Index Futures Contracts and KLSE Composite Index Options Contracts. The credit risk for these excluded contracts shall be based on the outstanding margin placed with the broker for all outstanding trades, weighted by the relevant counterparty risk weights.

BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 15/79
--------------------	--	--	------------

8.1. The capital treatment for credit derivative instruments<sup>27</sup> held in the banking book is prescribed below. The requirements for an effective risk transfer as well as the limitations to risk transfer is given in **Appendices 1 and 2** respectively.

8.2. Credit Default Swap (CDS)

- i) Where protection is purchased using a CDS referenced to a single reference entity, the protection buyer may replace the risk weight of the reference asset with the risk weight of the protection seller. The amount of protection that may be recognised is determined by the credit event payment or settlement amount. This could be payment of par value or other specified value in exchange for physical delivery of the reference asset, or payment of par less recovery value or payment of fixed amount as per the CDS agreement. For the unprotected portion, the risk weight of the reference asset will apply.
- ii) Where protection is sold<sup>28</sup> via a CDS referenced to a single reference entity, the protection seller acquires an exposure to the specific risk of that entity. In this case, the risk weight that must be applied to the exposure is the risk weight attached to the reference entity. The amount of the exposure is the maximum possible amount payable under the terms of the credit derivative contract if a credit event were to occur.

8.3. First-to-Default Baskets (FTDB)

- i) Where an institution has purchased protection using a credit derivative that is referenced to more than one entity and that protection terminates after a credit event occurs on any of those entities, protection is only recognized against one entity in the basket. The protection buyer may choose which entity is protected, with the risk weight of that entity being replaced by the risk weight of

<sup>27</sup> Please refer to paragraph 11.5 for more information on regulatory treatment for credit derivatives held in the trading book.

<sup>28</sup> Where a banking institution has sold protection using a credit derivative, it should be assumed that 100% of the specific risk is purchased irrespective of the range of credit events specified.



BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 16/79
--------------------	--	--	------------

the protection seller.

- ii) If the contract allocates protection proportionately amongst assets in the basket (sometimes known as a green bottle structure), protection is recognised in setting capital requirements against all the assets in the basket according to the proportions in the contract. Thus, if there is two reference entities in a RM100 million contract (one with a 100% risk weight and a 20% share of protection and the other with a 20% risk weight and a 80% share of protection), the risk-weighted exposure is RM36 million (i.e. RM20 million x 100% + RM80 million x 20%).
- iii) Where an institution has sold protection using a FTDB product, capital must be held against all the reference entities in the basket<sup>29</sup>. The risk-weighted exposure arising from the credit derivative will be the sum of the individual risk-weighted exposures in the basket, with the amount of capital held capped at the maximum payout possible under the contract.

#### 8.4. Credit-Linked Notes (CLN)

- i) Where protection is purchased using a CLN, the protection buyer is not required to calculate a specific risk capital charge because the risk weight of any funded protection acquired or cash collateral attracts zero risk weight. However, the amount of protection that may be recognised is determined by the amount of funding received. Where protection is sold via a CLN, the protection seller acquires an exposure to both the reference entity and the protection buyer, with the amount of the exposure being the face value of the note. To account for this exposure, the higher of the risk weights applicable to the reference asset or the protection buyer must be applied to the exposure.

#### 8.5. Total Rate of Return Swap (TRORS)

- ii) Where protection is purchased using a TRORS, the protection buyer

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<sup>29</sup> The Bank may at its discretion, waive this additive rule on a case-by-case basis, if it can be demonstrated to the Bank's satisfaction, that there is a very strong correlation between the assets in the baskets.

BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 17/79
--------------------	--	--	------------

may replace the risk weight of the reference asset with the risk weight of the protection seller. Similarly to a CDS, the amount of protection that may be recognised is determined by the credit event payment or settlement amount. Protection sold via a TRORS should be included in the protection seller's trading book with the exception of those that are hedging an underlying banking book exposure.

- iii) These instruments differ from typical direct credit substitutes in that they cover not only the default of the reference obligation but any changes in its market value. Changes in market value may be settled frequently, exposing a bank to significant market risk that is not captured by the capital treatment of the Banking book.

8.6. Banking institutions may only net notional positions in reference assets created by credit derivatives with positions in underlying assets or other notional positions created by other credit derivatives if these positions are equal and opposite in all respects. Where the notional positions are equal and opposite in all respects other than tenor, the specific risk capital charges cannot be offset. Instead, a single specific risk charge should be calculated, based on the reference entity.

## 9. Credit risk weight for Asset Backed Securitisation (ABS) transactions

9.1. The capital treatment for ABS transactions held in the banking book is prescribed below:

9.2. Asset Transfer

- i) Where asset transfer satisfies the true sale criteria set by the Securities Commission (SC) and other provisions contained in the prudential standards<sup>30</sup> such that risks have been effectively transferred to the SPV, the originating banking institutions are

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<sup>30</sup> For more information on prudential standards for ABS transactions, please refer to the Prudential Standards on Asset Backed Securitisation, issued by the Bank on 10 March 2003.

BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 18/79
--------------------	--	--	------------

allowed to exclude the assets from the computation of the risk-weighted capital ratio, upon receiving written consent/confirmation from the Bank and approval of the SC. If subsequently the Bank finds that any of the true sale criteria have not been complied with, or substantial risks have not been effectively transferred, the originating institution would be required by the Bank to hold capital against the transferred assets partially, or fully as if the assets had remained on its books.

- ii) Although capital relief is given to the originating banking institutions upon effective transfer of the risks, capital requirement would still be imposed should the institutions continue to retain credit exposure by way of providing credit enhancements and liquidity facilities.
- iii) While accounting standards would have implication on whether the asset sold is taken off the balance sheet for financial reporting purposes, interpretation of accounting standards that lead to the requirement for consolidation of SPV into the originator's book should not result in the non-eligibility of the originating banking institution for the capital relief.

### 9.3. Credit Enhancement

- i) Banking institutions may provide credit enhancement facilities in order to improve the credit attractiveness of a securitisation scheme. These facilities may be in the form of first or second loss facilities that include but are not limited to arrangements such as subordinated loan facilities, over-collateralisation or cash collaterals.

#### *First Loss Facility*

- ii) First loss credit enhancement facility represents the first level of protection against potential loss. This amount is determined with the rating agencies based on certain formula such as the multiples of expected loss of the asset pool or certain minimum levels of overcollateralisation and interest cover ratios with a view to secure a particular rating for the senior classes. First loss credit enhancement

BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 19/79
--------------------	--	--	------------

can be provided in several forms such as a subordinated investment, capitalisation of the SPV, or over-collateralisation (discussed separately below). Irrespective of its form, the purpose of first loss credit enhancement is to absorb any losses in the asset pool caused by the risks to which the asset pool is exposed to.

- iii) Where a banking institution (both originating and third party banking institution) provides first loss facility, directly or indirectly to the SPV, the banking institution is required under the capital adequacy framework to deduct the full amount of the facility from its capital base (i.e total capital). The deduction will however, be capped at the amount which would have been provided for as if the entire assets were to remain or appear in the institution's balance sheet. In this respect, unqualified liquidity facilities (which do not meet the specified requirement<sup>31</sup>) could be deemed as an implicit credit enhancement, which may require more capital buffer.
- iv) In cases where the asset transferred to the SPV is more than the total amount of securities being issued by the SPV, the difference between the two values would normally constitute an over-collateralisation amount (transferred as security). This could act as a first loss facility in which case will require capital deduction by the originating banking institution, unless provision has been made through the income statement.
- v) A first loss facility may also be in the form of a maintenance of cash collateral account, where cash is provided upfront by the provider of the credit enhancement. Banking institutions that provide such facility as first loss facility would normally write off that amount in the income statement, failing which, the amount (i.e outstanding amount) would have to be deducted from its capital base (total capital) under the capital adequacy computation.
- vi) Credit enhancement could also be provided through the structure of the securities issued itself. This will involve the issuance of senior

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<sup>31</sup> Please refer to the Prudential Standards on Asset Backed Securitisation, issued by the Bank on 10 March 2003 for the prescribed specifications.

BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 20/79
--------------------	--	--	------------

and subordinated securities, the latter is normally unrated and held by the originator as a form of first loss facility, in which case, capital deduction is applied.

- vii) The maintenance of excess spread<sup>32</sup> accounts within the SPV could also be a form of credit enhancement. If the excess spread is provided as first loss facility and has been captured as a gain on sale (and therefore become part of the capital of the originating institution), the amount shall be deducted from the capital base.

*Second loss facility*

- viii) A credit enhancement facility will be treated as 'second loss facility' if it ranks above the first loss facility that has been agreed by the Bank. Such facility is often rated lower than BBB or equivalent quality and is often provided as protection against the mezzanine risks tranches. Banking institutions that provide 'second loss facility' shall assign a 100% risk weight to the facility on its balance sheet.
- ix) Where various credit enhancements are given for a transaction in a hierarchy (that is, one being senior to the other in terms of allocation of cashflows), the Bank may consider the senior ones among the several enhancements as being a 'second loss' in limited circumstances, where the Bank has to be satisfied that the junior forms of credit enhancement are sufficient as a first loss facility. For instance, if there is an over collateralisation as well as a subordinated debt security in a transaction, where the level of over-collateralisation is considered sufficient and no less than that enjoyed by any BBB-rated tranche in a securitisation transaction, the subordinated debt may be treated as second loss piece. In such circumstances, banking institutions shall demonstrate to the Bank their claim on the quality of the unrated/subordinated tranche to be treated as 'second loss' and shall obtain the opinion of the rating agencies as to the quality of the subordinated tranche.

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<sup>32</sup> The difference between the return at which the pool is transferred to the SPV and the weighted average cost of the funding raised by the SPV

BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 21/79
--------------------	--	--	------------

- x) In the event of downgrades of the second loss facility, the facility may continue to be treated as 'second loss' and held by banking institutions. However, the Bank reserves the right to assign a higher risk weight, require provision to be made, or reclassify the facility as first loss (in which case capital deduction is required and subject to the 8% cap) should the situation warrant.
- xi) In any traditional securitisation where several forms of credit enhancements are involved, the originating banking institutions must be able to demonstrate to the Bank the order in which they will be used to absorb losses from the underlying assets.
- xii) Where credit enhancements provided are other than those mentioned herein (e.g. third party credit enhancements), the principles in the preceding paragraphs as well as existing capital adequacy framework shall apply. Banking institutions are advised to discuss with the Bank the regulatory impact of providing such a facility.
- xiii) While an originating banking institution is allowed to provide both first and second loss facility, the Bank reserves that right to require that the second loss facility be provided by a third party, which could be another banking institution, under certain circumstances such as deteriorating capital strength of the originating banking institution.

#### 9.4. Servicing and Liquidity Facilities

- i) A banking institution may become a service provider or servicer to the SPV directly, which includes remitting funds provided as a liquidity facility until it has received funds generated from the underlying assets.
- ii) Liquidity facilities that fulfil all the prescribed conditions<sup>33</sup> would be deemed to have limited credit risks. Such facilities would primarily be cash advances and for capital purposes, may be treated as commitments that are converted to an on-balance-sheet equivalent

<sup>33</sup> Please refer to the Prudential Standards on Asset Backed Securitisation, issued by the Bank on 10 March 2003 for the prescribed conditions.

<b>BNM/RH/GL 001 - 21</b>	<b>Prudential Financial Policy Department</b>	<b>Risk-Weighted Capital Adequacy Framework (Basel I)</b>	<b>Page 22/79</b>
---------------------------	---	---	-----------------------

of 20% and assigned 100% risk weight (except in the case of Cagamas being the SPV, where the risk weight is 10%). In the event that any of the conditions for liquidity provider is not met, the banking institution could be deemed to be providing credit enhancement, resulting in additional capital or provision having to be made against the facility.

#### 9.5. Underwriting

- i) A banking institution may also act as underwriter for securities issued by an SPV. If as a result of underwriting, a banking institution ends up holding more than 10% of total ABS issued (excluding first loss facility) or more than its single customer credit limit (SCCL), whichever is lower, it is given a maximum of 90 days to reduce the holding so as to observe the limit. The Bank reserves the right to require additional capital to be provided should a banking institution fail to comply with the requirements.
- ii) A banking institution acting as an underwriter may treat the facility as an underwriting obligation for capital adequacy purposes with a 50% credit conversion factor and a 100% risk weight covering the amount of the facility.

## PART C MARKET RWA

### 10. Introduction

10.1. The capital treatment for market risk addresses:

- i) The interest rate and equity risks pertaining to financial instruments<sup>34</sup> in the trading book; and
- ii) Foreign exchange risk in the trading and banking books.

### 11. Interest Rate Risk

11.1. The minimum capital requirement for interest rate risk is the summation of the capital charges for:

11.1.1. Specific risk of each security, whether it is a short or a long position; and

11.1.2. General market risk, where long and short positions in different securities or instruments may be off-setted.

#### 11.2. Specific risk

11.2.1. The capital requirements for specific risk is designed to protect against adverse movements in the price of an individual security owing to factors related to the issuer. In measuring the risk, offsetting will be restricted to matched positions in the identical issue (including positions in derivatives). Even if the issuer is the same, no offsetting is permitted between different issues since differences in coupon rates, liquidity, call features, etc. mean that prices may diverge in the short run. Table 4 specifies the applicable specific risk charges for interest rate related financial instruments for issuers of G10 and non-G10 countries<sup>35</sup>.

<sup>34</sup> Includes both conventional and Islamic principle based financial instruments.

<sup>35</sup> The Group of Ten (G10) is made up of eleven industrial countries namely Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Sweden, Switzerland, the United Kingdom and the United States.



**Table 4: Specific Risk Charges for Interest Rate Related Financial Instruments of G10 and non-G10 Issuers**

	Remaining Maturity									
	<= 6 mths		>6m to 1yr		>1 to 2 yrs		>2 to 5yrs		> 5 yrs	
	G10 (%)	Non G10 (%)	G10 (%)	Non G10 (%)	G10 (%)	Non G10 (%)	G10 (%)	Non G10 (%)	G10 (%)	Non G10 (%)
<b>Corporates</b>										
P1 to P3	0.25	0.25	1.00	1.00						
AAA to A	0.25	0.25	1.00	1.00	1.00	2.00	1.60	2.00	1.60	3.00
BBB <sup>36</sup>	0.25	0.25	1.00	1.00	1.00	2.00	1.60	3.50	1.60	4.50
<b>Malaysian Government<sup>37</sup></b>	0									
<b>Foreign Sovereigns</b>										
AAA to AA	0									
A to BBB	0.25		1.00		1.00		1.60		1.60	
<b>Financial Inst<sup>38</sup></b>	0.25		1.00		1.00		1.60		1.60	
<b>Others</b>	8.00									

### 11.3. General risk

11.3.1. The capital requirements for general risk are designed to capture the risk of loss arising from changes in market interest rates. Within the standard approach, a choice between two principal methods of measuring the risk is permitted; "maturity" method or "duration" method. Upon adoption of a method, banking institutions are not allowed to switch between methods without the consent of the Bank. In each method, positions are allocated across a maturity ladder template of time bands and the capital charge is then

<sup>36</sup> Includes, subject to supervisory approval, interest rate related financial instruments which are unrated but deemed to be of comparable investment quality by the banking institution, and where the issuer has securities listed on a recognized stock exchange.

<sup>37</sup> Including interest rate related financial instruments issued and guaranteed by the Malaysian Government, the Bank, Danaharta, and Danamodal.

<sup>38</sup> Including interest rate related financial instruments issued and guaranteed by licensed banking institutions, licensed development financial institutions, discount houses and Cagamas Berhad.

BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 25/79
--------------------	--	--	------------

calculated as the sum of three components:

- i) The net short or long weighted position across the entire time bands<sup>39</sup>;
- ii) The smaller proportion of the matched positions in each time band to capture basis risk (the "vertical disallowance"); and
- iii) The larger proportion of the matched positions across different time bands to capture yield curve risk (the "horizontal disallowance").

11.3.2. Separate maturity ladder templates should be used for positions exposed to different currency interest rate risk. Non-Ringgit positions must be translated into Ringgit equivalent based on reporting date spot foreign exchange rates. Capital charges for general interest rate risk should be calculated for each currency separately and then aggregated with no offsetting between positions of different currencies. Two different sets of risk weights (refer to Table 5) and yield changes (refer to Table 7) would be applicable depending on whether the interest rate related financial instrument is exposed to a G10 or non-G10 currency interest rate risk.

11.3.3. In calculating general risk, banking institutions may exclude all long and short positions (both actual and notional) in identical instruments with the same issuer, coupon, currency and maturity, from the calculations. No offsetting will be allowed between positions in different currencies; the separate legs of cross-currency swaps or forward foreign exchange deals are to be treated as notional positions in the relevant instruments and included in the appropriate calculation for each currency interest rate risk.

#### **11.3.4. General risk – Maturity method**

- i) In the maturity method, the market value of long or short positions in debt securities and other sources of interest rate

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<sup>39</sup> Positions include delta-weighted option position in the case where the institution decides to use the Delta-plus Method for the treatment of options.

exposures, including derivative instruments, are slotted into a maturity ladder comprising 13 time bands. These time bands are specified in Table 5 below. Fixed-rate instruments shall be allocated according to the residual term to maturity and floating-rate instruments according to the residual term to the next repricing date.

- ii) The first step in the calculation of the capital charge is to weight the positions in each time band by a factor designed to reflect the price sensitivity of those positions to assumed changes in interest rates. The risk weights for each time band are set out in the third and fourth column of Table 5 according to the type of currencies which the instruments are denominated in, either G10 or non-G10 countries' currencies. The net short or long weighted position is then obtained.

**Table 5: General interest rate risk weights for financial instruments exposed to G10 or non-G10 currency interest rate risk**

Zone	Time bands	G10 risk weight (%)	Non-G10 risk weight (%)
1	1 month or less	0.00	0.00
	over 1 and up to 3 months	0.20	0.20
	over 3 and up to 6 months	0.40	0.50
	over 6 and up to 12 months	0.70	0.80
2	over 1 and up to 2 years	1.25	1.30
	over 2 and up to 3 years	1.75	1.90
	over 3 and up to 4 years	2.25	2.70
3	over 4 and up to 5 years	2.75	3.20
	over 5 and up to 7 years	3.25	4.10
	over 7 and up to 10 years	3.75	4.60
	over 10 and up to 15 years	4.50	6.00
	over 15 and up to 20 years	5.25	7.00
	over 20 years	6.00	8.00

- iii) *Vertical disallowance* – The next step in the calculation is to offset the weighted longs and shorts within each time band, resulting in a single short or long position for each band. Since

each band would include different instruments and different maturities, a 10% capital charge to reflect basis risk and gap risk will be levied on the smaller of the offsetting positions (ie the matched position), be it long or short, in each time band.

- iv) *Horizontal disallowance* – From the results of the above calculations, two sets of weighted positions, the net long or short position in each time band, would be produced. The maturity ladder is then divided into three zones defined as zero to one year, more than one year to four years and more than four years. Banking institutions will then conduct two rounds of offsetting, first between the net time band positions within each zone and secondly between the net positions across the three different zones (that is, between adjacent zones and non-adjacent zones). The residual net position in each zone may be carried over and offset against opposite positions in other zones when calculating net positions between zones 2 and 3, and 1 and 3. The offsetting will be subject to a scale of disallowances expressed as a fraction of the matched positions, as set out in Table 6 when calculating subject to a second set of disallowance factors.

**Table 6: Horizontal disallowances**

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

v) The general risk capital requirement will be the sum of:

Net Position	Net Short or Long Weighted Positions	× 100%
Vertical Disallowances	Matched Weighted Positions <sup>40</sup> in all Maturity Bands	× 10%
Horizontal Disallowances	Matched Weighted Positions within Zone 1	× 40%
	Matched Weighted Positions within Zone 2	× 30%
	Matched Weighted Positions within Zone 3	× 30%
	Matched Weighted Positions Between Zones 1 & 2	× 40%
	Matched Weighted Positions Between Zones 2 & 3	× 40%
	Matched Weighted Positions Between Zones 1 & 3	× 100%

<sup>40</sup> The smaller of the absolute value of the short and long positions within each time band.

BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 29/79
--------------------	--	--	------------

- vi) An example of the calculation of general risk is set out in **Example 3** of **Appendix 4**.

#### 11.3.5. General risk – Duration method

Under the alternative duration method, banking institutions with the necessary capability may use a more accurate method of measuring all their general risk by calculating the price sensitivity of each position separately. Banking institutions which elect to use this method must do so consistently. The mechanics of this method are as follows:

- i) Calculate the price sensitivity of each instrument in terms of a change in interest rates of between 0.8 and 1.5 percentage points for instruments denominated in non G10 countries' currencies and between 0.6 and 1.0 percentage point for instruments denominated in G10 countries' currencies (refer to Table 7) depending on the maturity of the instrument;
- ii) Slot the resulting sensitivity measures into a duration-based ladder in the thirteen time bands set out in the second column of Table 7 in and obtain the net position;
- iii) Subject long and short positions in each time band to a 5% vertical disallowance to capture basis risk in the same manner as explained above; and
- iv) Carry forward the net positions in each time band for horizontal offsetting subject to the disallowances set out in Table 6 in the same manner as explained above.
- v) The market risk capital charge will be the aggregation of the three charges described above.

**Table 7: Changes in yield for financial instruments exposed to G10 and non-G10 currency interest rate risk**

Zone	Time bands <sup>41</sup>	Time bands*	G10 Changes in yield (%)	Non-G10 Changes in yield (%)
1	1 month or less	1 month or less	1.00	1.50
	over 1 and up to 3 months	over 1 and up to 3 months	1.00	1.50
	over 3 and up to 6 months	over 3 and up to 6 months	1.00	1.40
	over 6 and up to 12 months	over 6 and up to 12 months	1.00	1.20
2	Over 1 and up to 2 years	over 12 and up to 24 months	0.90	1.00
	Over 2 and up to 3 years	over 24 and up to 36 months	0.80	0.90
	Over 3 and up to 4 years	over 36 and up to 48 months	0.75	0.90
3	Over 4 and up to 5 years	over 48 and up to 60 months	0.75	0.90
	Over 5 and up to 7 years	over 60 and up to 84 months	0.70	0.90
	over 7 and up to 10 years	over 84 and up to 120 months	0.65	0.80
	over 10 and up to 15 years	over 120 and up to 180 months	0.60	0.80
	over 15 and up to 20 years	over 180 and up to 240 months	0.60	0.80
	over 20 years	over 240 months	0.60	0.80

#### **11.4. Treatment of interest rate derivatives, repo and reverse repo transactions**

11.4.1. The measurement system should include all interest rate derivatives, off-balance sheet instruments, repos and reverse repos in the trading book which would react to changes in interest rates (eg forward rate agreements (FRAs), other forward contracts, bond futures, interest rate and cross-currency swaps and forward foreign exchange positions).

11.4.2. Derivatives should be converted into positions in the relevant underlying and subject to general risk charges. To determine the capital charge under the standard method described above, the amounts reported should be the market value of the principal

<sup>41</sup> Banking institutions have a choice of using either time bands.

<b>BNM/RH/GL 001 - 21</b>	<b>Prudential Financial Policy Department</b>	<b>Risk-Weighted Capital Adequacy Framework (Basel I)</b>	<b>Page 31/79</b>
---------------------------	---	---	-----------------------

amount of the underlying or of the notional underlying. Treatment of the interest rate derivative positions by product class is described in **Appendix 3**. A summary of the rules for dealing with interest rate derivatives is set out in Table 8.



**Table 8: Summary of treatment of interest rate derivatives, repo and reverse repos under the standard methodology**

Instrument	Specific Risk <sup>42</sup>	General risk
<b>Exchange-traded futures/OTC forwards</b>		
- Government debt security	No	Yes, as two positions <sup>+</sup>
- Corporate debt security	Yes	Yes, as two positions <sup>+</sup>
- Index on interest rates	No	Yes, as two positions <sup>+</sup>
<b>FRA's, Swaps</b>	No	Yes, as two positions <sup>+</sup>
<b>Forward foreign exchange</b>	No	Yes, as one position in each currency <sup>+</sup>
<b>Options (paragraph 14)</b>		
- Government debt security	No	Either <b>Scenario approach;</b> Carve out together with the associated hedging positions for general risk only and reflect under paragraph 14; or <b>Delta-plus method:</b> Include the delta weighted option position into the respective time bands according to its underlying. (Gamma and Vega risk should each receive a separate capital charge and calculated under paragraph 14)
- Corporate debt security	Yes	
- Index on interest rates	No	
- FRA's, Swaps	No	
<b>Repo</b>	Yes	Yes, as 4 positions <sup>+</sup>
<b>Reverse repo</b>	No	Yes, as 3 positions <sup>+</sup>

<sup>+</sup> Refer to **Appendix 3** for more details on method of recording the position

11.4.3. Interest rate and cross-currency swaps, FRA's, forward foreign exchange contracts and interest rate futures will not be subject to a specific risk charge. They are, however, subject to the credit risk provisions set out in the existing RWCR framework for counterparty credit risk. This exemption also applies to futures on an interest rate index (eg 3-month KLIBOR). In the case of contracts where the underlying is a specific debt security, or an index representing a basket of debt securities, a specific risk charge will apply.

<sup>42</sup> This refers to the specific risk charge relating to the issuer of the financial instrument. There remains a separate risk charge for counterparty credit risk under the existing capital adequacy requirements for credit risk.

BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 33/79
--------------------	--	--	------------

11.4.4. General risk applies to positions in all derivative products in the same manner as cash positions, subject only to an exemption for fully matched positions in identical instruments. The various categories of instruments should be slotted into the maturity ladder and treated according to the rules identified earlier in Table 7.

## 11.5. Treatment of Credit Derivatives

11.5.1. The capital treatment for credit derivative<sup>43</sup> instruments held in the trading book is prescribed below. The requirements for an effective risk transfer as well as the limitations to risk transfer are given in **Appendices 1 and 2** respectively.

### 11.5.2. Credit Default Swaps (CDS)

- i) The protection buyer in a CDS should report into the relevant maturity bucket a short position on the notional amount of the credit derivative contract where regular interest or fee premium are to be paid, to reflect the general risk associated with those payments. A specific risk capital charge shall also be calculated on a short position in the reference entity.
- ii) The protection seller in a CDS should report in the relevant maturity bucket a long position on the notional amount of the credit derivative contract, where regular interest or fee premium are to be received, to reflect the general risk associated with those cash flows. A specific risk capital charge shall be calculated on the long position in the reference entity.
- iii) In a CDS, each party may be exposed to the other for payment. The protection buyer must always calculate a counterparty risk charge (using the current exposure method). However, the protection seller need only calculate a counterparty risk charge if interest payments or fee premiums are outstanding.

### 11.5.3. First-to-Default Baskets (FTDB)

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<sup>43</sup> Please refer to paragraph 8 for more information on regulatory treatment for credit derivatives held in the banking book.

BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 34/79
--------------------	--	--	------------

- i) The protection buyer in a FTDB should report in the relevant maturity bucket a short position on the notional amount of the credit derivative contract, where regular interest or fee premium are to be paid, to reflect the general risk associated with those payments. A specific risk capital charge shall be calculated in only one reference entity in the basket, with that entity being chosen by the Banking institution or proportionately amongst the entities in the a green bottle structure according to the proportions in the contract.
- ii) The protection seller in a FTDB should report in the relevant maturity buckets a long position on the notional amount of the credit derivative contract, where regular interest or fee premium are to be received, to reflect general risk associated with those cash flows. A specific risk capital charge shall be calculated on the long positions in all reference entities in the basket. The amount of capital held should be capped at the maximum payout possible under the credit derivative contract.
- iii) The protection buyer should calculate a counterparty risk charge, however the protection seller need only calculate a counterparty risk charge if interest payments or fee premium are outstanding.

#### **11.5.4.Credit Linked Notes (CLN)**

- i) For the capital requirement against market risk, credit linked notes are treated as debt securities with an embedded credit exposure equivalent to the reference asset.
- ii) The protection buyer (CLN issuer) should report a short position in the note issued for general risk purposes. A specific risk capital charge shall be calculated on the short position in the reference entity.
- iii) The protection seller (CLN buyer) should report a long position in the notes for general risk purposes. In addition, the protection seller should report credit exposures to the reference entity and the CLN as a long nominal value positions

in the calculation of specific risk. No counterparty risk charges are required for transactions in CLNs.

#### **11.5.5.Total Rate of Return Swaps (TRORS)**

- i) The protection buyer in a TRORS should report in the relevant maturity buckets the following positions on the notional amount of the credit derivative contract, to reflect the general risk associated with those cash flows:
  - a. A long position on the regular interest payments received from the protection seller; and
  - b. A short position on the total returns of the reference asset, which are passed to the protection seller.
- ii) In addition, a general risk and specific risk capital charge shall be calculated on the short position in the reference obligation (if cash settled) or deliverable obligation (if physical delivery).
- iii) The protection seller in a TRORS should enter into the relevant maturity buckets the following positions on the notional amount of the credit derivative contract, to reflect the general risk associated with those cash flows:
  - a. A long position on the total returns of the reference assets received from the protection buyer; and
  - b. A short position on the agreed interest payments paid to the protection buyer.
- iv) General risk and specific risk capital charge are also calculated on the long position in the reference obligation (if cash settled) or deliverable obligation (if physical delivery). Both contract parties are exposed to a counterparty risk, which is calculated using the Current Exposure Method.

11.6. Banking institutions may only net notional positions in reference assets created by credit derivatives with positions in underlying assets or other notional positions created by other credit derivatives if these positions are equal and opposite in all respects. Where the notional positions are equal and opposite in all respects other than tenor, the specific risk capital

<b>BNM/RH/GL 001 - 21</b>	<b>Prudential Financial Policy Department</b>	<b>Risk-Weighted Capital Adequacy Framework (Basel I)</b>	<b>Page 36/79</b>
---------------------------	---	---	-----------------------

charges cannot be offset. Instead, a single specific risk charge should be calculated, based on the reference entity.

BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 37/79
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## 12. Equity Risk

- 12.1. This chapter sets out the minimum capital standard to cover the risk of equity positions in the trading book. It applies to long and short positions in all instruments that exhibit market behaviour similar to equities. The instruments covered include ordinary shares, whether voting or non-voting, convertible securities that behave like equities, and commitments to buy or sell equity securities. Non-convertible preference shares are to be excluded from these calculations as they are covered under the interest rate risk requirements described in Chapter 11. Equity derivatives and off-balance sheet positions such as futures, swaps and options on individual equity or stock indices is also included. Underwriting of equities<sup>44</sup> should be included and regarded as an option instrument.
- 12.2. The minimum capital standard for equities is expressed in terms of two separately calculated charges for the specific risk of holding a long or short position in an individual equity and for the general risk of holding a long or short position in the market as a whole. The long or short position in the market must be calculated on a market by market basis. Hence, a separate calculation has to be carried out for each national market in which the banking institution holds equities.

### 12.3. Specific Risk

12.3.1. Specific risk is defined as a proportion of the banking institution's sum of the absolute value of all net positions in each individual equity<sup>45</sup> regardless of whether it is net long or net short. Matching opposite position for the same equity issuer may be netted-off. The charge for specific risk is listed in Table 9<sup>46</sup>.

<sup>44</sup> The underwriter is obliged to purchase equities at the issue price for unsubscribed equities which in effect is equivalent to writing a put option where the issuer has the right but not the obligation to sell the equities to the underwriter at the issue price.

<sup>45</sup> Net position in each individual equity refers to the net of short and long exposure to an individual company.

<sup>46</sup> If the Delta-plus method or the Scenario approach is selected to estimate the general risk of

## 12.4. General Risk

12.4.1. General risk will be assessed on the difference between the sum of the longs and the sum of the shorts of all equity positions (ie. the overall net position) in an equity market. The general risk charge is as provided in Table 9.

**Table 9: Specific risk and General risk charges for equities and equity derivatives**

Instrument	Specific risk	General risk
<b>Equity and/or equity derivative (except options) positions with the following as underlying:</b>		
KLSE CI equities & Trust funds	8%	8%
Equities of G10 countries market indices	4%	8%
Equities of G10 stock exchanges	8%	8%
All other equities	14%	8%
KLSE CI index	2%	8%
G10 countries market indices	2%	8%
Other market indices	2%	8%
<p><b>Equity options including underwriting of equity IPO:</b>  <i>either</i>  <b>Underlying position approach;</b>            General and specific risk<sup>47</sup> for underwriting IPO and rights issue is calculated by carving out the positions and reflected in Chapter 14 (Treatment of Options);  <b>Scenario approach:</b></p> <ul style="list-style-type: none"> <li>• Specific risk is calculated by multiplying the delta weighted position by the specific risk charge as provided under the equity derivatives category.</li> <li>• General risk is calculated by carving out the options position together with its associated hedging positions and reflected in Chapter 14; <b>or</b></li> </ul> <p><b>Delta-plus method:</b></p> <ul style="list-style-type: none"> <li>• For both specific risk and general risk charge, the delta weighted option position is multiplied with the relevant specific risk and general risk charge as provided under the equity derivatives category.</li> <li>• Gamma and Vega risk should each receive a separate capital charge calculated as per in Chapter 14</li> </ul>		

equity options, the specific risk of these positions will be calculated within this part as the multiplication of the delta weighted option underlying position and the risk weight for specific risk as provided in Table 9. However, if the Underlying Position approach is adopted, both specific risk and general risk of the equity option will be carved out and provided under Chapter 14 (Treatment of Options).

<sup>47</sup> The choice is available only to merchant banks which currently underwrites equity IPO and rights

<b>BNM/RH/GL 001 - 21</b>	<b>Prudential Financial Policy Department</b>	<b>Risk-Weighted Capital Adequacy Framework (Basel I)</b>	<b>Page 39/79</b>
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issue on a stand alone basis.



BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 40/79
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## 12.5. Treatment of Equity Derivatives

12.5.1. Equity derivatives and off-balance sheet positions which are affected by changes in equity and equity index prices should be included in the measurement system. The equity derivatives are to be converted into positions in the relevant underlying as follows:

- i) futures and forward contracts relating to individual equities should be reported at current market prices;
- ii) futures relating to equity indices should be reported at the market value of the notional underlying equity portfolio;
- iii) equity swaps are to be treated as two notional positions<sup>48</sup>; and
- iv) equity options and stock index options should be treated under one of the three proposed methods in Chapter 14 (Treatment of Options).

- **Underlying Position Method** – underwriting of equity IPO position is carved out where capital charge for **both specific risk and general risk** are provided as described in paragraph 14.5 (applicable as a choice only for merchant banks which are exposed to underwriting IPO and rights issue form of option risk)
- **Scenario Approach** – options position and its relevant underlying position are carved out where capital charge for **general risk** is provided as described in paragraph 14.7. Capital charge for **specific risk** is calculated under this chapter where the **delta weighted position** of the option's underlying is multiplied with the risk weight as described in Table 9.
- **Delta-plus Method** – capital charge will be provided for

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<sup>48</sup> For example, an equity swap in which a banking institution is receiving an amount based on the change in value of one particular equity or stock index and paying a different index will be treated as a long position in the former and a short position in the latter. Where one of the legs involves receiving/paying a fixed or floating interest rate, that exposure should be slotted into the appropriate repricing time band for interest rate related instruments as set out in Chapter 11 on (Interest Rate Risk). The stock index should be covered by the equity treatment.

BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 41/79
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**the delta weighted position** of the equity option **for both specific risk and general risk** under this chapter according to the risk weights as provided in Table 9. Nevertheless, capital charge for Gamma risk and Vega risk will be provided separately as described in paragraph 14.6.

The treatment of equity derivatives is summarised in Table 9.

12.5.2. Matching equity derivative positions with identical equity or equity index underlying in each market may be fully offset, resulting in a single net short or long position to which the specific and general risk charges will apply. For example, a future in a given equity may be offset against an opposite physical position in the same equity<sup>49</sup>

12.5.3. Where a banking institution engages in a deliberate arbitrage strategy, in which a futures contract on a broadly-based index matches a basket of equities, it may decompose the equity index position into notional positions in each of the constituent equities and include these notional positions and the disaggregated physical basket in the respective equity market portfolio, netting the physical positions against the index equivalent positions in each equity. Banking institutions shall consult the Bank if such treatment is intended to be used.

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<sup>49</sup> The interest rate risk arising out of the futures contract, however, should be reported as set out in Chapter 11.

BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 42/79
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### 13. Foreign Exchange Risk (including gold positions)

13.1. This chapter sets out the minimum capital standard to cover the risk of holding or taking positions in foreign currencies including gold. Taking on foreign exchange positions may also expose a banking institution to interest rate risk (for example, in forward foreign exchange contracts). In such a case, the relevant interest rate positions should be included in the calculation of interest rate risk described in Chapter 11.

13.2. Two processes are needed to calculate the capital requirement for foreign exchange risk. The first is to measure the exposure in a single currency position. The second is to measure the risks inherent in a banking institution's mix of net long and short positions in different currencies. The capital charge will be 8 per cent of the higher of the total net long or total net short foreign currency position. Net position in gold will be treated on a stand alone basis and applied a capital charge of 8%.

#### 13.3. Measuring the exposure in a single currency

- i) The banking institution's net open position in each currency (excluding gold) should be calculated by aggregating the following positions:
- ii) The net on-balance sheet position (ie all foreign currency asset items less all foreign currency liability items, eg. currency and notes, trade bills, government and private debt papers, loans and deposits, foreign currency accounts and accrued interest, denominated in the foreign currency in question)<sup>50</sup>;
- iii) The net forward position (ie present value of all amounts to be received less present value of all amounts to be paid under unsettled spot transactions, forward foreign exchange transactions, including currency futures, the principal on currency swaps position and

<sup>50</sup> Interest and other income accrued (ie earned but not yet received) should be included as a position. Accrued expenses should also be included.

BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 43/79
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interest rate transactions such as futures, swaps etc denominated in a foreign currency)<sup>51</sup>;

- iv) Guarantees and contingencies (exclude underwriting of equity IPOs which are captured as options and treated in Chapter 14 (Treatment of Options) that are certain to be called and are likely to be irrecoverable;
- v) Any other item representing a profit or loss in foreign currencies; and
- vi) The net delta-based equivalent of the total book of foreign currency options<sup>52</sup>.

13.4. Currency pairs subject to a binding inter-governmental agreement linking the two currencies, may be treated as one currency<sup>53</sup>.

13.5. Positions in gold should be measured in terms of the standard unit of measurement which is then converted at reporting date spot exchange rate into Ringgit<sup>54</sup>.

### **13.6. Measuring the foreign exchange risk in a portfolio of foreign currency positions)**

13.6.1. Under the standard method, the net position of the combined trading and banking book in each foreign currency is converted at spot rates (as at date of reporting) into the reporting currency (Malaysian Ringgit). The overall net open position is measured by aggregating:

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<sup>51</sup> Forward currency positions could be valued in the following ways:

- i. Present values of each forward foreign currency position using the interest rate of the foreign currency and translated at current spot exchange rates to get the Ringgit equivalent;
- ii. Use forward exchange rates to translate the forward foreign currency leg into Ringgit equivalent before discounting it by Ringgit interest rates; or
- iii. Multiply the foreign currency forward leg by current spot exchange rate without present valuing.

Treatments (i) and (ii) are preferred. Nevertheless, treatment (iii) which is a simplified but relatively inaccurate method may be used by banking institutions with small foreign exchange positions and do not possess the systems to conduct present value calculations.

<sup>52</sup> Applicable to institutions which uses the Delta-plus method of treating options position. Subject to separately calculated capital charges for Gamma and Vega as described in Chapter 14; alternatively, options and their associated underlying may be subject to one of the other methods described in the Chapter 14.

<sup>53</sup> For example, inter-governmental agreements apply to Singapore and Brunei dollars.

<sup>54</sup> Where gold is part of a forward contract (the quantity of gold to be received or to be delivered), any interest rate or foreign currency exposure from the other leg of the contract should be reported as set in Chapter 11.

<b>BNM/RH/GL 001 - 21</b>	<b>Prudential Financial Policy Department</b>	<b>Risk-Weighted Capital Adequacy Framework (Basel I)</b>	<b>Page 44/79</b>
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- i) the sum of the net short positions or the sum of the net long positions, whichever is the greater; with
- ii) the net position (short or long) in gold, regardless of whether it is positive or negative.

The capital charge will be 8% of the overall net open position.

BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 45/79
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## 14. Treatment of Options

14.1. In recognition of the diversity in banking institutions' activities in options, three approaches are provided for measuring options related risks :

- i) *Underlying Position approach* – banking institutions whose options risk is derived from underwriting of equity initial public offers (IPO), rights issue and debt securities, may use the Underlying Position approach to estimate the capital charge;
- ii) *Delta-plus method or Scenario approach* – banking institutions which offer options products beyond pure underwriting of equity IPO, rights issue or debt securities, are expected to use either the Delta-plus method or Scenario approach.

Banking institutions are expected to choose only one approach. A combination of approaches is not allowed.

14.2. In the underlying position approach, the positions created from equity and debt underwriting are "carved-out" and subject to separately calculated capital charges that incorporate both specific risk and general risk. The capital charge numbers are then added to the capital charges of the other risk categories.

14.3. The delta-plus method uses the sensitivity parameters or "Greek letters" associated with options to measure their market risk and capital requirements. Under this method, the delta-equivalent position of each option becomes part of the standard methodology set out in Chapters 11 to 14 with the delta-equivalent amount subject to the applicable general risk charges (to capture delta risk). Separate capital charges are then applied to capture Gamma and Vega risks of the option positions which are specifically addressed in paragraphs 14.6. For equity options, the specific risk charge is calculated and captured together with other equities position under Chapter 13 based on the delta-weighted option underlying position multiplied by the specific risk weight provided in Table 9 in Chapter 12.

<b>BNM/RH/GL 001 - 21</b>	<b>Prudential Financial Policy Department</b>	<b>Risk-Weighted Capital Adequacy Framework (Basel I)</b>	<b>Page 46/79</b>
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14.4. The scenario approach uses simulation techniques to calculate changes in the value of an options portfolio for changes in the level and volatility of the prices/rates of its associated underlying. The options portfolio position and its underlying (if any) are “carved out”. Capital charges for general risk are separately calculated based on the scenario "matrix" (ie. the specified combination of underlying and volatility changes) that produces the largest loss. In the case of equity options, the specific risk charge is calculated and captured under Chapter 12 based on the delta-weighted option underlying position multiplied by the specific risk weight provided in Table 9 in Chapter 12.

## 14.5. Underlying Position approach

14.5.1. Banking institutions whose option risk is from underwriting of equity IPO, rights issues and debt securities, may use the underlying position approach to estimate the required capital charge for these transactions on a trade-by-trade basis, as described below:

### Underlying Position approach: capital charges

Position	Treatment
Underwriting of equity type instrument; IPO and rights issue	The capital charge will be the amount of equity in the underwriting agreement which the banking institution is <b>committed</b> to underwrite multiplied by the sum of specific risk and general risk weights as defined in Table 9 in Chapter 12. The resultant amount is then multiplied by 50%, the conversion factor which estimates the pick-up probability. The recognition period for the underwriting equity risk begins from the date when the underwriting agreement is signed until the date of issuance. Equity positions held post-issuance date would be treated as per equity risk in Chapter 12.
Underwriting of debt instruments	The amount of debt to be raised in the underwriting agreement in which the banking institution is <b>committed</b> to underwrite <sup>55</sup> , multiplied by 50%, the conversion factor which estimates the pick-up probability. The resultant figure will be incorporated into Chapter 11 to calculate the capital charge for general risk. For specific risk charge, the same resultant figure is multiplied by the specific risk charge stipulated in Table 4 in Chapter 11. The recognition period for the underwriting of debt instruments begins from the date when the underwriting agreement is signed until the date of issuance <sup>56</sup> . Debt positions held post-issuance date would be treated as per interest rate risk described in Chapter 11.

<sup>55</sup> Underwriting commitments can be netted off against sell down (back-to-back) arrangements established with unrelated parties, where the arrangement is unconditional, legally binding and irrevocable, and where the banking institution has no residual obligation to pick up the purported sell down portion.

<sup>56</sup> In most cases of underwriting of **short-term debt** such as commercial papers, given that the rate guaranteed is usually based on cost of funds plus a spread, where the cost of funds is determined one or two days before issuance, the real exposure to the institutions arising from the underwriting agreement is more of the credit risk of the issuer rather than an interest rate fluctuation risk. As such, for specific risk, the recognition period for underwriting of commercial papers/short term debts papers begins from the date when the underwriting agreement is signed until the date of issuance whilst for general risk, the recognition period for underwriting of commercial papers/short term debts begins from the date a rate is fixed until the date of issuance. In the event that market practice changes or in the case of underwriting of debt instruments which assumes characteristics of interest rate options, these positions should be reflected accordingly.



BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 48/79
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## 14.6. Delta-plus method

14.6.1. Banking institutions which write options may be allowed to include delta-weighted option positions within the standard method set out in Chapter 11. Such options should be reported 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. However, since delta does not cover all risks associated with option positions, banking institutions are also required to 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.

14.6.2. Delta-weighted positions with debt securities or interest rates as the underlying will be slotted into the interest rate time bands, as set out in Chapter 11, under the following procedure. Similar to other derivative transactions, a two-legged approach should be used, which requires one entry at the time the underlying contract takes effect and a second entry, at the time the underlying contract matures. For instance, a bought call option on a June three month interest rate future will in April be considered, on the basis of its delta-equivalent value, to be a long position with a maturity of five months and a short position with a maturity of two months<sup>57</sup>. The written option will be similarly slotted as a long position with a maturity of two months and a short position with a maturity of five months. Floating-rate instruments with caps or floors will be treated as a combination of floating-rate securities and a series of European-style options. For example, the holder of a three-year floating-rate bond indexed to 6-month KLIBOR with a cap of 15 per cent will be treated as:

- i) a debt security that reprices in six months; and
- ii) a series of five written call options on a FRA with a reference

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<sup>57</sup> A two month call option on a bond future where delivery of the bond takes place in September would be considered in April as being a long position in the bond and a short position in the five months deposit, both positions being delta-weighted.

rate of 15 per cent, each with a negative sign at the time the underlying FRA takes effect and a positive sign at the time the underlying FRA matures.

14.6.3. The capital charge for options with equities as the underlying will also be based on the delta-weighted positions which will be incorporated in the measure of market risk described in the Chapter 12.

14.6.4. The capital charge for options on foreign exchange will be based on the delta-weighted position which will be incorporated into the measurement of the exposure for the respective currency position as described in Chapter 13.

14.6.5. In addition to the above capital charge arising from delta risk, there will be further capital charges for Gamma and for Vega risk. Banking institutions using the delta-plus method will be required to calculate the Gamma and Vega for each option position separately.

14.6.6. The capital charges for Gamma risk should be calculated in the following way:

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

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

- i) for interest rate options, the market value of the underlying should be multiplied by the risk weights set out in Table 5 of Chapter 11;
- ii) for options on equities and equity indices, the market value of the underlying should be multiplied by the equity general risk charge set out in Chapter 12; and
- iii) for options on foreign exchange, the market value of the underlying multiplied by 8 per cent.

14.6.7. For the purpose of calculating the Gamma impact the following should be treated as the same underlying:

BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 50/79
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- iv) for interest rates<sup>58</sup>, each time band as set out in Table 5 of Chapter 11;
- v) for equities and stock indices, each national market; and
- vi) for foreign currencies, each currency pair.

14.6.8. Each option on the same underlying will have a Gamma impact that is either positive or negative. These individual Gamma impacts will be summed, resulting in a net Gamma impact for each underlying which is either positive or negative. Only net Gamma impacts that are negative will be included in the capital calculation.

14.6.9. The total Gamma capital charge will be the sum of the absolute value of the net negative Gamma impacts as calculated above.

14.6.10. To calculate Vega risk, banking institutions must multiply the Vega for each option by a 25 per cent proportional shift of the option's current volatility. The results are then 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. An illustration of the use of the Delta-plus method is provided in **Example 4** in **Appendix 4**.

## 14.7. Scenario approach

14.7.1. Banking institutions will also have the right to base the market risk capital charge for options portfolios and associated hedging positions using the scenario matrix analysis. This will be accomplished by specifying a fixed range of changes in the option portfolio's risk factors (i.e. underlying price/rate and volatility) and calculating changes in the value of the option portfolio and its associated hedging positions at various points along this matrix. To calculate the capital charge, the banking institution has to revalue the option portfolio using matrices for simultaneous changes in the option's underlying rate or price and in the volatility of that rate or price. A different matrix will be set up for each individual underlying

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<sup>58</sup> Positions have to be slotted into separate maturity ladders by currency.

BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 51/79
--------------------	--	--	------------

as defined in paragraph 14.3. In the case of interest rate options, an alternative method is permitted for banking institutions to base the calculation on a minimum of six sets of time bands. When using this method, not more than three of the time bands (as defined in Table 7, in Chapter 11) should be combined into any one set.

14.7.2. The options and related hedging positions will be evaluated over a specified range above and below the current value of the underlying – this defines the first dimension of the matrix. The range for changes in interest rates is consistent with the assumed changes in yield in Table 7 in Chapter 11. Banking institutions using the alternative method for interest rate options set out in the previous paragraph should use, for each set of the time bands, the highest of the assumed changes in yield, applicable to the group to which the time bands belong<sup>59</sup>. The other ranges are the equity general risk charge stipulated in Table 9 for equities, and  $\pm 8$  per cent for foreign exchange and gold. For all risk categories, at least seven price shifts (including the current observation) should be used to divide the range into equally spaced intervals.

14.7.3. The second dimension of the matrix entails a change in the volatility of the underlying rate or price. A single change in the volatility of the underlying rate or price equal to a proportional shift in volatility of  $\pm 25$  per cent is expected to be sufficient in most cases. As circumstances warrant, however, the Bank may require that a different change in volatility be used and/or that intermediate points on the matrix be calculated.

14.7.4. After calculating the matrix, each cell should contain the net profit or loss of the option and the underlying hedge instrument. The capital charge for each underlying will then be calculated as the largest loss contained in the matrix.

14.7.5. The application of the scenario method by any specific banking

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<sup>59</sup> If, for example, in the case of options involving G10 currency interest rate risk, where the time-bands 3 to 4 years, 4 to 5 years and 5 to 7 years are combined, the highest assumed change in yield of these three bands would be 0.75 percentage point.

<b>BNM/RH/GL 001 - 21</b>	<b>Prudential Financial Policy Department</b>	<b>Risk-Weighted Capital Adequacy Framework (Basel I)</b>	<b>Page 52/79</b>
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institution will be subject to supervisory consent, particularly with regard to the precise way that the analysis is constructed. An illustration of the use of the scenario approach is provided in **Example 5** in **Appendix 4**.

## PART D LARGE EXPOSURE RISK REQUIREMENTS

### 15. LERR for banking institutions

- 15.1. A banking institution shall compute its' Large Exposure Risk Requirement (LERR) in relation to its exposure of holding equities.
- 15.2. The LERR for a single equity capital charge will be imposed on an ongoing basis if an exposure to a single equity is greater than either the lower of 15% of the banking institution's capital base or 10% of the issuer's paid-up capital. For equity positions held in the trading book, the capital charge is determined by multiplying the market value of the equity position in excess of the threshold, with the sum of the corresponding general and specific risk weights outlined in the MRCAF. For positions held in the banking book, the capital charge is determined by multiplying the value in excess of the threshold with the corresponding risk weight (i.e. 100%). For trading book exposures, the LERR capital charge shall be multiplied by a factor of 12.5 to arrive at a risk-weighted asset equivalent. An illustration for the calculation of LERR is given in **Example 6** in **Appendix 4**.
- 15.3. Shares and interest-in-shares that are acquired as a result of underwriting commitments, debt satisfaction and debt-equity conversions<sup>60</sup> may be excluded from the LERR capital charge if the shares and interest-in-shares are disposed within 12 months from the date of acquisition. However, banking institutions shall be subject to the LERR capital charge if the shares and interest-in-shares remain with the banking institution upon expiry of the 12 months period.

### 16. LERR for investment banks

- 16.1. For an investment bank, the exposure to a single equity<sup>60</sup> shall be computed by including the market value of the equity from the following

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<sup>60</sup> Shall also include an equity OTC option or equity warrant that is in the money at its full underlying value.

BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 54/79
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positions:

- i) The investment banks' own proprietary equity positions; and
- ii) Net purchase contract value of single equity underlying clients' accounts arising from transactions either under a Ready or Immediate Basis Contract, to the extent that it has not been paid for on and subsequent to the due settlement date.

16.2. Therefore, in addition to the requirement in Chapter 15, LERR shall also be computed in relation to an investment bank's exposure to a single counterparty<sup>61</sup> arising from unsettled trades and free deliveries in the normal course of trading in equity securities that are greater than 10% of the investment bank's capital base. The LERR capital charge is equivalent to the corresponding counterparty risk requirement (CRR) calculated as per Chapter 5.

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<sup>61</sup> A single counterparty includes:

- i. Where a counterparty is an individual, the individual, spouse of the individual, the partnership of which he is a partner, any partner of the individual, the spouse of the partner and all companies/corporations which the individual exercise control. For purposes of this framework, an individual is deemed to exercise 'control' over a company/corporation if the individual or the individual's spouse, severally or jointly:
  - Holds, directly or indirectly, more than 50% of the shares of the corporation,
  - Has the power to appoint, or cause to be appointed, a majority of the directors of the company or corporation, or
  - Has the power to make, cause to be made, decisions in respect of the business or administration of the company or corporation, and to give effect to such decisions, or cause them to be given effect to.
- ii. Where a counterparty is a company or corporation, the company or corporation, its related company or corporation and its associated companies.

# APPENDICES

## Appendix 1

### Credit derivatives – requirements for effective risk transfer

1. For capital adequacy purposes, banking institutions will only be regarded as having purchased protection if the credit risk of the reference asset has been transferred to the protection seller. Where banking institutions have sold protection using a credit derivative, it should be assumed that 100 per cent of the credit risk is purchased irrespective of the range of credit events specified. The following are conditions for regulatory recognition of credit derivatives as risk mitigants, offered or transacted by banking institutions:
  - i) Credit protection is legally binding, irrevocable & unconditional;
  - ii) Explicitly referenced to specific exposures and pool of exposures;
  - iii) Direct and non-contingent claim on protection seller;
  - iv) Credit risk transfer must not violate the terms and conditions relating to the reference asset;
  - v) Identity of party who decides credit event has occurred clearly defined;
  - vi) Cash settlement option is subject to robust valuation methods and processes;
  - vii) The right or ability to transfer the deliverable obligation is not impeded under the physical settlement option;
  - viii) For unfunded protection, the protection seller and the reference entity should be entities that do not belong to the same group; and
  - ix) Absence of any type of mismatch between the underlying credit risk and the credit protection.
  
2. In certain credit derivative transactions, it is difficult to achieve an effective hedge, as prescribed under condition (ix), due to the existence of mismatches and materiality thresholds. Hence, suitable adjustments shall be made to the extent of credit protection recognisable on account of such mismatches or thresholds, in accordance with **Appendix 2** on Limitations to Risk Transfer.



## Appendix 2

### Credit derivatives – limitations to risk transfer

#### *Asset Mismatch*

1. Asset mismatch<sup>62</sup> will arise if the underlying asset is different from the reference obligation (in case of cash settlement) or deliverable obligation (in case of physical settlement).
2. Where a banking institution has purchased protection using a credit derivative and the reference obligation, or deliverable obligation, is different from the underlying asset, the amount of protection provided by the credit derivative may not be sufficient to constitute an effective hedge.
3. Credit derivative transaction requiring physical settlement - if the underlying asset is a deliverable obligation under the terms of the credit derivative contract, the banking institution will be regarded as having purchased protection only if the credit event payment fully compensates any potential loss in the underlying asset. Where this is not the case, the rules relating to credit derivatives requiring cash settlement below, will apply.
4. Credit derivative transaction requiring cash settlement - a banking institution may recognise the protection acquired as an effective hedge if the following criteria are met:
  - i) the underlying asset and the reference obligation are obligations of the same reference entity or the underlying asset is an obligation of an entity that is unconditionally and irrevocably guaranteed by the reference entity to the credit derivative contract;
  - ii) the underlying asset is an obligation under the terms of the credit derivative contract; and
  - iii) the reference obligation is ranked pari passu or lower, in seniority of claim, relative to the underlying asset.

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<sup>62</sup> For example, a credit derivative referenced to the credit quality of a corporate bond (i.e. the reference asset) may be used to offset the credit exposure on a loan (i.e. the underlying asset) to the same obligor. In such cases, the protection available to the protection buyer may be lost or diminished if the underlying asset defaults without a corresponding credit event in the reference asset, or if the post default residual value of the reference asset is higher than that of the underlying asset.

BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 57/79
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### ***Maturity Mismatch***

5. Where a banking institution has purchased protection using a credit derivative and the maturity of the credit derivative contract is less than the maturity of the reference asset, the amount of protection that is recognised for capital adequacy purposes must be reduced. The amount of this reduction depends on the residual maturity of the credit derivative relative to the residual maturity of the underlying exposure.
6. For example, in the case of a 10-year exposure hedged by a credit derivative with a residual maturity of 9 years, 90% of the exposure may be risk-weighted on the basis of the protection seller, with the remaining 10% risk weighted on the basis of the underlying exposure.
7. At the minimum, the credit derivative would need to have a residual maturity of at least one year to apply this treatment, failing which, the positions are considered as unhedged.
8. Where a banking institution has sold protection using a credit derivative, the tenor of the exposure to be reported shall be the remaining tenor of the credit derivative contract.

### ***Currency Mismatch***

9. Where the credit derivative is denominated in a different currency from the reference asset, the amount of credit protection recognised is reduced by 8% to take account of the contingent foreign currency risk.
10. The 8%, which reflects the potential fluctuation in the value of protection, is currently used for calculating capital charges of foreign exchange risk (standardised approach) under the market risk regime.
11. Since the protection will vary with currency movements, the foreign currency positions of credit derivatives should be revalued at least monthly.
12. The Bank may consider waiving the 8% discount factor where:
  - i) A banking institution can demonstrate that it has hedged the contingent foreign currency risk; or
  - ii) The foreign currency positions of credit derivatives are revalued daily and protection is recognised only to the extent of the revalued

BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 58/79
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amount. Foreign currency positions created by credit derivatives should also be recorded when measuring the capital requirement for the banking institution's market risk exposure.

13. For a banking institution that acts as an intermediary for credit derivatives, complete offsetting of the credit risk is allowed if the long and short positions are back-to-back and identical in all respects. However, the banking institution is still required to hold capital against the counterparty acting as the Protection Seller, according to the latter's risk weight.

### ***Materiality Threshold***

14. The size and nature of any materiality thresholds specified in the credit derivative contract may also reduce the amount of credit risk transferred from the protection buyer to the protection seller. Materiality thresholds require a given level of loss to occur before the credit derivative is triggered. If these thresholds are set too high, it is possible that a significant loss could be incurred on the reference asset without a credit event payment being made. In these cases, the degree of risk transfer is significantly limited. Consequently, the products are ineligible for guarantee treatment by the protection seller and the protection buyer would be required to continue to hold capital against the reference asset, i.e. the protection buyer cannot reduce the risk weight of the reference asset to that of the protection seller.
15. When determining the amount of protection sold by the credit derivative, the protection seller should assume that any materiality thresholds written into the credit derivative contract do not reduce the acquired credit risk.

## Appendix 3

### Treatment of the interest rate derivative positions by product class

#### *Futures and forward contracts, including forward rate agreements*

1. These instruments (with the exception of futures or forwards on corporate bonds, corporate bond indices or other corporate securities) are treated as a combination of a long and a short position in a notional government security. The maturity period of futures or FRAs will be the period until delivery or exercise of the contract, plus – where applicable – the life of the underlying instrument. For example, a long position in a June three month interest rate future (taken in April) is to be regarded as a long position in a government security with a maturity of five months and a short position in a government security with a maturity of two months.
2. In the case of a future or forward on a corporate bond or corporate bond index, positions will be included at the market value of the notional underlying security/portfolio of securities. In the case of foreign currency forward contracts, either a long or a short position in the market value of each underlying currency leg would be recorded in the respective maturity ladder templates capturing the relevant currency interest rate risk.

#### *Swaps*

3. Swaps will be treated as two underlying positions in government securities with relevant maturities. For example, an interest rate swap under which a reporting institution is receiving floating-rate interest and paying fixed will be treated as a long position in a floating-rate instrument of maturity equivalent to the period until the next interest fixing and a short position in a fixed-rate instrument of maturity equivalent to the residual life of the swap.
4. For swaps that pay or receive a fixed or floating interest rate against some other reference price, eg a stock index, the interest rate component should be slotted into the appropriate repricing maturity category, with the equity component being included in the equity framework. The separate legs of cross-currency swaps are to be reported at market value in the relevant maturity ladders for the currencies concerned.

BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 60/79
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### ***Sell and Buy-Back Repurchase Agreements (Repo)***

5. When a bank holds a trading book security and enters into a repo agreement to sell the underlying trading book security:
  - i) The first leg of the repo agreement is treated as an offsetting short position to the long position in the underlying security based on the market value and remaining maturity of the underlying security.
  - ii) The second leg of the repo should reflect the forward purchase of the underlying security. This is recorded as:
    - a long position on the market value and remaining maturity of the underlying security; and
    - a short position in the market value of the underlying security and the remaining maturity of the repo agreement.
  
6. When a bank enters into a reverse repo agreement to buy the underlying trading book security:
  - i) The first leg of the reverse repo agreement is treated as a long position in the underlying security, where the position is recorded by the market value and remaining maturity of the underlying security.
  - ii) The second leg of the repo agreement should reflect the forward sale of the underlying security. This is recorded as
  - iii) The second leg of the repo should reflect the forward purchase of the underlying security. This is recorded as:
    - a short position on the market value and remaining maturity of the underlying security; and
    - a long position in the market value of the underlying security and the remaining maturity of the repo agreement.

### ***Options***

Two methods (Scenario Approach and Delta-Plus Method) are available under Chapter 14. on the treatment of interest rate related options. Interest rate option positions and their underlying transactions will be carved out and capital provided separately for general risk if reporting institutions choose to use the scenario approach. However, if the delta-plus method is selected, the delta-weighted option

<b>BNM/RH/GL 001 - 21</b>	<b>Prudential Financial Policy Department</b>	<b>Risk-Weighted Capital Adequacy Framework (Basel I)</b>	<b>Page 61/79</b>
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position will be slotted into the respective time bands according to its underlying together with the other interest rate related instruments. Nevertheless, under the delta-plus method, the Gamma and Vega Risks will be separately calculated as described in paragraph 14.6.

## Appendix 4 Examples and illustrations

### *Example 1 – Computation of risk-weighted capital requirement for a portfolio of derivative contracts*

#### Transaction I

Type of instrument	:	8 Year Fixed-to-floating Cross Currency Interest Rate Swap (CCIRS)
Notional principal amount	:	RM1,000,000
Current date of report	:	31 December 1997
Maturity date	:	31 December 2000
Remaining maturity	:	3 years
Replacement cost	:	RM350,000 (+ve)

#### Transaction II

Type of instrument	:	6 Year Fixed-to-floating Interest Rate Swap (IRS)
Notional principal amount	:	RM1,000,000
Current date of report	:	31 December 1997
Maturity date	:	31 December 2002
Remaining maturity	:	5 years
Replacement cost	:	RM200,000 (-ve)

Type of instrument	CCIRS	IRS	Total
Credit equivalent exposure = positive replacement cost + potential future exposure	$350,000 + \{1,000,000 \times (2\% + 7\%)\}$ $= 350,000 + 90,000$ $= 440,000$	$0 + \{1,000,000 \times (4\%)\}$ $= 0 + 40,000$ $= 40,000$	480,000
Risk-weighted asset (assume risk-weight of 50%)	$440,000 \times 50\%$ $= 220,000$	$40,000 \times 50\%$ $= 20,000$	240,000
Capital requirement (8%)	$220,000 \times 8\%$ $= 17,600$	$20,000 \times 8\%$ $= 1,600$	19,200





BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 64/79
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**Example 3 – Calculation of general risk (maturity method) for interest rate related financial instruments**

1. Assume that a banking institution has the following positions in its trading book:
  - i) a Malaysian fixed rate private debt securities (PDS), RM13.33 million market value, residual maturity 8 years;
  - ii) a Malaysian government securities (MGS), RM75 million market value, residual maturity 2 months;
  - iii) an interest rate swap, RM150 million<sup>63</sup>, the banking institution receives floating rate interest and pays fixed, the next interest fixing occurs after 9 months, residual life of the swap 8 years;
  - iv) a long position in MGS futures of RM60 million<sup>64</sup>, maturing in six months time, life of underlying government security 3.5 years; and
  - v) a Malaysian fixed rate PDS, RM50 million market value, residual maturity of 5 years, sold under repo for three months.
2. Table A shows how these positions are slotted into the time bands and are weighted according to the weights given in column 4 of Table 5 (Risk weight for Non-G10 countries currency) of Chapter 11. After weighting the positions, the calculation should proceed as follows:
  - i) The overall net position is -2.12 million (0.05-0.30+1.20+1.62+1.60-6.29 million) leading to a capital charge of **RM2.12 million**.
  - ii) The *vertical disallowance* in time bands 1-3 months, 4-5 years and 7-10 years has to be calculated and the matched position in these time-bands (the lesser of the absolute values of the added weighted long and added weighted short positions in the same time-band) are 0.10, 1.60 and 0.61 million respectively resulting in a capital charge of 10% of 2.31 million = **RM0.23 million**.

<sup>63</sup> The position should be reported as the market value of the notional underlying. Depending on the current interest rate, the market value of each leg of the swap (i.e. the 8 year bond and the 9 month floater) can be either higher or lower than the notional amount. For simplicity, the example assumes that the current interest rate is identical with the one the swap is based on, hence, the market value for both legs are identical.

<sup>64</sup> Similar to interest rate swaps, the market value of each leg should be used.

- iii) The *horizontal disallowances within the zones* have to be calculated. As there are more than one position in zones 1 and 3, a horizontal disallowance need only be calculated in these zones. In doing this, the matched position is calculated as the lesser of the absolute values of the added long and short positions in the same zone and is 0.30 and 1.60 million in zones 1 and 3 respectively. The capital charge for the horizontal disallowance within zone 1 is 40% of 0.30 million = **0.12 million** and 30% of 1.60 million = **0.48 million** in zone 3. The remaining net weighted positions in zones 1 and 3 are +0.95 and -4.69 million respectively.
- iv) The *horizontal disallowances between adjacent zones* have to be calculated. After calculating the net position within each zones the following positions remain: zone 1: +0.95 million; zone 2: +1.62 million and zone 3: -4.69 million. The matched position between zones 2 and 3 is 1.62 million (the lesser of the absolute values of the long and short positions between adjacent zones). The capital charge in this case is 40% of 1.62 million = **RM0.65 million**.
- v) The *horizontal disallowance between zones 1 and 3* has to be calculated. The matched position between zones 1 and 3 is 0.95 million (the lesser of the absolute values of the long and short positions between zones 1 and 3). The horizontal disallowance between the two zones is 100% of the lower of the matched position which leads to a capital charge of 100% of 0.95 million = **RM0.95 million**.

3. The total capital charge (RM million) in this example is:

- for the overall net open position	2.12
-for the vertical disallowance	0.23
- for the horizontal disallowance in zone 1	0.12
- for the horizontal disallowance in zone 3	0.48
- for the horizontal disallowance between adjacent zones	0.65
- for the horizontal disallowance between zones 1 and 3	0.95
<b>Total</b>	<b>RM4.55 million</b>

**Table A: Maturity Method of calculating General Risk of  
Interest Rate Related Financial Instruments (RM million)**

	Zone 1 (mths)				Zone 2 (years)			Zone 3 (years)					
Time-band	0-1	1-3	3-6	6-12	1-2	2-3	3-4	4-5	5-7	7-10	10-15	15-20	Over 20
	Months				Years								
<b>Positions</b>													
<b>Long</b>		75 Govt Bond (ii)		150 Swap (iii)			60 Fut. (iv)	50 PDS (v) 50 Forw. Purch (v)		13.33 PDS (i)			
<b>Short</b>		50 Forw. Purch (v)	60 Fut. (iv)					50 Offset (v)		150 Swap (iii)			
<b>Weight (%)</b>	0.00	0.20	0.50	0.80	1.30	1.90	2.70	3.20	4.10	4.60	6.00	7.00	8.00
<b>Position x Weight</b>		+0.05	-0.30	+1.20			+1.62	+1.60		-6.29			
<b>Vertical Disallow.</b>										2.31 x 10% = 0.23			
<b>Horizont. Disallow. 1</b>		0.30 x 40% = 0.12								1.60 X 30% = 0.48			
<b>Horizont. Disallow. 2</b>							1.62 x 40% = 0.65						
<b>Horizont. Disallow. 3</b>		0.95x 100% = 0.95											

BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 67/79
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***Example 4 – Computation of the market risk capital charge under the Delta-plus method for options***

**A. A single stock option**

1. Assume a banking institution has a European short call option on a KLSE CI stock with an exercise price of RM490 and a market value of the underlying 12 months from the expiration of the option at RM500; a risk-free interest rate at 8% per annum, and volatility at 20%. The current delta for this position is according to the Black-Scholes formula -0.721 (ie the price of the option changes by -0.721 if the price of the underlying moves by RM1). The Gamma is -0.0034 (ie the delta changes by -0.0034, from -0.721 to -0.7244, if the price of the underlying moves by RM1). The current value of the option is RM65.48.
2. The market risk capital charge for the single stock option is the summation of:
  - i) Specific Risk and General Risk on delta-weighted position incorporated in Chapter 12; and
  - ii) Gamma and Vega risks charge provided under Chapter 14.

Specific Risk and General Risk on delta-weighted position of equity options which will be incorporated in Chapter 12

3. To compute the specific risk and general risk on delta-weighted position of the stock option position, the following steps should be taken:
  - i) The first step under the delta-plus method is to calculate the delta-weighted option position. This is accomplished by multiplying the market value of the stock by the absolute value of the delta

$$500 \times 0.721 = \text{RM}360.5.$$

The delta-weighted position then has to be incorporated into the framework described in Chapter 12.

- ii) The specific risk for the stock option will be the multiplication of the delta-weighted position and the specific risk weight of the underlying

BNM/RH/GL 001 - 21	Prudential Financial Policy Department	Risk-Weighted Capital Adequacy Framework (Basel I)	Page 68/79
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equity (ie KLSE CI stock specific risk weight = 8%, refer to Table 9 in Chapter 12). Hence, the capital charge for specific risk will be:

$$360.5 \times 0.08 = \mathbf{RM28.84}$$

- iii) The delta risk charge will be calculated by incorporating the delta-weighted option position together with the other net equity positions generated in Chapter 12. Assuming that no other positions exist, the delta risk of the stock option is calculated as the multiplication of the delta-weighted position and the 8% general risk weight accorded to equities. Hence, the capital charge for general risk is calculated as:

$$360.5 \times 0.08 = \mathbf{RM28.84}$$

The total capital charge for specific risk and general risk on delta-weighted position which should be reflected in Chapter 12 will be: **RM57.68** (ie. 28.84 + 28.84).

#### Gamma and Vega Risks carved out to be provided in Chapter 14

4. Under the delta-plus method, the capital charges for Gamma and Vega risk will be calculated as follows:

- i) The capital charge for Gamma has to be calculated according to the formula set out in paragraph 14.6.6:

$$\frac{1}{2} \times 0.0034 \times (500 \times 0.08)^2 = \mathbf{RM2.72}$$

- ii) The capital charge for Vega has to be calculated separately. The assumed current (implied) volatility is 20%. As an increase in volatility carries a risk of loss for a short call option, the volatility has to be increased by a relative shift of 25%. This means that the Vega capital charge has to be calculated on the basis of a change in volatility of 5 percentage points from 20% to 25% in this example. According to the Black-Scholes formula used here, the Vega equals

<b>BNM/RH/GL 001 - 21</b>	<b>Prudential Financial Policy Department</b>	<b>Risk-Weighted Capital Adequacy Framework (Basel I)</b>	<b>Page 69/79</b>
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174. Thus a 1% or 0.01 increase in volatility increases the value of the option by 1.74. Accordingly, a change in volatility of 5 percentage points would increase the value by:

$$5 \times 1.74 = \mathbf{RM8.70}$$

which is the capital charge for Vega risk.

The total capital charge for Gamma and Vega risk which should be disclosed in Chapter 14 under the Delta-plus method will be **RM11.42** (ie. 2.72 + 8.70).

5. The total market risk capital charge for the single stock option is **RM69.10** (ie. 57.68+11.42).

## B. A portfolio of foreign exchange options

6. Assume a banking institution has a portfolio of options with the following characteristics:

Option	Currency Pair	Market Value of Underlying (RM)	Delta	Gamma	Vega	Assumed volatility (%)
1	RM/USD	100	-0.803	0.0018	1.84	5
2	RM/USD	600	-0.519	-0.0045	-3.87	20
3	RM/USD	200	0.182	-0.0049	-0.31	20
4	RM/USD	300	0.375	0.0061	4.97	10
5	GBP/JPY	100	-0.425	0.0065	5.21	10
6	GBP/JPY	50	0.639	-0.0016	-4.16	7
7	GBP/JPY	75	0.912	0.0068	3.15	5

7. The market risk capital charge for the portfolio of foreign exchange options is the summation of:
- i) General Risk on delta-weighted position incorporated in Chapter 13; and
  - ii) Gamma and Vega risks charge provided under Chapter 14.

General Risk on delta-weighted position of currency options which will be incorporated in Chapter 13

8. To compute the general risk on delta-weighted position of the foreign exchange option portfolio, the following steps should be taken:
- i) The first step under the delta-plus method is to calculate the delta-weighted option position. This is accomplished by multiplying the absolute value of each option's delta by the market value of the underlying currency position (see Table B, column 3). This leads to the following net delta-weighted position in each currency:

**Table B**

Option	Currency Pair	Delta × Market Value of Underlying
1	RM/USD	-80.30
2	RM/USD	-311.40
3	RM/USD	36.40
4	RM/USD	112.50
5	GBP/JPY	-42.50
6	GBP/JPY	31.95
7	GBP/JPY	68.40

- ii) Assuming that the banking institution holds no other foreign currency positions, inclusion of these positions into the framework set out in Chapter 13 yields a net open delta weighted position of 300.65 (the larger of either the sum of the net short positions or the sum of the net long positions across currency pairs) and a capital charge of **24.05** ( $300.65 \times 0.08$ ).

GBP	USD	JPY
+ 57.85	- 242.80	- 57.85
+ 57.85	- 300.65	

Hence, the capital charge for general risk on delta-weighted position of the foreign exchange option which should be reflected in Chapter 13 will be **RM24.05**.

Gamma and Vega risks carved out to be provided in Chapter 14

9. Under the delta-plus method, the capital charges for Gamma and Vega risk will be calculated as follows:

- i) The Gamma impact (see Table C, column 3) for each option is calculated as:

$$\frac{1}{2} \times \text{Gamma} \times (\text{market value of underlying} \times 0.08)^2.$$

For each underlying, in this case currency pair, a net Gamma impact is obtained:



RM/USD -4.00  
 GBP/JPY +0.32.

Only the negative Gamma impacts are included in the capital calculation, hence the Gamma charge here is **RM4.00**.

**Table C**

Option	Currency Pair	Gamma impact (RM)	Net Gamma Impact (RM)
1	RM/USD	0.0576	
2	RM/USD	-5.1840	-3.9968
3	RM/USD	-0.6272	
4	RM/USD	1.7568	
5	GBP/JPY	0.2080	
6	GBP/JPY	-0.0128	0.3176
7	GBP/JPY	0.1224	

- ii) The Vega capital charge is based on the assumed implied volatilities for each option which are shown in Table D column 3. The 25 per cent volatility shifts are shown in Table D column 5. Multiplying these shifts with each option's Vega yields the assumed price changes (shown in Table D column 6). These are then summed up for each currency pair. The net Vega impact for each currency pair is:

RM/USD -6.18  
 GBP/JPY +9.68.

Since no netting of Vegas is permitted across currency pairs, the capital charge is calculated as the sum of the absolute values obtained for each currency pair:  $6.18 + 9.68 = \mathbf{RM15.86}$

**Table D**

Option	Currency Pair	Assumed Volatility (%)	Vega	Volatility Shift (Percentage Points)	Change in Value (RM)	Net Vega Impact (RM)
1	RM/USD	5	1.84	1.25	2.30	-6.18
2	RM/USD	20	-3.87	5.00	-19.35	
3	RM/USD	20	-0.31	5.00	-1.55	
4	RM/USD	10	4.97	2.50	12.43	
5	GBP/JPY	10	5.21	2.50	13.03	9.68
6	GBP/JPY	7	-4.16	1.75	-7.28	
7	GBP/JPY	5	3.15	1.25	3.94	

The total capital charge for Gamma and Vega risk arising from the options portfolio which should be disclosed in the Chapter 14 under the Delta-plus method is RM19.86 (4.00 + 15.86).

- iii) The total market risk capital charge for the portfolio of foreign currency options is **RM43.91** (ie. 24.05+19.86).

**Example 5 – Computation of the market risk capital charge under the Scenario approach for options**

1. Consider a banking institution holding a portfolio with positions in two KLSE CI stocks and two accompanying option positions, as set out below:

**Shares**

		No of shares	Current price (RM)
Long	ABC	100	19.09
Short	XYZ65	50	1.79

**Options**

		No of shares	Option Type	Delta	Time to expiry (yrs)	Strike price (RM)	Current volatility (%)
Long	ABC	50	Call	0.35	0.45	20.00	0.15
Short	XYZ	20	Put	0.85	0.36	2.25	0.42

2. The market risk capital charge for the portfolio of two KLSE CI stocks and two option position on the two KLSE CI stocks is the summation of :
  - i) Specific Risk on delta-weighted position incorporated in Chapter 12; and
  - ii) Entire General risk carved out and provided under Scenario Approach in Chapter 14.

Specific Risk on delta-weighted position of stock option portfolio which will be incorporated in Chapter 12

3. To compute the specific risk of the stock and stock option portfolio, the following steps should be taken:
  - i) Calculate the delta-weighted stock option positions and the underlying equity position – The delta weighted option is calculated

<sup>65</sup> Currently, short selling of securities are not allowed in the Malaysian capital market. This example is for illustration purposes only.

by multiplying the value of each option's delta by the market value of the underlying equity position (see Table E, column 2). This leads to the following net delta-weighted positions in each equity:

**Table E**

Options Position	Delta × Market Value of Underlying (RM)	Number of shares	Total Position (RM)
Option on ABC	6.491	50	324.53
Option on XYZ	-1.396	-20	27.92

Equity Position	Market Value (RM)	Number of shares	Total Position (RM)
ABC	19.09	100	1,909.00
XYZ	1.79	-50	-89.50

Assuming that the banking institution holds no other equity position, inclusion of these positions into the framework set out in Chapter 12 yields a net equities position of:

$$ABC = + 2,233.53 (324.53 + 1,909.00)$$

$$XYZ = - 61.58 (27.92 - 89.5)$$

- ii) Calculate the specific risk charge by multiplying the individual specific risk weight of the equity as listed in Table 9 of Chapter 12. The specific risk weight is 10% for KLSE main board equities. Hence, the capital charge for specific risk which should be reflected in Chapter 12 will be: **RM183.61**  $((2,233.53 \times 0.08) + (61.58 \times 0.08))$ .

Entire General risk carved out to be provided under Scenario approach in Chapter 14

4. To compute the general risk under the scenario method, the following procedures are executed:

- i) Apply the price movements over the range  $\pm 8\%$  to the share positions. The change in portfolio values is shown below:

#### Change in value of share positions

	Assumed Price Change (%)						
	-8.00	-4.67	-2.33	0.00	2.33	4.67	8.00
ABC	-152.72	-101.81	-50.91	0.00	50.91	101.81	152.72
XYZ	7.16	4.77	2.39	0.00	-2.39	-4.77	-7.16

- ii) Apply the matrix of price and volatility movements to the banking institution's holdings of ABC call option and the changes in the value of that position is shown below:

#### ABC Options - Change in Value

Assumed Volatility Change (%)	Assumed Price Change (%)						
	-8.00	-4.67	-2.33	0.00	2.33	4.67	8.00
+25	-11.38	-6.38	0.34	8.99	19.68	32.45	47.24
0	-16.22	-12.73	-7.46	0.00	9.92	22.41	37.43
-25	-19.36	-17.61	-14.24	-8.49	0.26	12.38	27.85

- iii) Similar calculations as per (b) above will give the exposure arising from the short XYZ put option.

#### XYZ Options - Change in Value

Assumed Volatility Change (%)	Assumed Price Change (%)						
	-8.00	-4.67	-2.33	0.00	2.33	4.67	8.00
+25	-2.89	-2.14	-1.42	-0.72	-0.05	0.59	1.20
0	-2.37	-1.55	-0.76	0.00	0.73	1.43	2.10
-25	-2.02	-1.13	-0.26	0.58	1.39	2.18	2.92

- iv) Summing the changes in value for each option and underlying share position yields the contingent loss matrix for the total portfolio as:

### Total Portfolio - Change in Value

Assumed Volatility Change (%)	Assumed Price Change (%)						
	-8.00	-4.67	-2.33	0.00	2.33	4.67	8.00
+25	-159.83	-105.56	-49.59	8.27	68.15	130.08	194.01
0	-164.14	-111.33	-56.74	0.00	59.17	120.88	185.10
-25	-166.94	-115.78	-63.02	-7.91	50.17	111.59	176.33

- The total capital charge for general risk arising from the stock options portfolio and its underlying equity positions results in the largest loss arising within the matrix – in this case **166.94**. This capital charge for general risk should be reflected in Chapter 14 under the Scenario approach.
- The total market risk capital charge for the portfolio of two KLSE CI stocks and two option positions on the two KLSE CI stocks is **350.54** (ie. 183.61 +166.94).



