

Chapter 7

Market risk

7.1 Application, purpose, general provisions and non-standard transactions

Application

7.1.1 **R** This chapter applies to a *BIPRU firm*.

Purpose

7.1.2 **G** Pursuant to the third paragraph of article 95(2) of the *UK CRR*, the purpose of this chapter is to apply requirements that correspond to Annexes I, III, IV and V of the *Capital Adequacy Directive*.

General provisions: Obligation to calculate PRR

7.1.3 **R** A *firm* must calculate a *PRR* in respect of:

- (1) all its *trading book positions*;
- (2) all *positions* falling within **■ BIPRU 7.5.3 R** (Scope of the foreign exchange *PRR* calculation), whether or not in the *trading book*; and
- (3) all *positions* in *commodities* (including *physical commodities*) whether or not in the *trading book*;

even if no treatment is provided for that *position* in the other sections of this chapter.

7.1.4 **R** A *firm* must calculate a *PRR* for any *position* falling into **■ BIPRU 7.1.3 R** using:

- (1) the *PRR* calculations contained in **■ BIPRU 7**; or
- (2) another method provided the *firm* is able to demonstrate that in all circumstances the calculation being employed results in a higher *PRR* for the *position* than would be required under (1).

General provisions: Non-trading book items

7.1.5 **G** *Positions* in instruments which are *non-trading book* items should be treated under **■ BIPRU 3** (Standardised credit risk), **■ BIPRU 4** (The *IRB* approach) or **■ BIPRU 13** (Financial derivatives, *SFTs* and long settlement transactions) unless deducted as an *illiquid asset*. If they fall into **■ BIPRU 7.1.3R(2)** or **■ (3)** they also give rise to a *PRR charge*.

General provisions: Frequency of calculation

7.1.6 **R** A *firm* must be able to monitor its total *PRR* on an intra-day basis, and, before executing any trade, must be able to re-calculate *PRR* to the level of detail necessary to establish whether or not the *firm's capital resources* exceed its *capital resources requirement*.

7.1.7 **G** A *firm* may rely on intra-day limits for the purposes of ■ BIPRU 7.1.6R.

Purpose of rules for non-standard transactions and instruments for which no PRR treatment has been specified

7.1.8 **G** The methodologies which have been developed for calculating *PRR charges* have been based on existing instruments and assume instruments with standard characteristics. However, as a result of innovation and because there are instruments which, although based on a standard contract, contain structural features which would make the *rules* in the rest of this chapter inappropriate, flexible *rules* are required. The *rules* in this section about transactions for which no *PRR* treatment has been specified and non-standard transactions are designed to address this.

Instruments for which no PRR treatment has been specified

7.1.9 **R** Where a *firm* has a *position* for which no *PRR* treatment has been specified, it must calculate the *PRR* for that *position* in accordance with ■ BIPRU 7.1.12R-■ BIPRU 7.1.13R.

7.1.10 **R** If ■ BIPRU 7.1.9 R applies, a *firm* must document its policies and procedures for calculating the *PRR* for that *position* of that type in its *trading book policy statement*.

7.1.11 **G** Under ■ BIPRU 1.2.30 R (2) a *firm* should notify the *appropriate regulator* as soon as is reasonably practicable if its *trading book policy statement* is subject to significant changes. Therefore if a *firm* makes a change in accordance with ■ BIPRU 7.1.10R it should consider whether it is necessary to report it to the *appropriate regulator*.

7.1.12 **R** A *firm* may calculate the *PRR* for a *position* falling into ■ BIPRU 7.1.9R by applying by analogy the *rules* relating to the calculation of the *interest rate PRR*, the *equity PRR*, the *commodity PRR*, the *foreign currency PRR*, the *option PRR* or the *collective investment undertaking PRR* if doing so is appropriate and if the *position* and *PRR item* are sufficiently similar to those that are covered by those *rules*.

7.1.13 **R** Where a *firm* has a *position* for which no *PRR* treatment has been specified and it is not applying ■ BIPRU 7.1.12R, it must calculate a *PRR* of an appropriate percentage of the current value of the *position* calculated under ■ GENPRU 1.3 (Valuation).

Instruments in non-standard form

- 7.1.14 **R** (1) If a *firm* has a *position*:
- (a) in a *PRR item* in non-standard form; or
 - (b) that is part of a non-standard arrangement; or
 - (c) that, taken together with other *positions* (whether or not they are subject to *PRR charges* under **■ BIPRU 7**), gives rise to a non-standard *market risk*;
- the *firm* must notify the *appropriate regulator* of that fact and of details about the *position*, *PRR item*, arrangements and type of risk concerned.
- (2) Except as (1) provides to the contrary, (1) applies to a *position* that is subject to a *PRR* under **■ BIPRU 7.1.3R**.
- (3) The question of what is non-standard for the purposes of (1) must be judged by reference to the standards:
- (a) prevailing at the time the *rule* is being applied; and
 - (b) of *firms* generally who carry on business which gives rise to *PRRs* under **■ BIPRU 7** rather than merely by reference to the *firm's* own business.

- 7.1.15 **R** If a *firm* has a *position* or combination of *positions* falling into **■ BIPRU 7.1.14R** and the *PRR* relating to that *position* or *positions* materially underestimates the *market risk* incurred by the *firm* to which they give rise, the *firm* must calculate the *PRR* for that *position* or *positions* under **■ BIPRU 7.1.13R**.

Meaning of appropriate percentage for non-standard transactions

- 7.1.16 **E** (1) In **■ BIPRU 7.1.13R** and, to the extent that that *rule* applies **■ BIPRU 7.1.13R**, **■ BIPRU 7.1.15R**, an "appropriate percentage" is:
- (a) 100%; or
 - (b) a percentage which takes account of the characteristics of the *position* concerned and of discussions with the *appropriate regulator* or a predecessor regulator under the Banking Act 1987 or the Financial Services Act 1986.
- (2) Compliance with (1) may be relied on as tending to establish compliance with **■ BIPRU 7.1.13R** or, insofar as it incorporates the requirements relating to an appropriate percentage, **■ BIPRU 7.1.15R**.
- (3) Contravention of (1) may be relied on as tending to establish contravention with **■ BIPRU 7.1.13 R** or, insofar as it incorporates the requirements relating to an appropriate percentage, **■ BIPRU 7.1.15 R**.

Stress testing and scenario analyses of trading book positions

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

- 7.1.17A **G** The *firm's* stress testing programme should be comprehensive in terms of both risk and *firm* coverage, and appropriate to the size and complexity of *trading book positions* held.
- 7.1.18 **R** In carrying out the stress tests and scenario analyses required by ■ BIPRU 7.1.17 R, a *firm* must incorporate and take into account any other relevant stress tests and scenario analyses that it is required to carry out under any other provision of the *Handbook*, and in particular under ■ BIPRU 7.10.72 R where the *firm* has a *VaR model permission*.
- 7.1.19 **G** This paragraph gives *guidance* in relation to the stress testing programme that a *firm* must carry out in relation to its *trading book positions*.
- (1) The frequency of the stress testing of *trading book positions* should be determined by the nature of the *positions*.
 - (2) The stress testing should include shocks which reflect the nature of the portfolio and the time it could take to hedge out or manage risks under severe market conditions.
 - (3) The *firm* should have procedures in place to assess and respond to the results of the stress testing programme. In particular, stress testing should be used to evaluate the *firm's* capacity to absorb losses or to identify steps to be taken by the *firm* to reduce risk.
 - (4) As part of its stress testing programme, the *firm* should consider how prudent valuation principles (see ■ GENPRU 1.3) will be met in a stressed scenario.
- 7.1.20 **G** The stress testing and scenario analysis under ■ BIPRU 7.1.17 R should be taken into account under the *overall Pillar 2 rule*.

7.2 Interest rate PRR

General rule

7.2.1

R

- (1) A *firm* must calculate its *interest rate PRR* under ■ BIPRU 7.2 by:
- (a) identifying which *positions* must be included within the *interest rate PRR* calculation;
 - (b) deriving the net *position* in each debt *security* in accordance with ■ BIPRU 7.2.36R-■ BIPRU 7.2.41R;
 - (c) including these net *positions* in the *interest rate PRR* calculation for *general market risk* and the *interest rate PRR* calculation for *specific risk*; and
 - (d) summing all *PRRs* calculated for *general market risk* and *specific risk*.
- (2) A *firm* must calculate its *interest rate PRR* by adding the amount calculated under (1) to the amount calculated under the basic *interest rate PRR* calculation under ■ BIPRU 7.3.45R.
- (3) All net *positions*, irrespective of their signs, must be converted on a daily basis into the *firm's base currency* at the prevailing spot exchange rate before their aggregation.
- (4) Net *positions* must be classified according to the currency in which they are denominated. A *firm* must calculate the capital requirement for *general market risk* and *specific risk* in each individual currency separately.

7.2.2

G

The *interest rate PRR* calculation divides the interest rate risk into the risk of loss from a general move in market interest rates, and the risk of loss from an individual debt *security's* price changing for reasons other than a general move in market interest rates. These are called *general market risk* and *specific risk* respectively.

Scope of the interest rate PRR calculation

7.2.3

R

A *firm's interest rate PRR* calculation must:

- (1) include all *trading book positions* in debt *securities*, preference *shares* and *convertibles*, except:
 - (a) *positions* in *convertibles* which have been included in the *firm's equity PRR* calculation;

- (b) *positions* fully deducted as a *material holding* under the calculations under the *capital resources table*, in which case the *firm* may exclude them; or
 - (c) *positions* hedging an *option* which is being treated under ■ BIPRU 7.6.26R (Table: Appropriate treatment for equities, debt securities or currencies hedging options);
- (2) include notional *positions* arising from *trading book positions* in the instruments listed in the table in ■ BIPRU 7.2.4R; and
- (3) (if the *firm* is the transferor of *debt securities* or guaranteed rights relating to title to *debt securities* in a *repurchase agreement* or the lender of *debt securities* in a *debt securities* lending agreement) include such *debt securities* if those *debt securities* meet the criteria for inclusion in the *trading book*.

7.2.4

R

Table: Instruments which result in notional positions

This table belongs to ■ BIPRU 7.2.3R(2)

Instrument	See
<i>Futures, forwards or synthetic futures on debt securities</i>	BIPRU 7.2.13 R
<i>Futures, forwards or synthetic futures on debt indices or baskets</i>	BIPRU 7.2.14R
<i>Interest rate futures or forward rate agreements (FRAs)</i>	BIPRU 7.2.18 R
<i>Interest rate swaps or foreign currency swaps</i>	BIPRU 7.2.21R
<i>Deferred start interest rate swaps or foreign currency swaps</i>	BIPRU 7.2.24R
The interest rate leg of an <i>equity swap</i> (unless the <i>firm</i> calculates the <i>interest rate PRR</i> on the instrument using the basic <i>interest rate PRR</i> calculation in BIPRU 7.3 (Equity PRR and basic <i>interest rate PRR</i> for equity derivatives))	BIPRU 7.2.27R
The cash leg of a <i>repurchase agreement</i> or a <i>reverse repurchase agreement</i>	BIPRU 7.2.30R
Cash borrowings or deposits	BIPRU 7.2.31 R
<i>Options</i> on a <i>debt security</i> , a basket of <i>debt securities</i> , a <i>debt security index</i> , an <i>interest rate</i> or an <i>interest rate future or swap</i> (including an <i>option on a future on a debt security</i>) (unless the <i>firm</i> calculates a <i>PRR</i> on the <i>option</i> under BIPRU 7.6 (Option PRR))	BIPRU 7.2.32R
Dual currency bonds	BIPRU 7.2.33R
<i>Foreign currency futures or forwards</i>	BIPRU 7.2.34R
<i>Gold futures or forwards</i>	BIPRU 7.2.34R
<i>Forwards, futures or options</i> (except cliquets) on an <i>equity</i> , basket of	BIPRU 7.2.34R

Instrument	See
<i>equities</i> or <i>equity</i> index (unless the <i>firm</i> calculates the <i>interest rate PRR</i> on the instrument using the basic <i>interest rate PRR</i> calculation in BIPRU 7.3)	
Credit derivatives	BIPRU 7.11
A <i>warrant</i> must be treated in the same way as an <i>option</i>	

7.2.5 **G** ■ BIPRU 7.2.3R(1) includes a *trading book position* in debt security, preference share or convertible that is subsequently repo'd under a *repurchase agreement* or lent under a stock lending agreement. Clearly, if the *security* had initially been obtained via a *reverse repurchase agreement* or stock borrowing agreement, the *security* would not have been included in the *PRR* calculation in the first place.

7.2.6 **G** ■ BIPRU 7.2.3R(1) includes *net underwriting positions* or *reduced net underwriting position* in debt securities.

7.2.7 **G** *Firms* are reminded that the table in ■ BIPRU 7.6.5R (Table: Appropriate PRR calculation for an option or warrant) divides *options* and *warrants* on interest rates, debt securities and interest rate *futures* and *swaps* into:

- (1) those which must be treated under ■ BIPRU 7.6 (Option PRR); and
- (2) those which must be treated under either ■ BIPRU 7.2 or ■ BIPRU 7.6, the *firm* being able to choose whether ■ BIPRU 7.2 or ■ BIPRU 7.6 is used.

7.2.8 **G** Cliquets on *equities*, baskets of *equities* or *equity* indices do not attract an *interest rate PRR*. The table in ■ BIPRU 7.2.4R excludes them from the scope of the *interest rate PRR* calculation in ■ BIPRU 7.2 and ■ BIPRU 7.3.45R excludes them from the basic *interest rate PRR* calculation in ■ BIPRU 7.3 (Equity PRR and basic interest rate PRR for equity derivatives).

7.2.9 **G** The table in ■ BIPRU 7.2.4R shows that *equity derivatives* are excluded from ■ BIPRU 7.2's *PRR* calculation if they have been included in the basic *interest rate PRR* calculation in ■ BIPRU 7.3 (see ■ BIPRU 7.3.45R).

Derivation of notional positions: General approach

7.2.10 **G** ■ BIPRU 7.2.11 R - ■ BIPRU 7.2.35R convert the instruments listed in the table in ■ BIPRU 7.2.4R into notional *positions* in:

- (1) the underlying debt security, where the instrument depends on the price (or yield) of a specific debt security; or
- (2) notional debt securities to capture the pure interest rate risk arising from future payments and receipts of cash (including notional payments and receipts) which, because they are designed to represent

pure *general market risk* (and not *specific risk*), are called *zero-specific-risk securities*; or

(3) both (1) and (2).

7.2.11

R

(1) For the purposes of calculating *interest rate PRR*, unless specified otherwise, a *firm* must derive the value of notional *positions* as follows:

(a) notional *positions* in actual debt *securities* must be valued as the nominal amount underlying the contract at the current market price of the debt *security*; and

(b) *positions* in *zero-specific-risk securities* must be valued using one of the two methods in (2).

(2) A *firm* must use one of the following two methods for all *positions* arising under (1)(b) and must use the same method for all *positions* denominated in the same currency:

(a) the present value approach, under which the *zero-specific-risk security* is assigned a value equal to the present value of all the future cash flows that it represents; or

(b) the alternative approach, under which the *zero-specific-risk security* is assigned a value equal to:

(i) the market value of the underlying notional *equity position* in the case of an *equity derivative*;

(ii) the notional principal amount in the case of an interest rate or *foreign currency swap*; or

(iii) the notional amount of the future cash flow that it represents in the case of any other *CRD financial instrument*.

7.2.12

R

A *firm* must use ■ BIPRU 7.2.11R(2)(a) in respect of any *positions* that it includes in the *interest rate duration method*.

Derivation of notional positions: Futures, forwards or synthetic futures on a debt security

7.2.13

R

Futures, forwards or synthetic futures on a single debt *security* must be treated as follows:

(1) a purchased *future, synthetic future or forward* is treated as:

(a) a notional long *position* in the underlying debt *security* (or the cheapest to deliver (taking into account the conversion factor) where the contract can be satisfied by delivery of one from a range of *securities*); and

(b) a notional short *position* in a zero coupon *zero-specific-risk security* with a maturity equal to the expiry date of the *future or forward*; and

(2) a sold *future, synthetic future or forward* is treated as:

(a) a notional short *position* in the underlying *security* (or the cheapest to deliver (taking into account the conversion factor)

where the contract can be satisfied by delivery of one from a range of *securities*); and

- (b) a notional long *position* in a zero coupon *zero-specific-risk security* with a maturity equal to the expiry date of the *future, synthetic future or forward*.

Derivation of notional positions: Futures, forwards or synthetic futures on a basket or index of debt securities

7.2.14 **R** *Futures, forwards or synthetic futures on a basket or index of debt securities must be converted into forwards on single debt securities as follows (and then the resulting positions must be treated under ■ BIPRU 7.2.13R):*

- (1) *futures, synthetic futures or forwards on a single currency basket or index of debt securities must be treated as either:*
 - (a) a series of *forwards*, one for each of the constituent debt securities in the basket or index, of an amount which is a proportionate part of the total underlying the contract according to the weighting of the relevant debt security in the basket; or
 - (b) a single *forward* on a notional debt security; and
- (2) *futures, synthetic futures or forwards on multiple currency baskets or indices of debt securities must be treated as either:*
 - (a) a series of *forwards* (using the method described in (1)(a)); or
 - (b) a series of *forwards*, each one on a notional debt security to represent one of the currencies in the basket or index, of an amount which is a proportionate part of the total underlying the contract according to the weighting of the relevant currency in the basket.

7.2.15 **G** Under ■ BIPRU 7.2.14R(2)(b), a *forward* on basket of three Euro denominated debt securities and two Dollar denominated debt securities would be treated as a *forward* on a single notional Euro denominated debt security and a *forward* on a single notional Dollar denominated debt security.

7.2.16 **R** The notional debt securities in ■ BIPRU 7.2.14R are assigned a *specific risk position risk adjustment* and a *general market risk position risk adjustment* equal to the highest that would apply to the debt securities in the basket or index.

7.2.17 **G** The debt security with the highest *specific risk position risk adjustment* within the basket might not be the same as the one with the highest *general market risk position risk adjustment*. ■ BIPRU 7.2.16R requires a firm to select the highest percentages even where they relate to different debt securities in the basket or index, and regardless of the proportion of those debt securities in the basket or index.

Derivation of notional positions: Interest rate futures and forward rate agreements (FRAs)

7.2.18 **R** Interest rate *futures* or *FRAs* must be treated as the two notional *positions* (one long, one short) shown in the table in ■ BIPRU 7.2.19R.

7.2.19 **R** Table: Interest rate futures and FRAs

This table belongs to ■ BIPRU 7.2.18R

	A short <i>position</i> in a zero coupon zero-specific-risk security	A long <i>position</i> in a zero coupon zero-specific-risk security
Where the <i>firm</i> buys an interest rate <i>future</i> or sells an <i>FRA</i>	Maturity equals the expiry date of the <i>future</i> (or settlement date of the <i>FRA</i>)	Maturity equals the expiry date of the <i>future</i> (or settlement date of the <i>FRA</i>) plus the maturity of the notional borrowing/deposit
Where the <i>firm</i> sells an interest rate <i>future</i> or buys an <i>FRA</i>	Maturity equals the expiry date of the <i>future</i> (or settlement date of the <i>FRA</i>) plus the maturity of the notional borrowing/deposit	Maturity equals the expiry date of the <i>future</i> (or settlement date of the <i>FRA</i>)

7.2.20 **G**

(1) The following example illustrates ■ BIPRU 7.2.18R and ■ BIPRU 7.2.19R in conjunction with ■ BIPRU 7.2.11R (the last *rule* determines the value of notional *positions*). A *firm* sells £1mn notional of a 3v6 *FRA* at 6%. This results in:

- (a) a short *position* in a zero-specific-risk security with a zero coupon, three month maturity, and a nominal amount of £1million; and
- (b) a long *position* in a zero-specific-risk security with a zero coupon, six month maturity, and nominal amount of £1,015,000 (i.e. notional plus interest at 6% over 90 days).

(2) If a *firm* were to apply the approach in ■ BIPRU 7.2.11R(2)(a) the two nominal amounts would have to be present valued.

Derivation of notional positions: Interest rate swaps or foreign currency swaps

7.2.21 **R** Interest rate *swaps* or *foreign currency swaps* without deferred starts must be treated as the two notional *positions* (one long, one short) shown in the table in ■ BIPRU 7.2.22R.

7.2.22 **R** Table: Interest rate and foreign currency swaps

This table belongs to ■ BIPRU 7.2.21R

	Paying leg (which must be treated as a short position in a zero-specific-risk security)	Receiving leg (which must be treated as a long position in a zero-specific-risk security)
Receiving fixed and paying floating	Coupon equals the floating rate and maturity equals the reset date	Coupon equals the fixed rate of the swap and maturity equals the maturity of the swap
Paying fixed and receiving floating	Coupon equals the fixed rate of the swap and maturity equals the maturity of the swap	Coupon equals the floating rate and maturity equals the reset date
Paying floating and receiving floating	Coupon equals the floating rate and maturity equals the reset date	Coupon equals the floating rate and maturity equals the reset date

7.2.23 G For a *foreign currency swap*, the two notional *zero-specific-risk securities* would be denominated in different currencies. A *foreign currency swap* is also included in the *foreign currency PRR* calculation.

Derivation of notional positions: Deferred start interest rate swaps or foreign currency swaps

7.2.24 R Interest rate *swaps* or *foreign currency swaps* with a deferred start must be treated as the two notional *positions* (one long, one short) shown in the table in ■ BIPRU 7.2.25R.

7.2.25 R Table: Deferred start interest rate and foreign currency swaps
This table belongs to ■ BIPRU 7.2.24R

	Paying leg (which must be treated as a short position in a zero-specific-risk security with a coupon equal to the fixed rate of the swap)	Receiving leg (which must be treated as a long position in a zero-specific-risk security with a coupon equal to the fixed rate of the swap)
Receiving fixed and paying floating	maturity equals the start date of the swap	maturity equals the maturity of the swap
Paying fixed and receiving floating	maturity equals the maturity of the swap	maturity equals the start date of the swap

7.2.26 G An example of ■ BIPRU 7.2.24R is as follows. A *firm* enters into a five year *swap* which starts in two year's time. The *firm* has contracted to receive 6% and pay six month *Libor* on a principal amount of £1 million. This results in a long *position* in a 7 year *debt security* and a short *position* in a 2 year *debt security*. Both have a coupon of 6%. ■ BIPRU 7.2.24R deals with the capital treatment of the delayed start date; once the *swap* has started, ■ BIPRU 7.2.21R applies.

Derivation of notional positions: Swaps where only one leg is an interest rate leg (e.g. equity swaps)

- 7.2.27 **R** A firm must treat a *swap* with only one interest rate leg as a notional position in a zero-specific-risk security:
- (1) with a coupon equal to that on the interest rate leg;
 - (2) with a maturity equal to the date that the interest rate will be reset; and
 - (3) which is a long position if the firm is receiving interest payments and short if making interest payments.
- 7.2.28 **G** ■ BIPRU 7.2.27R includes *equity swaps, commodity swaps* and any other *swap* where only one leg is an interest rate leg.

Derivation of notional positions: Cash legs of repurchase agreements and reverse repurchase agreements

- 7.2.29 **G** Firms are reminded that for the purposes of ■ BIPRU 7.2.30R, a *repurchase agreement* includes a sell/buy back or stock lending; and a *reverse repurchase agreement* includes a buy/sell back or a stock borrowing.
- 7.2.30 **R** The forward cash leg of a *repurchase agreement* or *reverse repurchase agreement* must be treated as a notional position in a zero-specific-risk security which:
- (1) is a short notional position in the case of a *repurchase agreement*; and a long notional position in the case of a *reverse repurchase agreement*;
 - (2) has a value equal to the market value of the cash leg;
 - (3) has a maturity equal to that of the *repurchase agreement* or *reverse repurchase agreement*; and
 - (4) has a coupon equal to:
 - (a) zero, if the next interest payment date coincides with the maturity date; or
 - (b) the interest rate on the contract, if any interest is due to be paid before the maturity date.

Derivation of notional positions: Cash borrowings and deposits

- 7.2.31 **R** A cash borrowing or deposit must be treated as a notional position in a zero coupon zero-specific-risk security which:
- (1) is a short position in the case of a borrowing and a long position in the case of a deposit;
 - (2) has a value equal to the market value of the borrowing or deposit;

- (3) has a maturity equal to that of the borrowing or deposit, or the next date the interest rate is reset (if earlier); and
- (4) has a coupon equal to:
 - (a) zero, if the next interest payment date coincides with the maturity date; or
 - (b) the interest rate on the borrowing or deposit, if any interest is due to be paid before the maturity date.

Derivation of notional positions: Options and warrants

7.2.32

R

- (1) Where included in the *PRR* calculation in ■ BIPRU 7.2 (see the table in ■ BIPRU 7.2.4R), *options* and *warrants* must be treated in accordance with this *rule*.
- (2) An *option* or *warrant* on a debt *security*, a basket of debt *securities* or a debt *security* index must be treated as a *position* in that debt *security*, basket or index.
- (3) An *option* on an interest rate must be treated as a *position* in a zero coupon *zero-specific-risk security* with a maturity equal to the sum of the time to expiry of the *option* and the length of the period for which the interest rate is fixed.
- (4) An *option* on a *future* - where the *future* is based on an interest rate or debt *security* - must be treated as:
 - (a) a long *position* in that *future* for purchased call *options* and written put *options*; and
 - (b) a short *position* in that *future* for purchased put *options* and written call *options*.
- (5) An *option* on a *swap* must be treated as a deferred starting *swap*.

Derivation of notional positions: Bonds where the coupons and principal are paid in different currencies

7.2.33

R

Where a debt *security* pays coupons in one currency, but will be redeemed in a different currency, it must be treated as:

- (1) a debt *security* denominated in the coupon's currency; and
- (2) a *foreign currency forward* to capture the fact that the debt *security's* principal will be repaid in a different currency from that in which it pays coupons, specifically:
 - (a) a notional forward sale of the coupon currency and purchase of the redemption currency, in the case of a long *position* in the debt *security*; or
 - (b) a notional forward purchase of the coupon currency and sale of the redemption currency, in the case of a short *position* in the debt *security*.

Derivation of notional positions: Interest rate risk on other futures, forwards and options

7.2.34 **R** Other *futures, forwards, options* and *swaps* treated under ■ BIPRU 7.2 must be treated as *positions* in *zero-specific-risk securities*, each of which:

- (1) has a zero coupon;
- (2) has a maturity equal to that of the relevant contract; and
- (3) is long or short according to the table in ■ BIPRU 7.2.35R.

7.2.35 **R** Table: Interest rate risk on other futures, forwards, options and swaps

This table belongs to ■ BIPRU 7.2.34R.

Instrument	Notional <i>positions</i>		
<i>foreign currency forward</i> or <i>future</i>	a long <i>position</i> denominated in the currency purchased	and	a short <i>position</i> denominated in the currency sold
Gold <i>forward</i> or <i>future</i>	a long <i>position</i> if the <i>forward</i> or <i>future</i> involves an actual (or notional) sale of gold	or	a short <i>position</i> if the <i>forward</i> or <i>future</i> involves an actual (or notional) purchase of gold
<i>Equity forward</i> or <i>future</i> , or <i>option</i> (unless the <i>interest rate PRR</i> is calculated under the basic <i>interest rate PRR</i> calculation in BIPRU 7.3)	A long <i>position</i> if the contract involves an actual (or notional) sale of the underlying <i>equity</i>	or	A short <i>position</i> if the contract involves an actual (or notional) purchase of the underlying <i>equity</i>

Deriving the net position in each debt security: General

7.2.36 **R** The net *position* in a debt *security* is the difference between the value of the *firm's* long *positions* (including notional *positions*) and the value of its short *positions* (including notional *positions*) in the same debt *security*.

Deriving the net position in each debt security: Netting positions in the same debt security

7.2.37 **R**

- (1) A *firm* must not net *positions* (including notional *positions*) unless those *positions* are in the same debt *security*. This *rule* sets out the circumstances in which debt *securities* may be treated as the same for these purposes.
- (2) Subject to (3) long and short *positions* are in the same debt *security*, and a debt *security* is the same as another if and only if:
 - (a) they enjoy the same rights in all respects; and
 - (b) are fungible with each other.

- (3) Long and short *positions* in different tranches of the same debt *security* may be treated as being in the same debt *security* for the purpose of (1) where:
- (a) the tranches enjoy the same rights in all respects; and
 - (b) the tranches become fungible within 180 days and thereafter the debt *security* of one tranche can be delivered in settlement of the other tranche.

Deriving the net position in each debt security: Netting the cheapest to deliver security with other deliverable securities

7.2.38 **R** A *firm* may net a short notional *position* in the cheapest to deliver *security* arising from a short *future* or *forward* (see ■ BIPRU 7.2.13R(2)(a)) under which the seller has a choice of which debt *security* it may use to settle its obligations against a long *position* in any deliverable *security* up to a maximum of 90% of the common nominal amounts. The residual long and short nominal amounts must be treated as separate long and short *positions*.

7.2.39 **R** The netting permitted by ■ BIPRU 7.2.38R only relates to where the *firm* has sold the *future* or *forward*. It does not relate to where the *firm* has bought a *future* or *forward*.

Deriving the net position in each debt security: Netting zero-specific-risk securities with different maturities

7.2.40 **R** A *firm* may net a notional long *position* in a zero-specific-risk *security* against a notional short *position* in a zero-specific-risk *security* if:

- (1) they are denominated in the same currency;
- (2) their coupons do not differ by more than 15 basis points; and
- (3) they mature:
 - (a) on the same day, if they have residual maturities of less than one month;
 - (b) within 7 days of each other, if they have residual maturities of between one month and one year; and
 - (c) within 30 days of each other, if they have residual maturities in excess of one year.

Deriving the net position in each debt security: Reduced net underwriting positions in debt securities

7.2.41 **R** A *firm* must not net a reduced net underwriting *position* in a debt *security* with any other debt *security* *position*.

7.2.42 **G** ■ BIPRU 7.2.41R only relates to reduced net underwriting *position*.

Deriving the net position in the correlation trading portfolio

- 7.2.42A** **R** A *correlation trading portfolio* may only consist of *securitisation positions* and *nth-to-default credit derivatives* that meet the following criteria:
- (1) the *positions* are neither *resecuritisation positions*, nor *options* on a *securitisation position*, nor any other derivatives of *securitisation exposures* that do not provide a pro-rata share in the proceeds of a *securitisation tranche*;
 - (2) all reference instruments are either single-name instruments, including single-name credit derivatives, for which a liquid two-way market exists, or commonly traded indices based on reference entities which meet this criterion;
 - (3) the *positions* do not fall under the exposure classes outlined in
 - BIPRU 3.2.9 R (8) (retail claims or contingent retail claims) and
 - BIPRU 3.2.9 R (9) (claims or contingent claims secured on real estate property); and
 - (4) the *positions* do not reference a claim on a *special purpose vehicle*.
- 7.2.42B** **R** *Positions* which are not *securitisation positions* or *nth-to-default credit derivatives* may be included in the *correlation trading portfolio* only if they hedge other such *positions* in this portfolio and a liquid two-way market exists for the relevant *position* or its reference entities.
- 7.2.42C** **R** For the purposes of ■ BIPRU 7.2.42A R (2) and ■ BIPRU 7.2.42B R, a two-way market may be deemed to exist only where there are independent, bona fide offers to buy and sell, so that a price reasonably related to the last sales price or current bona fide competitive bid and offer quotations can be determined within one *business day* and settled at that price within a relatively short time conforming to trade custom.
- 7.2.42D** **R** A *firm* must calculate both the net long and the net short *positions* in the *correlation trading portfolio* by applying ■ BIPRU 7.2.36 R and ■ BIPRU 7.2.37 R or, where applicable, ■ BIPRU 7.11.13 R to ■ BIPRU 7.11.17 R.

Specific risk calculation

- 7.2.43** **R**
- (1) A *firm* must calculate the *specific risk* portion of the *interest rate PRR* for each debt *security* by multiplying the market value of the individual net *position* (ignoring the sign) by the *appropriate position risk adjustment* from the table in ■ BIPRU 7.2.44R or as specified by
 - BIPRU 7.2.45R - ■ BIPRU 7.2.48L R or by ■ BIPRU 7.11.13 R -
 - BIPRU 7.11.17 R.
 - (2) Notional *positions* in *zero-specific-risk securities* do not attract *specific risk*.
 - (3) For the purpose of (1), a *firm* may cap the product of multiplying the individual net *position* by the *appropriate position risk adjustment* at the maximum possible default-risk-related loss. For a short *position* in a credit derivative, a *firm* may calculate the maximum possible

default-risk-related loss as a change in value due to the underlying names immediately becoming default-risk-free.

7.2.44 **R** Table: specific risk position risk adjustments

This table belongs to **■** BIPRU 7.2.43R.

Issuer	Residual maturity	Position risk adjustment
Debt securities issued or guaranteed by central governments, issued by <i>central banks, international organisations, multilateral development banks</i> or <i>United Kingdom</i> regional governments or local authorities which would qualify for <i>credit quality step 1</i> or which would receive a <i>0% risk weight</i> under the <i>standardised approach</i> to credit risk.	Any	0%
(A) Debt securities issued or guaranteed by central governments, issued by <i>central banks, international organisations, multilateral development banks</i> or <i>United Kingdom</i> regional governments or local authorities which would qualify for <i>credit quality step 2</i> or <i>3</i> under the <i>standardised approach</i> to credit risk.	Zero to six months	0.25%
	over 6 and up to and including 24 months	1%
	Over 24 months	16%
(B) Debt securities issued or guaranteed by <i>institutions</i> which would qualify for <i>credit quality step 1</i> or <i>2</i> under the <i>standardised approach</i> to credit risk.		
(C) Debt securities issued or guaranteed by <i>institution</i> which would qualify for <i>credit quality step 3</i> under BIPRU 3.4.34 R (Exposures to institutions: Credit assessment based method) or which would do so if it had an original effective maturity of three months or less.		
(D) Debt securities issued or guaranteed by <i>corporates</i> which would qualify for <i>credit quality step 1, 2</i> or <i>3</i> under the <i>standardised approach</i> to credit risk.		
(E) Other <i>qualifying debt securities</i> (see BIPRU 7.2.49R)		
(A) Debt securities issued or guaranteed by central governments, issued by <i>central banks, international organisations, multilateral development banks</i> or <i>United Kingdom</i> regional governments or local authorities or <i>institutions</i> which would qualify for <i>credit quality step 4</i> or <i>5</i> under the <i>standardised approach</i> to credit risk.	Any	8%
(B) Debt securities issued or guaranteed by <i>corporates</i> which would qualify for <i>credit quality step 4</i> under the <i>standardised approach</i> to credit risk.		
(C) Exposures for which a credit assessment by a <i>nominated ECAI</i> is not available.		

Issuer	Residual maturity	Position risk adjustment
<p>(A) Debt securities issued or guaranteed by central governments, issued by <i>central banks, international organisations, multilateral development banks</i> or <i>United Kingdom</i> regional governments or local authorities or <i>institution</i> which would qualify for <i>credit quality step 6</i> under the <i>standardised approach</i> to credit risk.</p> <p>(B) Debt securities issued or guaranteed by <i>corporate</i> which would qualify for <i>credit quality step 5</i> or <i>6</i> under the <i>standardised approach</i> to credit risk.</p> <p>(C) An instrument that shows a particular risk because of the insufficient solvency of the issuer of liquidity. This paragraph applies even if the instrument would otherwise qualify for a lower <i>position risk adjustment</i> under this table.</p> <p>Note: The question of what a <i>corporate</i> is and of what category a debt security falls into must be decided under the <i>rules</i> relating to the <i>standardised approach</i> to credit risk.</p>	Any	12%

[Note: CAD Annex I point 14 Table 1]

7.2.45 **R** To the extent that a *firm* applies the *IRB approach*, to qualify for a *credit quality step* for the purpose of the table in **■ BIPRU 7.2.44R** the obligor of the exposure must have an internal rating with a *PD* equivalent to or lower than that associated with the appropriate *credit quality step* under the *standardised approach* to credit risk.

7.2.46 **R** A debt security issued by a non-qualifying issuer must receive a *specific risk position risk adjustment* of 8% or 12% according to the table in **■ BIPRU 7.2.44R**. However a *firm* must apply a higher *specific risk position risk adjustment* to such a *debt security* and/or not recognise offsetting for the purposes of defining the extent of *general market risk* between such a *security* and any other debt securities to the extent that doing otherwise would not be a prudent treatment of *specific risk* or *general market risk*.

7.2.46A **G** **■ BIPRU 7.2.43 R** includes both actual and notional *positions*. However, notional *positions* in a *zero-specific-risk security* do not attract *specific risk*. For example:

(1) interest-rate swaps, foreign-currency swaps, FRAs, interest-rate futures, foreign-currency forwards, foreign-currency futures, and the cash leg of repurchase agreements and reverse repurchase agreements create notional *positions* which will not attract *specific risk*; while

(2) futures, forwards and swaps which are based on the price (or yield) of one or more debt securities will create at least one notional *position* that attracts *specific risk*.

Specific risk: securitisations and resecuritisations

- 7.2.47 **R** [deleted]
- 7.2.47A **G** [deleted]
- 7.2.47B **G** [deleted]
- 7.2.47C **G** [deleted]
- 7.2.48 **G** [deleted]
- 7.2.48A **R** (1) Subject to (3), a *firm* must calculate the *specific risk* portion of the *interest rate PRR* for each *securitisation* and *resecuritisation position* by multiplying the market value of the individual net *position* (ignoring the sign) by the *appropriate position risk adjustment* from the table in **■ BIPRU 7.2.48D R** or **■ BIPRU 7.2.48E R**, or in accordance with **■ BIPRU 7.2.48F R**, as applicable.
- (2) In calculating the *specific risk* capital charge of an individual net *securitisation* or *resecuritisation position*, a *firm* may cap the product of the weight and the individual net position at the maximum possible default-risk-related loss. For a short position, that limit may be calculated as a change in value due to the underlying names immediately becoming default-risk-free.
- (3) For a transitional period ending on 31 December 2013, where a *firm* holds *securitisation* and *resecuritisation positions*, other than *positions* included in the *correlation trading portfolio*, it must calculate:
- (a) the total *specific risk* capital charges that would apply just to the net long *positions*; and
- (b) the total *specific risk* capital charges that would apply just to the net short *positions*.
- The total *specific risk* capital charge for *securitisation* and *resecuritisation positions* will be the higher of (3)(a) and (3)(b).
- 7.2.48B **R** The *firm* must report to the *appropriate regulator* the total sum of its weighted net long and net short *securitisation* and *resecuritisation positions*, broken down by types of underlying assets.
- 7.2.48C **R** When calculating the *PRR* of a *protection seller* in *securitisation* and *resecuritisation* credit derivatives, a *firm* must apply **■ BIPRU 7.11.3 R**.
- 7.2.48D **R** Table: specific risk position risk adjustments - standardised approach

Credit quality step	1	2	3	4 (only for credit assessments other than short-term credit assessments)	All other credit quality steps
Securitisations	1.6%	4%	8%	28%	100%
Resecuritisations	3.2%	8%	18%	52%	100%

A firm may only apply the *position risk adjustments* in this table where it would have to calculate a *risk weighted exposure amount* in accordance with the *standardised approach to securitisation and resecuritisation positions* if such *positions* were in its *non-trading book* under BIPRU 9. The *appropriate position risk adjustment* is calculated as 8% of the *risk weight* that would apply to the *position* under the *standardised approach* in BIPRU 9.11.2 R, subject to the requirements of BIPRU 9.9 to BIPRU 9.11, where appropriate.

7.2.48E **R** Table: specific risk Position Risk Adjustments - IRB approach

Credit Quality Step	Securitisation positions			Resecuritisation positions				
	Credit assessments other than short term	Short-term credit assessments		A	B	C	D	E
1	1			0.56%	0.96%	1.6%	1.6%	2.4%
2				0.64%	1.20%	2%	2%	3.2%
3				0.8%	1.44%	2.8%	2.8%	4%
4	2			0.96%	1.6%		3.2%	5.2%
5				1.60%	2.8%		4.8%	8%
6				2.8%	4%		8%	12%
7	3			4.8%	6%		12%	18%
8				8%			16%	28%
9				20%			24%	40%
10				34%			40%	52%
11				52%			60%	68%
all other unrated				100%				

A firm may only apply the *position risk adjustments* in this table where it would have to calculate a *risk weighted exposure amount* in accordance with the *IRB approach to securitisation and resecuritisation positions* if such *positions* were in its *non-trading book* under BIPRU 9. The *appropriate position risk adjustment* is calculated as 8% of the *risk weight* that would apply to the *position* under the *IRB approach* in BIPRU 9.12.11 R, subject to the requirements in BIPRU 9.12 where appropriate.

- 7.2.48F **R**
- (1) A firm may use the *supervisory formula method* to calculate the *appropriate position risk adjustment* for *specific risk* where:
 - (a) the firm is permitted to apply the *supervisory formula method* to the same *position* if it was held in its *non-trading book* in accordance with ■ BIPRU 9.12; or

- (b) otherwise, the *firm* is expressly permitted by its *VaR model permission* to apply the *supervisory formula method* to calculate the *appropriate position risk adjustment* for *specific risk*.
- (2) The *appropriate position risk adjustment* under the *supervisory formula method* must be calculated by multiplying the *risk weight* calculated according to ■ BIPRU 9.12.21 R by 8%.
- (3) Where relevant, estimates of *PDs* and *LGDs* as inputs to the *supervisory formula method* must be determined in accordance with ■ BIPRU 4.
- (4) Where expressly permitted by its *VaR model permission*, a *firm* may use the approach outlined in ■ BIPRU 7.10.55A R to ■ BIPRU 7.10.55S G (Incremental Risk Charge) to determine *PDs* and *LGDs* as inputs to the *supervisory formula method*.
- 7.2.48G** **R** Where a *securitisation position* in the *trading book* is subject to an increased *risk weight* in accordance with ■ BIPRU 9.15, the *appropriate position risk adjustment* must be calculated as 8% of the *risk weight* that would apply to the *position* in accordance with ■ BIPRU 9.15.
- 7.2.48H** **G** *Originators*, investors and *sponsors* of *securitisations* in the *trading book* will have to meet the requirements of ■ BIPRU 9.3.1A R, ■ BIPRU 9.3.15 R to ■ BIPRU 9.3.20 R and ■ BIPRU 9.15.
- 7.2.48I** **G**
- (1) Subject to ■ BIPRU 7.2.48J G, ■ BIPRU 9.15.9 R and ■ BIPRU 9.15.10 R, where the investor, *originator* or *sponsor* of a *securitisation* fails to meet any of the requirements in ■ BIPRU 9.3.18 R to ■ BIPRU 9.3.20 R (Disclosure requirements) and ■ BIPRU 9.15.11 R to ■ BIPRU 9.15.16 R (investor due diligence requirements) in any material respect by reason of its negligence or omission, the *appropriate regulator* will use its powers under section 55J (Variation etc. on the Authority's own initiative) of the *Act* to impose an additional capital charge in accordance with ■ BIPRU 7.2.48 GR. The additional capital charge imposed will be progressively increased with each relevant, subsequent infringement of the requirements in ■ BIPRU 9.3.18 R to ■ BIPRU 9.3.20 R and ■ BIPRU 9.15.11 R to ■ BIPRU 9.15.16A R, up to a maximum of 1250% *risk weight*.
- (2) Subject to ■ BIPRU 9.3.22 G, ■ BIPRU 9.15.9 R and ■ BIPRU 9.15.10 R, where a *credit institution* fails to meet in any material respect the requirements in ■ BIPRU 9.15.16A R (Group level requirements), the *appropriate regulator* may consider using its powers under section 55J (Variation etc on the Authority's own initiative) of the *Act* in the manner described in (1). In order to calculate the *risk weights* that would apply to the *credit institution*, the *appropriate regulator* may treat the *securitisation investments* of the *subsidiary undertaking* as if they were *securitisation positions* held directly by the *credit institution*.
- 7.2.48J** **G** When calculating the additional capital charge it will impose under ■ BIPRU 7.2.48G R, the *appropriate regulator* will take into account the exemption of certain *securitisations* from the scope of ■ BIPRU 9.15.3 R under

■ BIPRU 9.15.9 R and ■ BIPRU 9.15.10 R and, if those exemptions are relevant, it will reduce the capital charge it would otherwise impose.

- 7.2.48K** **R** A *securitisation exposure* in the *trading book* that would be subject to deduction in accordance with ■ GENPRU 2.2. (Capital resources) or to a 1250% *risk weight* in accordance with ■ BIPRU 9 (Securitisation) is subject to a capital charge that is no less than that set out under those provisions, capped at the maximum possible default-risk-related loss. Unrated liquidity facilities are subject to a capital charge that is no less than that set out in ■ BIPRU 9.

Specific risk: correlation trading portfolio

- 7.2.48L** **R**
- (1) Where a *firm* holds a *position* in the *correlation trading portfolio*, it must calculate:
 - (a) The total *specific risk* capital charges that would apply just to the net long *positions* of the *correlation trading portfolio*; and
 - (b) The total *specific risk* capital charges that would apply just to the net short *positions* of the *correlation trading portfolio*.
 - (2) The higher of (1)(a) and (1)(b) will be the *specific risk* capital charge for the *correlation trading portfolio*.
 - (3) In calculating the *specific risk* capital charge of an individual net *position* in the *correlation trading portfolio*, a *firm* may cap the product of multiplying the individual net *position* by the *appropriate position risk adjustment* at the maximum possible default-risk-related loss. For a short *position*, a *firm* may calculate the maximum possible default-risk-related loss as a change in value due to the underlying names immediately becoming default-risk-free.

Definition of a qualifying debt security

- 7.2.49** **R** A debt security is a *qualifying debt security* if:
- (1) it qualifies for a *credit quality step* under the *standardised approach* to credit risk corresponding at least to investment grade; or
 - (2) it has a *PD* which, because of the solvency of the issuer, is not higher than that of the *debt securities* referred to under (1) under the *IRB approach*; or
 - (3) it is a *debt security* for which a credit assessment by a *nominated ECAI* is unavailable and which meets the following conditions:
 - (a) it is considered by the *firm* to be sufficiently liquid;
 - (b) it is of investment quality, according to the *firm's* own discretion, at least equivalent to that of the *debt securities* referred to under (1); and
 - (c) it is listed on at least one *regulated market* or *designated investment exchange*; or
 - (4) it is a *debt security* issued by an *institution* subject to the capital adequacy requirements set out in the *UK CRR* or, as may be applicable, *GENPRU* and *BIPRU*, that satisfies the following conditions:

- (a) it is considered by the *firm* to be sufficiently liquid;
 - (b) its investment quality is, according to the *firm's* own discretion, at least equivalent to that of the assets referred to under (1) above; or
- (5) it is a *debt security* issued by an *institution* that is deemed to be of equivalent or higher credit quality than that associated with *credit quality step 2* under the *standardised approach* to credit risk and that is subject to supervision and regulatory arrangements comparable to those under *GENPRU* and *BIPRU*.

7.2.50 **R** A *firm* must not treat a *debt security* as a *qualifying debt security* if it would be prudent to consider that the *debt security* concerned is subject to too high a degree of *specific risk* for it to be treated as a *qualifying debt security*.

7.2.51 **G** The manner in which a *firm* assesses a *debt security* for the purpose of treatment as a *qualifying debt security* will be subject to scrutiny by the *appropriate regulator*. The *appropriate regulator* may take action to overturn the *firm's* judgement if it considers that the *debt security* should not be treated as a *qualifying debt security*.

General market risk calculation: General

7.2.52 **R** A *firm* must calculate the *general market risk* portion of the *interest rate PRR* for each currency using either:

- (1) the *interest rate simplified maturity method*;
- (2) the *interest rate maturity method*; or
- (3) the *interest rate duration method*.

7.2.53 **R** ■ BIPRU 7.2.52R(3) is subject to ■ BIPRU 7.2.54R.

7.2.54 **R** A *firm* must not use the *interest rate duration method* for index-linked *securities*. Instead, these *securities* must:

- (1) be attributed a coupon of 3%; and
- (2) be treated separately under either the *interest rate simplified maturity method* or the *interest rate maturity method*.

General market risk calculation: Simplified maturity method

7.2.55 **G** The *interest rate simplified maturity method* weights individual net *positions* to reflect their price sensitivity to changes in interest rates. The weights are related to the coupon and the residual maturity of the instrument (or the next interest rate re-fix date for floating rate items).

7.2.56 **R** Under the *interest rate simplified maturity method*, the portion of the *interest rate PRR* for general market risk equals the sum of each individual net *position* (long or short) multiplied by the *appropriate position risk adjustment* in the table in **■ BIPRU 7.2.57R**. A *firm* must assign its net *positions* to the appropriate maturity bands in the table in **■ BIPRU 7.2.57R** on the basis of residual maturity in the case of fixed-rate instruments and on the basis of the period until the interest rate is next set in the case of instruments on which the interest rate is variable before final maturity.

7.2.57 **R** Table: general market risk Position Risk Adjustments

This table belongs to **■ BIPRU 7.2.56R**.

Zone	Maturity band		<i>position risk adjustment</i>
	Coupon of 3% or more	Coupon of less than 3%	
One	0 ≤ 1 month	0 ≤ 1 month	0.00%
	> 1 ≤ 3 months	> 1 ≤ 3 months	0.20%
	> 3 ≤ 6 months	> 3 ≤ 6 months	0.4%
	> 6 ≤ 12 months	> 6 ≤ 12 months	0.7%
Two	> 1 ≤ 2 years	> 1.0 ≤ 1.9 years	1.25%
	> 2 ≤ 3 years	> 1.9 ≤ 2.8 years	1.75%
	> 3 ≤ 4 years	> 2.8 ≤ 3.6 years	2.25%
Three	> 4 ≤ 5 years	> 3.6 ≤ 4.3 years	2.75%
	> 5 ≤ 7 years	> 4.3 ≤ 5.7 years	3.25%
	> 7 ≤ 10 years	> 5.7 ≤ 7.3 years	3.75%
	> 10 ≤ 15 years	> 7.3 ≤ 9.3 years	4.5%
	> 15 ≤ 20 years	> 9.3 ≤ 10.6 years	5.25%
	> 20 years	> 10.6 ≤ 12.0 years	6.00%
		> 12.0 ≤ 20.0 years	8.00%
		> 20 years	12.50%

General market risk calculation: The maturity method

7.2.58 **G** The *interest rate maturity method* builds on the *interest rate simplified maturity method* by partially recognising offsetting *positions*. **■ BIPRU 7.2.61G** provides an illustration of the *interest rate maturity method*.

7.2.59 **R** Under the *interest rate maturity method*, the portion of the *interest rate PRR* for general market risk is calculated as follows:

- (1) Step 1: each net *position* is allocated to the appropriate maturity band in the table in **■ BIPRU 7.2.57R** and multiplied by the corresponding *position risk adjustment*;
- (2) Step 2: weighted long and short *positions* are matched within:
 - (a) the same maturity band;

7.2.60

G The table in ■ BIPRU 7.2.57R distinguishes between debt *securities* with a coupon of less than 3% and those with coupon in excess of 3%. However, this does not mean that the *firm* has to do a separate *general market risk* calculation for each; it merely ensures that when allocating debt *securities* to a particular band, their coupons are taken into account as well as their maturities. So for example, a 21 year 6% debt *security* falls into the same band as an 11 year 2% debt *security*. They are both weighted at 6%, and can be matched under ■ BIPRU 7.2.59R(2)(a) (the first part of step two of the *interest rate maturity method* calculation) because they fall within the same band.

- (b) the same zone (using unmatched *positions* from (a)); and
 - (c) different zones (using unmatched *positions* from (b) and matching between zones 1 and 2 and 2 and 3 before zone 1 and 3); and
- (3) Step 3: the portion of the *interest rate PRR* for *general market risk* is the sum of:
- (a) 10% of the total amount matched within maturity bands;
 - (b) 40% of the amount matched within zone 1 under (2)(b);
 - (c) 30% of the amount matched within zones 2 & 3 under (2)(b);
 - (d) 40% of the amounts matched between zones 1 and 2, and between zones 2 and 3;
 - (e) 150% of the amount matched between zones 1 and 3; and
 - (f) 100% of the weighted *positions* remaining unmatched after (2)(c).

(c) r =yield to maturity. In the case of a fixed-rate debt *security* a *firm* must take the current mark to market of the debt *security* and thence calculate its yield to maturity, which is the implied discount rate for that instrument. In the case of a floating rate instrument, a *firm* must take the current mark to market of the debt *security* and thence calculate its yield on the assumption that the principal is due on the date that the interest rate can next be changed.

(d) t =time

7.2.64

R

Under the *interest rate duration method*, the portion of the *interest rate PRR* for *general market risk* is calculated as follows:

- (1) Step 1: allocate each net *position* to the appropriate duration zone in the table in ■ BIPRU 7.2.65R and multiply it by:
 - (a) its modified duration (using the formula in ■ BIPRU 7.2.63R); and
 - (b) the appropriate assumed interest rate change in the table in ■ BIPRU 7.2.65R;
- (2) Step 2: match weighted long and short *positions*:
 - (a) within zones; and
 - (b) across zones (using unmatched *positions* from (2)(a) and following the process in ■ BIPRU 7.2.59R (2)(c)); and
- (3) Step 3: calculate the portion of the *interest rate PRR* for *general market risk* as the sum of:
 - (a) 100% of the weighted *positions* remaining unmatched after (2)(b);
 - (b) 2% of the matched weighted *position* in each zone;
 - (c) 40% of the matched weighted *position* between zones 1 and 2, and between zones 2 and 3; and
 - (d) 150% of the matched weighted *position* between zones 1 and 3.

7.2.65

R

Table: Assumed interest rate change in the interest rate duration method

This table belongs to ■ BIPRU 7.2.64R

Zone	Modified Duration	Assumed interest rate change (percentage points)
1	$0 \leq 12$ months	1.00
2	> 12 months ≤ 3.6 years	0.85
3	> 3.6 years	0.70

7.2.66

R

If a *firm* uses the *interest rate duration method* it must do so on a consistent basis.

7.3 Equity PRR and basic interest rate PRR for equity derivatives

General rule

- 7.3.1 **R** (1) A firm must calculate its equity PRR by:
- (a) identifying which *positions* must be included within the PRR calculation (see ■ BIPRU 7.3.2R);
 - (b) deriving the net *position* in each equity in accordance with ■ BIPRU 7.3.23R;
 - (c) including each of those net *positions* in either the *simplified equity method* (see ■ BIPRU 7.3.29R) or, subject to ■ BIPRU 7.3.27R, the *standard equity method* (see ■ BIPRU 7.3.32R); and
 - (d) summing the PRR on each net *position* as calculated under the *simplified equity method* and *standard equity method*.
- (2) All net *positions*, irrespective of their signs, must be converted on a daily basis into the *firm's base currency* at the prevailing spot exchange rate before their aggregation.

Scope of the equity PRR calculation

- 7.3.2 **R** A firm's equity PRR calculation must:
- (1) include all *trading book positions* in equities, unless:
 - (a) the *position* is fully deducted as a *material holding* under the calculations under the *capital resources table*, in which case the firm may exclude it; or
 - (b) the *position* is hedging an *option* or *warrant* which is being treated under ■ BIPRU 7.6.26R (Table: Appropriate treatment for equities, debt securities or currencies hedging options);
 - (2) include notional *positions* arising from *trading book positions* in the instruments listed in the table in ■ BIPRU 7.3.3R; and
 - (3) (if the firm is the transferor of equities or guaranteed rights relating to title to equities in a *repurchase agreement* or the lender of equities in an *equities lending agreement*) include such equities if those equities meet the criteria for inclusion in the *trading book*.

- 7.3.3 **R** Table: Instruments which result in notional positions
This table belongs to ■ BIPRU 7.3.2R(2)

Instrument	See
Depository receipts	BIPRU 7.3.12R
Convertibles where:	BIPRU 7.3.13R
<p>(a) the <i>convertible</i> is trading at a market price of less than 110% of the underlying <i>equity</i>; and the first date at which conversion can take place is less than three months ahead, or the next such date (where the first has passed) is less than a year ahead; or</p> <p>(b) the conditions in (a) are not met but the <i>firm</i> includes the <i>convertible</i> in its <i>equity PRR</i> calculation rather than including it in its <i>interest rate PRR</i> calculation set out in BIPRU 7.2 (Interest rate PRR).</p>	
<i>Futures, forwards, CFDs and synthetic futures on a single equity</i>	BIPRU 7.3.14R
<i>Futures, forwards, CFDs and synthetic futures on a basket of equities or equity index</i>	BIPRU 7.3.15R
<i>equity legs of an equity swap</i>	BIPRU 7.3.19R
<i>Options or warrants on a single equity, an equity future, a basket of equities or an equity index (unless the firm calculates a PRR on the option or warrant under BIPRU 7.6).</i>	BIPRU 7.3.21R

7.3.4 G ■ BIPRU 7.3.2R(1) includes a *trading book position* in an *equity* that is subsequently repo'd under a *repurchase agreement* or lent under a stock lending agreement. Clearly, if the *equity* had initially been obtained via a *reverse repurchase agreement* or stock borrowing agreement, the *equity* would not have been included in the *trading book* in the first place.

7.3.5 G ■ BIPRU 7.3.2R(1) includes *net underwriting positions* or *reduced net underwriting positions* in *equities*. ■ BIPRU 7.3.27R requires a *firm* to use the *simplified equity method* in the case of *reduced net underwriting positions*. In the case of *net underwriting positions* that have not been reduced according to ■ BIPRU 7.8.27R (Calculating the reduced net underwriting position), there is no such restriction; a *firm* can choose which of the two *equity* methods to use.

7.3.6 G *Firms* are reminded that the table in ■ BIPRU 7.6.5R (Table: Appropriate PRR calculation for an option or warrant) divides *equity options* and *warrants* into:

- (1) those which must be treated under ■ BIPRU 7.6 (Option PRR); and

- (2) those which must be treated under either ■ BIPRU 7.3 or ■ BIPRU 7.6, the *firm* being able to choose whether ■ BIPRU 7.3 or ■ BIPRU 7.6 is used.

7.3.7 **G** The table in ■ BIPRU 7.3.3R does not require every *convertible* to be included in ■ BIPRU 7.3 's *PRR* calculation. Where a *convertible* is not included in this *PRR* calculation, ■ BIPRU 7.2.3R (1) (Scope of the interest rate *PRR* calculation) requires that it be included in the ■ BIPRU 7.2 *PRR* calculation.

7.3.8 **G** Some of the instruments listed in the table in ■ BIPRU 7.3.3R are also included in a *firm's interest rate PRR* calculation. For simplicity, a *firm* may use the *interest rate PRR* calculation in ■ BIPRU 7.3 rather than the calculation in ■ BIPRU 7.2 (Interest rate *PRR*). ■ BIPRU 7.3.44G explains this in more detail.

Derivation of notional positions: General approach

7.3.9 **G** ■ BIPRU 7.3.10R - ■ BIPRU 7.3.21R convert the instruments listed in the table in ■ BIPRU 7.3.3R into notional *positions* in individual *equities*, *equity* baskets or *equity* indices.

7.3.10 **R** Unless specified otherwise, the value of each notional *equity position* equals the quantity of that *equity* underlying the instrument multiplied by the current market value of the *equity*.

7.3.11 **G**

(1) An example of ■ BIPRU 7.3.10R is as follows. The current market value of a particular *equity* is £2.50. If a *firm* contracts to sell this *equity* in five year's time for £3 it would treat the notional short *equity position* as having a value of £2.50 when calculating the *equity PRR*.

(2) In effect, the forward *position* has been treated as being equivalent to a spot *position* for the purposes of calculating *equity PRR*. To capture the risk that the forward price changes relative to the spot price, forward *equity positions* are included in the *firm's interest rate PRR* calculation (see ■ BIPRU 7.3.45R or the table in ■ BIPRU 7.2.4R (Table: Instruments which result in notional positions)).

Derivation of notional positions: Depository receipts

7.3.12 **R** A depository receipt must be treated as a notional *position* in the underlying *equity*.

Derivation of notional positions: Convertibles

7.3.13 **R** Where a *convertible* is included in ■ BIPRU 7.3's *PRR* calculation (see the table in ■ BIPRU 7.3.3R):

- (1) it must be treated as a *position* in the *equity* into which it converts; and
- (2) the *firm's equity PRR* must be adjusted by making:
- (a) an addition equal to the current value of any loss which the *firm* would make if it did convert to *equity*; or

- (b) a deduction equal to the current value of any profit which the *firm* would make if it did convert to *equity* (subject to a maximum deduction equal to the *PRR* on the notional *position* underlying the *convertible*).

Derivation of notional positions: Futures, forwards and CFDs on a single equity

7.3.14 **R** A *future* (including a *synthetic future*), *forward* or *CFD* on a single *equity* must be treated as a notional *position* in that *equity*.

Derivation of notional positions: Futures, forwards and CFDs on equity indices or baskets

7.3.15 **R** A *future* (including a *synthetic future*), *forward* or *CFD* on an *equity* index or basket must be treated as either:

- (1) a *position* in each of the underlying *equities*; or
- (2) the *positions* shown in the table in ■ BIPRU 7.3.16R.

7.3.16 **R** Table: Instruments which result in notional positions

This table belongs to ■ BIPRU 7.3.15R(2)

	Under the <i>simplified equity method</i> (BIPRU 7.3.29R)	Under the <i>standard equity method</i> (BIPRU 7.3.32R)		
Only one country in the index or basket (see BIPRU 7.3.32R)	One <i>position</i> in the index or basket	One <i>position</i> in the index or basket		
More than one country in the index or basket	One <i>position</i> in the index or basket	Several notional basket <i>positions</i> , one for each country	or	One notional basket <i>position</i> in a separate, notional country

7.3.17 **G** An example of ■ BIPRU 7.3.16R is as follows. A *firm* decides to treat a FTSE Eurotop 300 *future* under the *standard equity method*, and furthermore, chooses to treat it as one notional *position*. The table in ■ BIPRU 7.3.16R requires that this notional *position* be treated as if it were from a separate notional country rather than any of the countries to which the underlying *equities* are from.

7.3.18 **R** The notional *positions* created under ■ BIPRU 7.3.15R have the following values:

- (1) where only one notional *position* is created, it has a value equal to the total market value of the *equities* underlying the contract; or

- (2) where more than one notional *position* is created, each one has a value which reflects the relevant *equity's* or country's contribution to the total market value of the *equities* underlying the contract.

Derivation of notional positions: Equity legs of equity swaps

7.3.19 **R** The *equity* leg of an *equity swap* must be treated as a *position* in the underlying *equity*, *equity* basket or *equity* index, which is:

- (1) long, if the *firm* has contracted to receive any increase and pay any decrease in the value of the underlying *equities* or *equity* index; and
- (2) short, if the *firm* has contracted to receive any decrease and pay any increase in the value of the underlying *equities* or *equity* index.

7.3.20 **G** The interest rate leg of an *equity swap* is included in a *firm's interest rate PRR* calculation (see the table in **BIPRU 7.2.4R** (Table: Instruments which result in notional positions)) unless it is treated under **BIPRU 7.3.45R**.

Derivation of notional positions: Options

7.3.21 **R** If included in **BIPRU 7.3's PRR** calculation (see the table in **BIPRU 7.3.3R**), *options* must be treated as follows:

- (1) an *option* on a single *equity* must be treated as a notional *position* in that *equity*;
- (2) an *option* on a basket of *equities* or *equity* index must be treated as a *future* on that basket or index; and
- (3) an *option* on an *equity future* must be treated as:
 - (a) a long *position* in that *future*, for purchased call *options* and written put *options*; and
 - (b) a short *position* in that *future*, for purchased put *options* and written call *options*.

Deriving the net position in each equity

7.3.22 **R** The net *position* in each *equity* is the difference between the value of the *firm's* long *positions* (including notional *positions*) and the value of its short *positions* (including notional *positions*) in the same *equity*.

7.3.23 **R**

- (1) When deriving the net *position* in each *equity*, a *firm* must not net long and short *positions* except in accordance with this *rule*.
- (2) Subject to (3), a *firm* may net long and short *positions* in the same *equity*. Two *equities* are the same if and only if they:
 - (a) enjoy the same rights in all respects; and
 - (b) are fungible with each other.
- (3) Long and short *positions* in different tranches of the same *equity* may be treated as being in the same *equity* for the purpose of (1), where:

- (a) the tranches enjoy the same rights in all respects; and
- (b) the tranches become fungible with each other within 180 days, and thereafter the *equity* of one tranche can be delivered in settlement of the other tranche.

7.3.24 R A firm must not net a *reduced net underwriting position* with any other *equity position*.

7.3.25 G ■ BIPRU 7.3.24R only relates to *reduced net underwriting position*.

Simplified and standard equity methods

7.3.26 G ■ BIPRU 7.3.1R (1) requires that the net *position* in each *equity* be included in either the *simplified equity method* or the *standard equity method*, subject to the restriction in ■ BIPRU 7.3.27R. A firm does not have to use the same method for all *equities*.

7.3.27 R A firm must use the *simplified equity method* for *reduced net underwriting positions*.

7.3.28 G A firm may use either method for a *net underwriting position*; ■ BIPRU 7.3.27R only relates to *reduced net underwriting positions*.

Simplified equity method

7.3.29 R Under the *simplified equity method*, the *PRR* for each *equity*, *equity index*, or *equity basket* equals the market value of the net *position* (ignoring the sign) multiplied by the *appropriate position risk adjustment* from the table in ■ BIPRU 7.3.30R. The result must be converted into the *firm's base currency* at current spot *foreign currency rates*.

7.3.30 R Table: simplified equity method *position risk adjustments*

This table belongs to ■ BIPRU 7.3.29R

Instrument	<i>Position risk adjustment</i>
Single <i>equities</i>	16%
<i>Qualifying equity indices</i> (see BIPRU 7.3.38R)	8%
All other <i>equity indices</i> or baskets	16%

If it is necessary to distinguish between the *specific risk position risk adjustment* and the *general market risk position risk adjustment*, the *specific risk position risk adjustment* for the first and third rows is 8% and that for the second row is 0%. The rest of the *position risk adjustment* in the second column is the *general market risk position risk adjustment*

Standard equity method

7.3.31 G The *standard equity method* divides the risk of loss from a *firm's equity positions* into the risk of loss from a general move in a country's *equity market* and the risk of loss from an individual *equity's price changing*

relative to that country's equity market. These are called *general market risk* and *specific risk* respectively.

7.3.32 **R** Under the *standard equity method*, a firm must:

- (1) group *equity positions* into country portfolios as follows:
 - (a) a *position* in an individual *equity* belongs to:
 - (i) the country it is listed in;
 - (ii) any of the countries it is listed in, if more than one; or
 - (iii) the country it was issued from, if unlisted;
 - (b) a *position* in an *equity* basket or index that is treated under **■ BIPRU 7.3.15R(2)**, is allocated to one or more country portfolios based on the countries to which the underlying *equities* belong to under (a) or a notional country provided for in the table in **■ BIPRU 7.3.16R**; and
- (2) sum:
 - (a) the *PRRs* for *specific risk* calculated under **■ BIPRU 7.3.33R**; and
 - (b) the *PRRs* for *general market risk* for each country portfolio as calculated under **■ BIPRU 7.3.41R** and **■ BIPRU 7.3.42R**.

Standard equity method: Specific risk

7.3.33 **R** Under the *standard equity method*, a firm must calculate a *PRR* for *specific risk* based on the net *position* in each *equity*, *equity* index or *equity* basket by multiplying its market value (ignoring the sign) by the *appropriate position risk adjustment* from the table in **■ BIPRU 7.3.34R**.

7.3.34 **R** Table: *position risk adjustment* for specific risk under the standard equity method

This table belongs to **■ BIPRU 7.3.33R**

Instrument	Position risk adjustment
Qualifying equity indices (see BIPRU 7.3.38R)	0%
All equities, and other equity indices or equity baskets	8%

Definition of a qualifying equity

7.3.35 **R** [deleted]

7.3.36 **G** [deleted]

7.3.37 **G** [deleted]

Definition of a qualifying equity index

7.3.38 **R** A *qualifying equity index* is one which is traded on a *recognised investment exchange* or a *designated investment exchange* and:

- (1) is listed in the table in ■ BIPRU 7.3.39R; or
- (2) is not listed in the table in ■ BIPRU 7.3.39R, but is constructed in such a way that:
 - (a) it contains at least 20 *equities*;
 - (b) no single *equity* represents more than 20% of the total index; and
 - (c) no five *equities* combined represent more than 60% of the total index.

7.3.39 **R** Table: Qualifying equity indices

This table belongs to ■ BIPRU 7.3.38R

Country or territory	Name of index
Australia	All Ordinaries
Austria	Austrian Traded Index
Belgium	BEL 20
Canada	TSE 35, TSE 100, TSE 300
France	CAC 40, SBF 250
Germany	DAX
European	Dow Jones Stoxx 50 Index, FTSE Euro-top 300, MSCI Euro Index
Hong Kong	Hang Seng 33
Italy	MIB 30
Japan	Nikkei 225, Nikkei 300, TOPIX
Korea	Kospi
Netherlands	AEX
Singapore	Straits Times Index
Spain	IBEX 35
Sweden	OMX
Switzerland	SMI
UK	FTSE 100, FTSE Mid 250, FTSE All Share
US	S&P 500, Dow Jones Industrial Average, NASDAQ Composite, Russell 2000

Standard equity method: General market risk: General

7.3.40 **R** Under the *standard equity method*, a *firm* must apply approach one, as set out in ■ BIPRU 7.3.41R, to each country portfolio (or part portfolio) unless the conditions in ■ BIPRU 7.3.42R(3) are met, in which case the *firm* may instead apply approach two, as set out in ■ BIPRU 7.3.42R, to the relevant country portfolios (or part portfolios).

Standard equity method: General market risk: Approach One: No offset between different country portfolios

- 7.3.41 **R** Under approach one as referred to in ■ BIPRU 7.3.40R, the *PRR* for *general market risk* equals the net value (ignoring the sign) of the country portfolio multiplied by 8%.

Standard equity method: General market risk: Approach Two: Limited offset between different country portfolios

- 7.3.42 **R**
- (1) Under approach two as referred to in ■ BIPRU 7.3.40R, the *PRR* for *general market risk* is calculated using the following formula:

$$\sqrt{(8\% * CP_1)^2 + (8\% * CP_2)^2 + (8\% * CP_3)^2 + \dots + (8\% * CP_n)^2}$$
 - (2) In the formula in (1) CP_i denotes the net value of i th country portfolio (converted to the *firm's base currency* using current spot *foreign currency* rates).
 - (3) The conditions referred to in ■ BIPRU 7.3.40R that must be met for a *firm* to be able to use approach two as referred to in ■ BIPRU 7.3.40R are as follows:
 - (a) at least four country portfolios are included (that is: $n \geq 4$);
 - (b) only country portfolios for countries which are full members of the *OECD*, Hong Kong or Singapore are included;
 - (c) no individual country portfolio comprises more than 30% of the total gross value of country portfolios included; and
 - (d) the total net value of country portfolios included equals zero, that is:

$$\sum_{i=1}^n CP_i = 0$$

- 7.3.43 **G** In order to meet ■ BIPRU 7.3.42R(3)(d), it is likely that part of a country portfolio will have to be excluded from approach two under ■ BIPRU 7.3.42R (and therefore included in approach one under ■ BIPRU 7.3.41R), even if that country portfolio meets ■ BIPRU 7.3.42R(3)(a) - (c).

Basic interest rate calculation for equity instruments

- 7.3.44 **G** A *basic interest rate PRR* calculation is included in ■ BIPRU 7.3 for a *firm* that does not wish to use the calculation in ■ BIPRU 7.2 (Interest rate PRR). However, it tends to result in higher charges than the methods in ■ BIPRU 7.2, largely because the *interest rate PRR* is calculated on each notional *equity position* separately and then summed without offsetting long and short *positions*.
- 7.3.45 **R** This *rule* applies to a *firm* that does not include a *forward, future, option or swap* on an *equity, basket of equities or equity index* in the calculation of its *interest rate PRR* calculation under ■ BIPRU 7.2 (Interest rate PRR). However it does not apply to *cliquet* as defined in ■ BIPRU 7.6.18R (Table: Option PRR: methods for different types of option). A *firm* must calculate the *interest rate PRR* for a *position* being treated under this *rule* as follows:

- (1) multiply the market value of the notional *equity position* underlying the instrument by the appropriate percentage from the table in ■ BIPRU 7.3.47R; and
- (2) sum the results from (1), ignoring the sign.

7.3.46 G Cliquets on *equities*, baskets of *equities* or *equity* indices do not attract an *interest rate PRR*. ■ BIPRU 7.3.45R excludes them from the basic *interest rate PRR* calculation and the table in ■ BIPRU 7.2.4R (Table: Instruments which result in notional positions) excludes them from the scope of the *interest rate PRR* calculation in ■ BIPRU 7.2 (Interest rate PRR).

7.3.47 R Table: Percentages used in the basic interest rate PRR calculation for equity instruments

This table belongs to ■ BIPRU 7.3.45R(1)

Time to expiration	Percentage (%)
0 ≤ 3 months	0.20
> 3 ≤ 6 months	0.40
> 6 ≤ 12 months	0.70
> 1 ≤ 2 years	1.25
> 2 ≤ 3 years	1.75
> 3 ≤ 4 years	2.25
> 4 ≤ 5 years	2.75
> 5 ≤ 7 years	3.25
> 7 ≤ 10 years	3.75
> 10 ≤ 15 years	4.50
> 15 ≤ 20 years	5.25
> 20 years	6.00

Additional capital charge in relation to equity indices

7.3.48 R If a *firm* nets off *positions* in one or more of the *equities* constituting an *equity index future, forward* or *CFD* against one or more *positions* in the *equity index future, forward* or *CFD* itself, the *firm* must apply an additional *equity PRR* to the netted *position* to cover the risk of loss caused by the value of the *future, forward* or *CFD* not moving fully in line with that of its constituent *equities*. The same applies if a *firm* holds opposite *positions* in a *future, forward* or *CFD* on an *equity* index that are not identical in respect of either their maturity or their composition or both.

7.4 Commodity PRR

General rule

- 7.4.1** **R** A firm must calculate its *commodity PRR* by:
- (1) identifying which *commodity position* must be included within the scope of the *PRR* calculation (see ■ BIPRU 7.4.2R);
 - (2) expressing each such *position* in terms of the standard unit of measurement of the *commodity* concerned;
 - (3) expressing the spot price in each *commodity* in the *firm's base currency* at current spot foreign exchange rates;
 - (4) calculating an individual *PRR* for each *commodity* (see ■ BIPRU 7.4.20R); and
 - (5) summing the resulting individual *PRRs*.

Scope of the commodity PRR calculation

- 7.4.2** **R** A firm's *commodity PRR* calculation must, regardless of whether the *positions* concerned are *trading book* or *non-trading book positions*:
- (1) include *physical commodity positions*;
 - (2) (if the *firm* is the transferor of *commodities* or guaranteed rights relating to title to *commodities* in a *repurchase agreement* or the lender of *commodities* in a *commodities* lending agreement) include such *commodities*;
 - (3) include notional *positions* arising from *positions* in the instruments listed in the table in ■ BIPRU 7.4.4R; and
 - (4) exclude *positions* constituting a *stock financing* transaction.

- 7.4.3** **R** Gold *positions* are excluded from the scope of the *commodity PRR*. Instead, they are included within the scope of the foreign exchange *PRR* (■ BIPRU 7.5).

- 7.4.4** **R** Table: Instruments which result in notional positions
This table belongs to ■ BIPRU 7.4.2R(3)

Instrument	See
<i>Forwards, futures, CFDs, synthetic futures and options on a single commodity (unless the firm calculates a PRR on the option under BIPRU 7.6 (Option PRR))</i>	BIPRU 7.4.8R
A commitment to buy or sell a single commodity at an average of spot prices prevailing over some future period	BIPRU 7.4.10R
<i>Forwards, futures, CFDs, synthetic futures and options on a commodity index (unless the firm calculates an PRR on the option under BIPRU 7.6)</i>	BIPRU 7.4.13R - BIPRU 7.4.14R
<i>Commodity swaps</i>	BIPRU 7.4.16R - BIPRU 7.4.17R
A warrant relating to a commodity must be treated as an option on a commodity.	

- 7.4.5 **G** ■ BIPRU 7.4.2R includes a *trading book position* in a commodity that is subsequently repo'd under a *repurchase agreement* or lent under a stock lending agreement. Clearly, if the commodity had initially been obtained via a *reverse repurchase agreement* or stock borrowing agreement, the commodity would not have been included in the *trading book* in the first place.
- 7.4.6 **G** Firms are reminded that the table in ■ BIPRU 7.6.5R (Table: Appropriate PRR calculation for an option or warrant) divides *commodity options* into:
 - (1) those which must be treated under ■ BIPRU 7.6; and
 - (2) those which must be treated under either ■ BIPRU 7.4 or ■ BIPRU 7.6 (Option PRR), the firm being able to choose whether ■ BIPRU 7.4 or ■ BIPRU 7.6 is used.

Derivation of notional positions: General

- 7.4.7 **G** ■ BIPRU 7.4.8R - ■ BIPRU 7.4.19G convert the instruments listed in the table in ■ BIPRU 7.4.4R into notional *positions* in the relevant *commodities*. These notional *positions* are expressed in terms of quantity (tonnes, barrels, etc), not value. The maturity of the *position* is only relevant where the firm is using the *commodity maturity ladder approach* or the *commodity extended maturity ladder approach*.

Derivation of notional positions: Futures, forwards, CFDs and options on a single commodity

- 7.4.8 **R** Where a *forward, future, CFD, synthetic future or option* (unless already included in the firm's *option PRR* calculation) settles according to:
 - (1) the difference between the price set on trade date and that prevailing at contract expiry, the notional *position*:
 - (a) equals the total quantity underlying the contract; and

7.4.9

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- (b) has a maturity equal to the expiry date of the contract; and
- (2) the difference between the price set on trade date and the average of prices prevailing over a certain period up to contract expiry, there is a notional *position* for each of the reference dates used in the averaging period to calculate the average price, which:
 - (a) equals a fractional share of the total quantity underlying the contract; and
 - (b) has a maturity equal to the relevant reference date.
- (1) The following example illustrates ■ BIPRU 7.4.8R (2).
- (2) A *firm* buys a Traded Average Price Option (TAPO - a type of Asian option) allowing it to deliver 100 tonnes of Grade A copper and receive \$1,750 in June. If there were 20 *business days* in June the short notional *positions* will each:
 - (a) equal 5 tonnes per day (1/20 of 100 tonnes); and
 - (b) have a maturity equal to one of the *business days* in June (one for each day).
- (3) In this example as each *business day* in June goes by the quantity per day for the remaining days does not change (5 tonnes per day) only the days remaining changes. Therefore, halfway through June there are ten, 5 tonne short notional *positions* remaining each for the ten remaining *business days* in June.

7.4.10

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Derivation of notional positions: Buying or selling a single commodity at an average of spot prices prevailing in the future

Commitments to buy or sell at the average spot price of the *commodity* prevailing over some period between trade date and maturity must be treated as a combination of:

- (1) a *position* equal to the full amount underlying the contract with a maturity equal to the maturity date of the contract which is:
 - (a) long, where the *firm* will buy at the average price; or
 - (b) short, where the *firm* will sell at the average price; and
- (2) a series of notional *positions*, one for each of the reference dates where the contract price remains unfixed, each of which:
 - (a) is long if the *position* under (1) is short, or short if the *position* under (1) is long;
 - (b) equals a fractional share of the total quantity underlying the contract; and
 - (c) has a maturity date of the relevant reference date.

7.4.11

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The following guidance provides an example of ■ BIPRU 7.4.10R. In January, a *firm* agrees to buy 100 tonnes of copper for the average spot price prevailing during the 20 *business days* in February, and will settle on 30 June. After entering into this agreement, the *firm* faces the risk that the average price

for February increases relative to that for 30 June. Therefore, as highlighted in the table below:

- (1) the short *positions* reflect the fact that this could occur because any one of the remaining forward prices for February increase; and
- (2) the long *position* reflects the fact that this loss could occur because the forward price for 30 June falls.

7.4.12 G Table: Example of buying at the average spot price prevailing in the future
This table belongs to ■ BIPRU 7.4.11G

	Application of BIPRU 7.4.10R(1)	Application of BIPRU 7.4.10R(2)
From trade date to start of averaging period	Long <i>position</i> in 100 tonnes of copper with a maturity of 30 June.	A series of 20 notional short <i>positions</i> each equal to 5 tonnes of copper. Each <i>position</i> is allocated a maturity equal to one of the <i>business days</i> in February (one for each day).
During averaging period	Long <i>position</i> in 100 tonnes of copper with a maturity of 30 June.	As each <i>business day</i> goes by in February the price for 5 tonnes of copper is fixed and so there will be one less notional short <i>position</i> .
After averaging period	Long <i>position</i> in 100 tonnes of copper with a maturity of 30 June.	No short <i>positions</i> .

Derivation of notional positions: CFDs and options on a commodity index

7.4.13 R *Commodity index futures and commodity index options* (unless the *option* is included in the *firm's option PRR* calculation), must be treated as follows:

- (1) Step 1: the total quantity underlying the contract must be either:
 - (a) treated as a single notional *commodity position* (separate from all other *commodities*); or
 - (b) divided into notional *positions*, one for each of the constituent *commodities* in the index, of an amount which is a proportionate part of the total underlying the contract according to the weighting of the relevant *commodity* in the index;
- (2) Step 2: each notional *position* determined in Step 1 must then be included:
 - (a) when using the *commodity simplified approach* (■ BIPRU 7.4.24R), without adjustment; or
 - (b) when using the *commodity maturity ladder approach* (■ BIPRU 7.4.25R) or the *commodity extended maturity ladder approach* (■ BIPRU 7.4.32R), with the adjustments in ■ BIPRU 7.4.14R.

7.4.14 **R** Table: Treatment of commodity index futures and commodity index options

This table belongs to ■ BIPRU 7.4.13R(2)(b)

Construction of index	Notional <i>position</i> (or <i>positions</i>) and maturity
Spot level of index is based on the spot price of each constituent <i>commodity</i>	Each quantity determined in Step 1 as referred to in BIPRU 7.4.13R is assigned a maturity equal to the expiry date of the contract.
Spot level of index is based on an average of the forward prices of each constituent <i>commodity</i>	Each quantity determined in Step 1 as referred to in BIPRU 7.4.13R is divided (on a pro-rata basis) into a series of forward <i>positions</i> to reflect the impact of each forward price on the level of the index. The maturity of each forward <i>position</i> equals the maturity of the relevant forward price determining the level of the index when the contract expires.

- 7.4.15 **G**
- (1) An example of using ■ BIPRU 7.4.13R and the table in ■ BIPRU 7.4.14R is as follows.
 - (2) A *firm* is long a three-month *commodity index future* where the spot level of the index is based on the one, two and three month forward prices of aluminium, copper, tin, lead, zinc and nickel (18 prices in total).
 - (3) Step 1: the *firm* should decide whether to treat the full quantity underlying the contract as a single notional *commodity position* or disaggregate it into notional *positions* in aluminium, copper, tin, lead, zinc and nickel. In this case the *firm* decides to disaggregate the contract into notional *positions* in aluminium, copper, tin, lead, zinc and nickel.
 - (4) Step 2: if the *firm* uses the *commodity simplified approach*, nothing more need be done to arrive at the notional *position*. In this case the *firm* uses the *commodity maturity ladder approach* and so subdivides each *position* in each metal into three because the level of the index is based on the prevailing one, two and three month forward prices. Since the *future* will be settled in three months' time at the prevailing level of the index, the three *positions* for each metal will have maturities of four, five and six months respectively.

Derivation of notional positions: Commodity swaps

7.4.16 **R** A *firm* must treat a *commodity swap* as a series of notional *positions*, one *position* for each payment under the *swap*, each of which:

- (1) equals the total quantity underlying the contract;
- (2) has a maturity corresponding to the payment date; and
- (3) is long or short according to ■ BIPRU 7.4.17R.

7.4.17 **R** Table: Treatment of commodity swaps

This table belongs to ■ BIPRU 7.4.16R

	Receiving amounts which are unrelated to any commodity's price	Receiving the price of commodity 'b'
Paying amounts which are unrelated to any commodity's price	N/A	Long positions in commodity 'b'
Paying the price of commodity 'a'	Short positions in commodity 'a'	Short positions in commodity 'a' and long positions in commodity 'b'

7.4.18 **G** The table in ■ BIPRU 7.4.17R shows that where the legs of the *swap* are in different *commodities*, a series of forward *positions* are created for each *commodity* (that is, a series of short *positions* in *commodity* 'a' and a series of long *positions* in *commodity* 'b').

7.4.19 **G** The table in ■ BIPRU 7.4.17R also covers the case where one leg is unrelated to any *commodity's* price. This leg may be subject to a *PRR* under another part of ■ BIPRU 7; for example, an interest rate based leg would have to be included in a *firm's interest rate PRR* calculation.

Calculating the PRR for each commodity: General

7.4.20 **R** A *firm* must calculate a *commodity PRR* for each *commodity* separately using either the *commodity simplified approach* (■ BIPRU 7.4.24R), the *commodity maturity ladder approach* (■ BIPRU 7.4.25R) or the *commodity extended maturity ladder approach* (■ BIPRU 7.4.32R).

7.4.21 **R** A *firm* must use the same approach for a particular *commodity* but need not use the same approach for all *commodities*.

7.4.22 **R**

- (1) A *firm* must treat *positions* in different grades or brands of the same *commodity-class* as different *commodities* unless they:
 - (a) can be delivered against each other; or
 - (b) are close substitutes and have price movements which have exhibited a stable correlation coefficient of at least 0.9 over the last 12 months.
- (2) If a *firm* relies on (1)(b) it must then monitor compliance with the conditions in that paragraph on a continuing basis.

7.4.23 **R** If a *firm* intends to rely on the approach in ■ BIPRU 7.4.22R(1)(b):

- (1) it must notify the *appropriate regulator* in writing at least 20 *business days* prior to the date the *firm* starts relying on it; and
- (2) the *firm* must, as part of the notification under (1), provide to the *appropriate regulator* the analysis of price movements on which it relies.

Calculating the PRR for each commodity: Simplified approach

7.4.24

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A firm which calculates a commodity PRR using the commodity simplified approach must do so by summing:

- (1) 15% of the net *position* multiplied by the spot price for the commodity; and
- (2) 3% of the gross *position* (long plus short, ignoring the sign) multiplied by the spot price for the commodity;

(and for these purposes the excess of a firm's long (short) *positions* over its short (long) *positions* in the same commodity (including notional *positions* under ■ BIPRU 7.4.4R) is its net *position* in each commodity).

Calculating the PRR for each commodity: Maturity ladder approach

7.4.25

R

A firm using the commodity maturity ladder approach must calculate the commodity PRR following the steps in ■ BIPRU 7.4.26R and then sum all spread charges, carry charges and outright charges that result. A firm must use a separate maturity ladder for each commodity.

7.4.26

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- (1) A firm must calculate the charges referred to in ■ BIPRU 7.4.25R as follows.
- (2) Step 1: offset long and short *positions* maturing:
 - (a) on the same day; or
 - (b) (in the case of *positions* arising under contracts traded in markets with daily delivery dates) within 10 *business days* of each other.
- (3) Step 2: allocate the *positions* remaining after step 1 to the appropriate maturity band in the table in ■ BIPRU 7.4.28R (*physical commodity positions* are allocated to band 1).
- (4) Step 3: match long and short *positions* within each band. In each instance, calculate a spread charge equal to the matched amount multiplied first by the spot price for the commodity and then by the spread rate of 3%.
- (5) Step 4: carry unmatched *positions* remaining after step 3 to another band where they can be matched, then match them. Do this until all matching possibilities are exhausted. In each instance, calculate:
 - (a) a carry charge equal to the carried *position* multiplied by the spot price for the commodity, the carry rate of 0.6% and the number of bands by which the *position* is carried; and
 - (b) a spread charge equal to the matched amount multiplied by the spot price for the commodity and the spread rate of 3%.
- (6) Step 5: calculate the outright charge on the remaining *positions* (which will either be all long *positions* or all short *positions*). The outright charge equals the remaining *position* (ignoring the sign) multiplied by the spot price for the commodity and the outright rate of 15%.

7.4.27 **G** The matched amount in **■ BIPRU 7.4.26R** is the lesser (ignoring the sign) of either the total long *position* or the total short *position*. For example, a band with 1000 long and 700 short results in a matched amount of 700. The unmatched amount would be 300.

7.4.28 **R** Table: Maturity bands for the maturity ladder approach

This table belongs to **■ BIPRU 7.4.26R**

Band	Maturity of <i>position</i>
Band 1	0 ≤ 1 month
Band 2	> 1 month ≤ 3 months
Band 3	> 3 months ≤ 6 months
Band 4	> 6 months ≤ 1 year
Band 5	> 1 year ≤ 2 years
Band 6	> 2 years ≤ 3 years
Band 7	> 3 years

7.4.29 **G** **■ BIPRU 7.4.30G** is an example illustrating the calculation of the *commodity PRR* on an individual *commodity* using the *commodity maturity ladder approach* (**■ BIPRU 7.4.26R**). After the *firm* has carried out the pre-processing required by **■ BIPRU 7.4.26R(2)** (that is, step 1), it follows steps 2 to 5 as shown below. Because the *firm* is using the *commodity maturity ladder approach* the spread rate is 3%, the carry rate is 0.6% and the outright rate is 15%. The example assumes that the spot price for the *commodity* is £25.

7.4.30 **G** Table: Example illustrating the commodity maturity ladder approach

This table belongs to **■ BIPRU 7.4.29G**

Band	Step 2 Allocate remaining <i>positions</i> to appropriate maturity bands	Step 3 Match within bands. Each matched amount incurs a spread charge.	Step 4a Carry across bands. Each carried amount incurs a carry charge.	Step 4b Match within band. Each matched amount incurs a spread charge.	Step 6 Remaining <i>position(s)</i> incur an outright charge.
0 ≤ 1 month					
>1 month ≤ 3 months	1000 long 700 short	700 matched	300 carried		
>3 months ≤ 6 months					
>6 months ≤ 1 year					
>1 year ≤ 2 years	600 short	Nothing matched	100 carried	400 matched	200 short remains
>2 years ≤ 3 years					
> 3 years	100 long	Nothing matched			
Spread charges	700*£25*3% + 400*£25*3%			=	£825
Carry charges	300*£25*0.6%*3 + 100*£25*0.6%*2			=	£165
Outright charge	200*£25*15%			=	£750
					£1740

Calculating the PRR for each commodity: Extended maturity ladder approach

7.4.31 **R** A firm may use the commodity extended maturity ladder approach to calculate the commodity PRR for a particular commodity provided the firm:

- (1) has a diversified commodities portfolio;
- (2) undertakes significant commodities business;
- (3) is not yet in a position to use the VaR model approach to calculate commodity PRR; and
- (4) at least twenty business days before the date the firm uses that approach notifies the appropriate regulator in writing of:
 - (a) its intention to use the commodity extended maturity ladder approach; and
 - (b) the facts and matters relied on to demonstrate that the firm meets the criteria in (1) - (3).

7.4.32 **R** A firm using the commodity extended maturity ladder approach must calculate its commodity PRR by:

- (1) following the same steps as in ■ BIPRU 7.4.26R but using the rates from the table in ■ BIPRU 7.4.33R rather than those in ■ BIPRU 7.4.26R; and
- (2) summing all spread charges, carry charges and outright charge that result.

7.4.33 **R** Table: Alternative spread, carry and outright rates

This table belongs to ■ BIPRU 7.4.32R

	Precious metals (excluding gold)	Base metals	Softs (agricultural)	Other (including energy)
Spread rate (%)	2	2.4	3	3
Carry rate (%)	0.3	0.5	0.6	0.6
Outright rate (%)	8	10	12	15

7.4.34 **G** For the purposes of ■ BIPRU 7.4.31R(1) a firm has a diversified commodity portfolio where it holds positions in more than one commodity in each of the categories set out in the table in ■ BIPRU 7.4.33R and holds positions across different maturities in those individual commodities. A firm would not have a diversified commodity portfolio if it held positions in only one commodity in each of the categories set out in the table in ■ BIPRU 7.4.33R. This is because the rates in the table in ■ BIPRU 7.4.33R assume firms have positions in more than one of that category's commodities. Different commodities within a given category are likely to exhibit different volatilities, so where a firm does not have a diversified commodity portfolio

in that category, the rates applying to that category might underestimate the regulatory capital required for a certain *commodity* at certain times.

7.4.35 **G** What constitutes significant business in **■ BIPRU 7.4.31R(2)** will vary from *firm* to *firm*. The more regularly the *firm* undertakes trades in *commodities* and the more consistently it has *positions* in the relevant *commodity*, the more likely it is to be undertaking significant business for the purposes of **■ BIPRU 7.4.31R(2)**.

7.4.36 **R** Where a *firm* is:

- (1) treating a *commodity index derivative* as if it was based on a single separate *commodity* (see **■ BIPRU 7.4.13R(1)(a)**); and
- (2) using the *commodity extended maturity ladder approach* to calculate the *commodity PRR* for that *commodity*;

it must determine which index constituent incurs the highest rate in the table in **■ BIPRU 7.4.33R** and apply that rate to the notional *position* for the purposes of **■ BIPRU 7.4.32R**.

7.4.37 **G** Where an index is only based on precious metals, **■ BIPRU 7.4.13R** and **■ BIPRU 7.4.36R** allow the *firm* to treat the single notional *position* as precious metal for the purposes of **■ BIPRU 7.4.32R**. However, if the index contained a mix of precious metals and base metals the *firm* would have to treat the notional *position* under **■ BIPRU 7.4.36R** as a base metal because base metals attract a higher rate than precious metals in the table in **■ BIPRU 7.4.33R**.

Liquidity and other risks

7.4.38 **R** If a short *position* to which **■ BIPRU 7.4** applies falls due before a long *position* to which **■ BIPRU 7.4** applies, a *firm* must also guard against the risk of a shortage of liquidity which may exist in some markets.

7.4.39 **G** In particular, where **■ BIPRU 7.4.38R** applies and the short *position* constitutes a material *position* compared to a *firm's* total *commodity positions*, it should consider a further *commodity PRR* charge in respect of that *position* depending on the likelihood of a shortage of liquidity in that market.

7.4.40 **R** A *firm* must safeguard against other risks, apart from the delta risk, associated with *commodity options*.

7.4.41 **R** The interest-rate and foreign-exchange risks not covered by other provisions of **■ BIPRU 7.4** or by the provisions of **■ BIPRU 7.2** (Interest rate PRR) or **■ BIPRU 7.5** (Foreign currency PRR) must be included in the calculation of *general market risk* for traded debt *securities* and in the calculation of *foreign currency PRR*.

7.5 Foreign currency PRR

General rule

7.5.1

R

A firm must calculate its *foreign currency PRR* by:

- (1) identifying which *foreign currency* and *gold positions* to include in the *PRR* calculation;
- (2) calculating the net *open position* in each currency in accordance with this section (including where necessary the *base currency* calculated in the same way as it is for *foreign currencies*) and in gold;
- (3) calculating the *open currency position* for *foreign currencies* as calculated under ■ BIPRU 7.5.19R and the net gold position (see ■ BIPRU 7.5.20R); and
- (4) multiplying the sum of the absolutes of that *open currency position* and that net *gold position* by 8%.

7.5.2

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An example of the operation of ■ BIPRU 7.5.1R is as follows. A firm has an *open currency position* of £100 and a net *gold position* of £50. The sum (ignoring the sign) is £150, and so the *foreign currency PRR* is £12.

Scope of the foreign currency PRR calculation

7.5.3

R

A firm's *foreign currency PRR* calculation must include the following items regardless of whether they are *trading book* or *non-trading book positions*:

- (1) all *gold positions*;
- (2) all *spot positions* in *foreign currency* (that is, all *asset items* less all *liability items*, including *accrued interest*, in the *foreign currency* in question);
- (3) all *forward positions* in *foreign currency*;
- (4) all *CRD financial instruments* and other items which are denominated in a *foreign currency*;
- (5) *irrevocable guarantees* (and similar instruments) that are certain to be called and likely to be irrecoverable to the extent they give rise to a *position* in *gold* or *foreign currency*; and
- (6) *notional positions* arising from the instruments listed in the table in ■ BIPRU 7.5.5R.

7.5.4

R

- (1) The following are excluded from a *firm's foreign currency PRR* calculation:
- (a) *foreign currency assets* which have been deducted in full from the *firm's capital resources* under the calculations under the *capital resources table*;
 - (b) *positions* hedging (a);
 - (c) *positions* that a *firm* has deliberately taken in order to hedge against the adverse effect of the exchange rate on the ratio of its *capital resources* to its *capital resources requirement*; and
 - (d) transactions to the extent that they fully hedge net future *foreign currency* income or expenses which are known but not yet accrued.
- (2) If a *firm* uses an exclusion under (1) it must:
- (a) notify the *appropriate regulator* before it makes use of it;
 - (b) include in the notification in (a) the terms on which the relevant item will be excluded;
 - (c) not change the terms of the exclusion under (b); and
 - (d) document its policy on the use of that exclusion in its *trading book policy statement*.
- (3) A *position* may only be excluded under (1)(b) or (c) if it is of a non-trading or structural nature.

7.5.5

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Table: instruments which result in notional foreign currency positions

This table belongs to ■ BIPRU 7.5.3R(6).

Instruments	See
<i>Foreign currency futures, forwards, synthetic futures and CFDs</i>	BIPRU 7.5.11R
<i>Foreign currency swaps</i>	BIPRU 7.5.13R
<i>Foreign currency options or warrants</i> (unless the <i>firm</i> calculates a <i>PRR</i> on the <i>option</i> or <i>warrant</i> under BIPRU 7.6 (Option PRR)).	BIPRU 7.5.15R
<i>Gold futures, forwards, synthetic futures and CFDs</i>	BIPRU 7.5.16R
<i>Gold options</i> (unless the <i>firm</i> calculates a <i>PRR</i> on the <i>option</i> under BIPRU 7.6).	BIPRU 7.5.17R
<i>Positions in CIUs</i>	BIPRU 7.5.18R

7.5.6

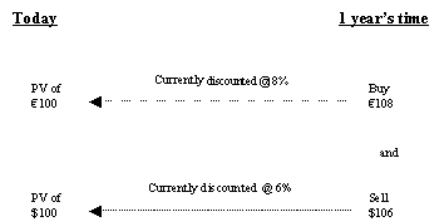
G

Firms are reminded that the table in ■ BIPRU 7.6.5R (Table: Appropriate PRR calculation for an option or warrant) divides *foreign currency options* and *warrants* into:

- (1) those which must be treated under ■ BIPRU 7.6 (Option PRR); and

- (2) those which must be treated under either ■ BIPRU 7.5 or ■ BIPRU 7.6, the *firm* being able to choose whether ■ BIPRU 7.5 or ■ BIPRU 7.6 is used.

- 7.5.7 **R** When determining the currency of denomination *firms* must:
- (1) use the currency in which the *firm* accounts for the instrument where an instrument is quoted in more than one currency; and
 - (2) treat depository receipts as *positions* in the underlying *security*.
- 7.5.8 **G** Instruments denominated in a foreign currency include, amongst other things, assets and liabilities (including accrued interest); *non-foreign currency derivative*; *net underwriting positions*; *reduced net underwriting positions*; and irrevocable guarantees (or similar instruments) that are certain to be called.
- 7.5.9 **R** Where a contract is based on a basket of currencies, the *firm* can choose either to derive notional *positions* in each of the constituent currencies or treat it as a single notional *position* in a separate notional currency.
- Derivation of notional positions: General**
- 7.5.10 **G** ■ BIPRU 7.5.11R - ■ BIPRU 7.5.18R derive notional currency *positions* for the instruments listed in the table in ■ BIPRU 7.5.5R.
- Derivation of notional positions: Foreign exchange forwards, futures, CFDs and synthetic futures**
- 7.5.11 **R**
- (1) A *firm* must treat a *foreign currency forward, future, synthetic future* or *CFD* as two notional currency *positions* as follows:
 - (a) a long notional *position* in the currency which the *firm* has contracted to buy; and
 - (b) a short notional *position* in the currency which the *firm* has contracted to sell.
 - (2) In (1) the notional *positions* have a value equal to either:
 - (a) the contracted amount of each currency to be exchanged in the case of a *forward, future, synthetic future* or *CFD* held in the *non-trading book*; or
 - (b) the present value of the amount of each currency to be exchanged in the case of a *forward, future, synthetic future* or *CFD* held in the *trading book*.
- 7.5.12 **G**
- (1) The following example illustrates ■ BIPRU 7.5.11R. In this example, a *firm* contracts to sell \$106 for €108 in one year's time and the present values of each cash flow are \$100 and €100 respectively.



- (2) In the *non-trading book*, this *forward* would be treated as a combination of a €108 long *position* and a \$106 short *position*.
- (3) In the *trading book*, this *forward* would be treated as a combination of a €100 long *position* and a \$100 short *position*.
- (4) *Firms* are reminded that *foreign currency forwards* held in the *trading book* should also be included in the *firm's interest rate PRR* calculation (see ■ BIPRU 7.2.4R (Instruments which result in notional *positions* for the purpose of the *interest rate PRR*)).

Derivation of notional positions: Foreign currency swaps

7.5.13

R

- (1) A *firm* must treat a *foreign currency swap* as:
 - (a) a long notional *position* in the currency in which the *firm* has contracted to receive interest and principal; and
 - (b) a short notional *position* in the currency in which the *firm* has contracted to pay interest and principal.
- (2) In (1) the notional *positions* have a value equal to either:
 - (a) the nominal amount of each currency underlying the *swap* if it is held in the *non-trading book*; or
 - (b) the present value amount of all cash flows in the relevant currency in the case of a *swap* held in the *trading book*.

7.5.14

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- (1) The following example illustrates ■ BIPRU 7.5.13R. In this example a *firm* enters into a five year *foreign currency swap* where it contracts to pay six month US\$ Libor on \$100 in return for receiving 6% fixed on €100. The present values of each leg are \$100 and €98 respectively.
- (2) In the *non-trading book*, this *swap* would be treated as a combination of a €100 long *position* and a \$100 short *position*.
- (3) In the *trading book*, this *swap* would be treated as a combination of a €98 long *position* and a \$100 short *position*.
- (4) *Firms* are reminded that *foreign currency swaps* held in the *trading book* should also be included in the *firm's interest rate PRR* calculation (see ■ BIPRU 7.2.4R (Instruments which result in notional *positions* for the purpose of the *interest rate PRR*)).

Derivation of notional positions: Foreign currency options and warrants

- 7.5.15 **R** Where included in ■ BIPRU 7.5's *PRR* calculation (see the table in ■ BIPRU 7.5.5R), a *foreign currency option* or *warrant* must be treated as a *foreign currency forward*.

Derivation of notional positions: Gold forwards, futures, synthetic futures and CFDs

- 7.5.16 **R** A *forward*, *future*, *synthetic future* or *CFD* on gold must be treated as a *notional position* in gold with a value equal to the amount of gold underlying multiplied by the current spot price for gold.

Derivation of notional positions: Gold options

- 7.5.17 **R** If included in the *PRR* calculation under ■ BIPRU 7.5 (see the table in ■ BIPRU 7.5.5R), a *gold option* must be treated as a *gold forward*.

Derivation of notional positions: CIUs

- 7.5.18 **R**
- (1) This *rule* deals with *positions* in *CIUs*.
 - (2) The actual *foreign currency positions* of a *CIU* must be included in a *firm's foreign currency PRR* calculation under ■ BIPRU 7.5.1 R.
 - (3) A *firm* may rely on third party reporting of the *foreign currency positions* in the *CIU*, where the correctness of this report is adequately ensured.
 - (4) If a *firm* is not aware of the *foreign currency positions* in a *CIU*, the *firm* must assume that the *CIU* is invested up to the maximum extent allowed under the *CIUs* mandate in *foreign currency* and the *firm* must, for *trading book positions*, take account of the maximum indirect exposure that it could achieve by taking leveraged *positions* through the *CIU* when calculating its *foreign currency PRR*. This must be done by proportionally increasing the *position* in the *CIU* up to the maximum exposure to the underlying investment items resulting from the investment mandate.
 - (5) The assumed *position* of the *CIU* in *foreign currency* calculated in accordance with ■ BIPRU 7.5.18R(4) must be treated as a separate currency according to the treatment of investments in gold, subject to the modification that, if the direction of the *CIUs* investment is available, the total long *position* may be added to the total long open *foreign currency position* and the total short *position* may be added to the total short open *foreign currency position*. No netting is allowed between such *positions* prior to this calculation.

Open currency position

- 7.5.19 **R** A *firm* must calculate its *open currency position* by:
- (1) calculating the net *position* in each *foreign currency*;

- (2) converting each such net *position* into its *base currency* equivalent at current spot rates;
- (3) summing all short net *positions* and summing all long net *positions* calculated under (1) and (2); and
- (4) selecting the larger sum (ignoring the sign) from (3).

Net gold position

7.5.20

R

A *firm* must calculate its net gold *position* by:

- (1) valuing all gold *positions* using the prevailing spot price for gold (regardless of the maturity of the *positions*);
- (2) offsetting long and short *positions*; and
- (3) converting the resulting net *position* into the *base currency* equivalent using the current spot *foreign currency* rate.

7.6 Option PRR

Option PRR calculation

- 7.6.1** **R** A firm must calculate its *option PRR* by:
- (1) identifying which *option positions* must be included within the scope of the *option PRR* calculation under ■ BIPRU 7.6.3R - ■ BIPRU 7.6.5R;
 - (2) calculating the derived *position* in each *option* in accordance with ■ BIPRU 7.6.9R - ■ BIPRU 7.6.15R;
 - (3) calculating the *PRR* for each derived *position* in accordance with ■ BIPRU 7.6.16R - ■ BIPRU 7.6.31R;
 - (4) summing all of the *PRRs* calculated in accordance with (3).
- 7.6.2** **G** Firms are reminded that the table in ■ BIPRU 7.2.4R (Instruments which result in notional *positions* for the purposes of the *interest rate PRR*) and the table in ■ BIPRU 7.3.3R (Instruments which result in notional *positions* for the purposes of the *equity PRR*) also require an *interest rate PRR* to be calculated for *options* on *equities*, baskets of *equities* or *equities* indices. The interaction between ■ BIPRU 7.6 and the rest of Chapter 7 is illustrated in ■ BIPRU 7.6.33G.
- ### Scope of the option PRR calculation
- 7.6.3** **R** Except as permitted under ■ BIPRU 7.6.5R, a firm's *option PRR* calculation must include:
- (1) each *trading book position* in an *option* on an *equity*, interest rate or debt security;
 - (2) each *trading book position* in a *warrant* on an *equity* or debt security;
 - (3) each *trading book position* in a *CIU*; and
 - (4) each *trading book* and *non-trading book position* in an *option* on a *commodity*, currency or gold.
- 7.6.4** **G** ■ BIPRU 7.6.3R(2) includes *net underwriting positions* or *reduced net underwriting positions* in *warrants*.

7.6.5

R

Table: Appropriate PRR calculation for an option or warrant

This table belongs to ■ BIPRU 7.6.3R

Option type (see BIPRU 7.6.18R) or warrant	PRR calculation
American <i>option</i> , European <i>option</i> , Bermudan <i>option</i> , Asian <i>option</i> or <i>warrant</i> for which the <i>in the money</i> percentage (see BIPRU 7.6.6R) is equal to or greater than the <i>appropriate position risk adjustment</i> (see BIPRU 7.6.7R and BIPRU 7.6.8R)	Calculate either an <i>option PRR</i> , or the most appropriate to the underlying <i>position</i> of: (a) an <i>equity PRR</i> ; or (b) an <i>interest rate PRR</i> ; or (c) a <i>commodity PRR</i> ; or (d) a <i>foreign currency PRR</i> ; or (e) a <i>collective investment undertaking PRR</i> .
American <i>option</i> , European <i>option</i> , Bermudan <i>option</i> , Asian <i>option</i> or <i>warrant</i> : (a) for which the <i>in the money</i> percentage (see BIPRU 7.6.6R) is less than the <i>appropriate position risk adjustment</i> (see BIPRU 7.6.7R and BIPRU 7.6.8R); or (b) that is <i>at the money</i> ; or (c) that is <i>out of the money</i> .	Calculate an <i>option PRR</i>
All other types of <i>option</i> listed in BIPRU 7.6.18R (regardless of whether <i>in the money</i> , <i>at the money</i> or <i>out of the money</i>).	

The in the money percentage

7.6.6

R

- (1) The *in the money* percentage is calculated in accordance with this rule.
- (2) For a call *option*:

$$\frac{\text{Current market price of underlying} - \text{Strike price of the option}}{\text{Strike price of the option}} * 100$$
- (3) For a put *option*:

$$\frac{\text{Strike price of option} - \text{Current market price of underlying}}{\text{Strike price of the option}} * 100$$
- (4) In the case of an *option* on a basket of *securities* a *firm* may not treat the *option* as being *in the money* by the relevant percentage so as to enable the *firm* not to apply an *option PRR* under ■ BIPRU 7.6.5R unless the conditions in ■ BIPRU 7.6.5R are satisfied with respect to each kind of underlying investment.
- (5) (4) also applies to an *option* on a *CIU* if a *firm* is using one of the *CIU look through methods*.

The appropriate position risk adjustment

7.6.7

R

- (1) The *appropriate position risk adjustment* for a *position* is that listed in the table in ■ BIPRU 7.6.8R against the relevant underlying *position*.

- (2) If the *firm* uses the *commodity extended maturity ladder approach* or the *commodity maturity ladder approach* for a particular *commodity* under ■ BIPRU 7.4 (Commodity PRR) the *appropriate position risk adjustment* for an *option* on that *commodity* is the outright rate applicable to the underlying *position* (see ■ BIPRU 7.4.26R (Calculating the PRR for each commodity: Maturity ladder approach) and ■ BIPRU 7.4.33R (Table: Alternative spread, carry and outright rates)).
- (3) If a *firm* does not have *commodity positions* treated under ■ BIPRU 7.4 or does not have *positions* in the *commodity* in question treated under ■ BIPRU 7.4 the restrictions in ■ BIPRU 7.4 that regulate when a *firm* can and cannot use a particular method of calculating the *commodity PRR* apply for the purpose of establishing the *appropriate position risk adjustment* for the purposes of ■ BIPRU 7.6.
- (4) If a *firm* is using one of the *CIU look through methods* for an *option* on a *CIU* the leveraging requirements in ■ BIPRU 7.7 (Position risk requirements for collective investment undertakings) apply (see ■ BIPRU 7.7.11R). For this purpose the amount of the *appropriate position risk adjustments* under ■ BIPRU 7.6.6R(5) is increased by the amount of that leveraging (expressed as a percentage) as calculated under ■ BIPRU 7.7, subject to a maximum *appropriate position risk adjustment* of 32%.

7.6.8

R Table: Appropriate position risk adjustment

This table belongs to ■ BIPRU 7.6.7R

<i>Underlying position</i>	<i>Appropriate position risk adjustment</i>
<i>Equity</i>	The <i>position risk adjustment</i> applicable to the underlying <i>equity</i> or <i>equity index</i> in the table in BIPRU 7.3.30R (Simplified equity method)
<i>Interest rate</i>	The sum of the <i>specific risk position risk adjustment</i> (see BIPRU 7.2.43R to BIPRU 7.2.51G (Specific risk calculation)) and the <i>general market risk position risk adjustment</i> (as set out in BIPRU 7.2.57R (General market risk position risk adjustments)) applicable to the underlying <i>position</i>
<i>Debt securities</i>	The sum of the <i>specific risk position risk adjustment</i> (see BIPRU 7.2.43R to BIPRU 7.2.51G (Specific risk calculation)) and the <i>general market risk position risk adjustment</i> (as set out in the table in BIPRU 7.2.57R (General market risk position risk adjustments)) applicable to the underlying <i>position</i>
<i>Commodity</i>	18% (unless BIPRU 7.6.7R requires otherwise)
<i>Currency</i>	8%
<i>Gold</i>	8%
<i>CIU</i>	32% (subject to BIPRU 7.6.6R and BIPRU 7.6.7R)

Calculating derived positions

7.6.9 **R** A firm must calculate the derived position specified in the table in ■ BIPRU 7.6.13R for each position included in its option PRR calculation.

Netting positions

7.6.10 **R** A firm may calculate a derived position for its net position in an option or a warrant, if the relevant options or warrants are identical or may be treated as identical under ■ BIPRU 7.6.11R or ■ BIPRU 7.6.12R.

7.6.11 **R** A firm may treat options or warrants as identical if they have the same strike price, maturity (except for an interest rate cap or floor - see ■ BIPRU 7.6.12R) and underlying.

7.6.12 **R** A firm may treat as identical a purchased interest rate cap (or floor) and a written interest rate cap (or floor) only if they mature within 30 days of each other and all other terms are identical (a cap may not be netted against a floor).

Derived positions

7.6.13 **R** Table: Derived positions

This table belongs to ■ BIPRU 7.6.9R

Underlying	Option (or warrant)	Derived position
Equity	Option (warrant) on a single equity or option on a future/forward on a single equity	A notional position in the actual equity underlying the contract valued at the current market price of the equity.
	Option (warrant) on a basket of equities or option on a future/forward on a basket of equities	A notional position in the actual equities underlying the contract valued at the current market price of the equities.
	Option (warrant) on an equity index or option on a future/forward on an equity index	A notional position in the index underlying the contract valued at the current market price of the index.
Interest rate	Option on an interest rate or an interest rate future/FRA	A zero coupon zero-specific-risk security in the currency concerned with a maturity equal to the sum of the time to expiry of the contract and the length of the period on which the settlement amount of the contract is calculated valued at the notional amount of the contract.

Underlying	Option (or warrant)	Derived <i>position</i>
Debt securities	<i>Option on an interest rate swap</i>	A zero coupon <i>zero-specific-risk security</i> in the currency concerned with a maturity equal to the length of the <i>swap</i> valued at the notional principal amount.
	Interest rate cap or floor	A zero coupon <i>zero-specific-risk security</i> in the currency concerned with a maturity equal to the remaining period of the cap or floor valued at the notional amount of the contract.
	<i>Option (warrant) on a debt security or option on a future/forward on a debt security</i>	The underlying debt security with a maturity equal to the time to expiry of the <i>option</i> valued as the nominal amount underlying the contract at the current market price of the debt security.
	<i>Option (warrant) on a basket of debt securities or option on a future/forward on a basket of debt securities</i>	A notional <i>position</i> in the actual debt securities underlying the contract valued at the current market price of the debt securities.
Commodity	<i>Option (warrant) on an index of debt securities or option on a future/forward on an index of debt securities</i>	A notional <i>position</i> in the index underlying the contract valued at the current market price of the index.
	<i>Option on a commodity or option on a future/forward on a commodity</i>	An amount equal to the tonnage, barrels or kilos underlying the <i>option</i> with (in the case of a <i>future/forward on a commodity</i>) a maturity equal to the expiry date of the <i>forward</i> or <i>Futures</i> contract underlying the <i>option</i> . In the case of an <i>option on a commodity</i> the maturity of the <i>position</i> falls into Band 1 in the table in BIPRU 7.4.28R (Table: Maturity bands for the maturity ladder approach).
	<i>Option on a commodity swap</i>	An amount equal to the tonnage, barrels or kilos underlying the <i>option</i> with a maturity equal to the length of the <i>swap</i> valued at the

Underlying	Option (or warrant)	Derived <i>position</i>
<i>CIU</i> (These provisions about <i>CIUs</i> are subject to BIPRU 7.6.35R)	<i>Option (warrant) on a single CIU or option on a future/forward on a single CIU</i>	notional principal amount. A notional <i>position</i> in the actual <i>CIU</i> underlying the contract valued at the current market price of the <i>CIU</i> .
Gold	<i>Option (warrant) on a basket of CIUs or option on a future/forward on a basket of CIUs</i> <i>Option on gold or option on a future/forward on gold</i>	A notional <i>position</i> in the actual <i>CIUs</i> underlying the contract valued at the current market price of the <i>CIUs</i> . An amount equal to the troy ounces underlying the <i>option</i> with (in the case of a <i>future/forward</i> on gold) a maturity equal to the expiry date of the <i>forward</i> or <i>futures</i> contract underlying the <i>option</i> .
Currency	Currency <i>option</i>	The amount of the underlying currency that the <i>firm</i> will receive if the <i>option</i> is exercised converted at the spot rate into the currency that the <i>firm</i> will sell if the <i>option</i> is exercised.

Combinations of options which can be treated as one option

7.6.14

R

A *firm* may treat (for the purpose of calculating an *option PRR* under ■ BIPRU 7.6) an *option* strategy listed in the table in ■ BIPRU 7.6.15R as the single *position* in a notional *option* specified against that strategy in the table in ■ BIPRU 7.6.15R, if:

- (1) each element of the strategy is transacted with the same *counterparty*;
- (2) the strategy is documented as a single structure;
- (3) the underlying for each part of the composite *position* (including any actual holding of the underlying) is the same under the *PRR identical product netting rules*;
- (4) the netting achieved does not result overall in a greater degree of netting in the calculation of the *market risk capital requirement* than would be permitted under the other *standard market risk PRR rules*;
- (5) each *option* in the structure has the same maturity and underlying;
and

- (6) the constituent parts of the structure form an indivisible single contract, so that neither party can unwind or default on one part of the structure without doing so for the contract as a whole;

except that (1) and (6) only apply to the extent possible with respect to any part of the composite *position* held by the *firm* that consists of an actual holding of the underlying.

7.6.15 **R** Table: Option strategies

This table belongs to ■ BIPRU 7.6.14R

Option strategy (and an example)	Notional option (and rule it must be treated under)
Bull Spread (e.g. buy 100 call and sell 101 call)	One purchased <i>option</i> (treat under BIPRU 7.6.20R)
Bear Spread (e.g. sell 100 put and buy 101 put)	One written <i>option</i> (treat under BIPRU 7.6.21R)
Synthetic Long Call (e.g. long underlying and buy 100 put)	One purchased <i>option</i> (treat under BIPRU 7.6.20R or BIPRU 7.6.24R)
Synthetic Short Call (e.g. short underlying and sell 100 put)	One written <i>option</i> (treat under BIPRU 7.6.21R or BIPRU 7.6.24R)
Synthetic Long Put (e.g. short underlying and buy 100 call)	One purchased <i>option</i> (treat under BIPRU 7.6.20R or BIPRU 7.6.24R)
Synthetic Short Put (e.g. buy underlying and sell 100 call)	One written <i>option</i> (treat under BIPRU 7.6.21R or BIPRU 7.6.24R)
Long Straddle (e.g. buy 100 call and buy 100 put)	One purchased <i>option</i> (treat under BIPRU 7.6.20R)
Short Straddle (e.g. sell 100 call and sell 100 put)	One written <i>option</i> (treat under BIPRU 7.6.21R but with no reduction for the amount the <i>option</i> is <i>out of the money</i>)
Long Strangle (e.g. buy 101 call and buy 99 put)	One purchased <i>option</i> (treat under BIPRU 7.6.20R)
Short Strangle (e.g. sell 99 call and sell 101 put)	One written <i>option</i> (treat under BIPRU 7.6.21R but with no reduction for the amount the <i>option</i> is <i>out of the money</i>)
Long Butterfly (e.g. buy one 100 call, sell two 101 calls, and buy one 102 call)	One purchased <i>option</i> (treat under BIPRU 7.6.20R)
Short Butterfly (e.g. sell one 100 put, buy two 101 puts, and sell one 102 put)	One written <i>option</i> (treat under BIPRU 7.6.21R but with no reduction for the amount the <i>option</i> is <i>out of the money</i>)

The option PRR for an individual positions

7.6.16 **R** A firm must calculate the *option PRR* for each individual derived *option position* using the method specified in the table in **■ BIPRU 7.6.18R**, or, if more than one method is permitted, using one of those methods.

7.6.17 **R** A firm must convert its *positions* into its *base currency* in accordance with the procedures that apply for whichever of the other *PRR charges* is appropriate (see **■ BIPRU 7.2.1R(3)**, **■ BIPRU 7.3.1R(2)**, **■ BIPRU 7.4.1R(3)**, **■ BIPRU 7.5.19R(2)**, **■ BIPRU 7.5.20R(3)** and **■ BIPRU 7.7.1R(3)**).

7.6.18 **R** Table: Option PRR: methods for different types of option
This table belongs to **■ BIPRU 7.6.16R**

Option	Description	Method
American option	An option that may be exercised at any time over an extended period up to its expiry date.	Option standard method or option hedging method if appropriate
European option	An option that can only be exercised at expiry.	
Bermudan option	A cross between an American option and European option. The Bermudan option can only be exercised at specific dates during its life.	
Asian option	The buyer has the right to exercise at the average rate or price of the underlying over the period (or part of the period) of the option. One variant is where the payout is based on the average of the underlying against a fixed strike price; another variant is where the payout gives at expiry the price of the underlying against the average price over the option period.	Option standard method or option hedging method if appropriate
Barrier option	An option which is either cancelled or activated if the price of the underlying reaches a pre-set level regardless of the price at which the underlying may be trading at the expiry of the option. The knock-out type is cancelled if the underlying price or rate trades through the	

Option	Description	Method
Corridor option	trigger; while the knock-in becomes activated if the price moves through the trigger. Provides the holder with a pay-out for each day that the underlying stays within a defined range chosen by the investor.	
Ladder option	Provides the holder with guaranteed pay-outs if the underlying trades through a pre-agreed price(s) or rate(s) at a certain point(s) in time, regardless of future performance.	
Lock-in option	An option where the pay-out to the holder is locked in at the maximum (or minimum) value of the underlying that occurred during the life of the option.	
Look-back option	A European style option where the strike price is fixed in retrospect, that is at the most favourable price (i.e. the lowest (highest) price of the underlying in the case of a call (put)) during the life of the option.	
Forward starting option	An option that starts at a future date.	
Compound option	An option where the underlying is itself an option (i.e. an option on an option).	Option standard method or option hedging method if appropriate
Interest rate cap	An interest rate option or series of options under which a counterparty contracts to pay any interest costs arising as a result of an increase in rates above an agreed rate: the effect being to provide protection to the holder against a rise above that agreed interest rate.	Option standard method, but no reduction for the amount the option is out of the money is permitted
Interest rate floor	An interest rate option or series of options under which a counter-	

Option	Description	Method
Performance option	<p>party contracts to pay any lost income arising as a result of a fall in rates below an agreed rate: the effect being to provide protection to the holder against a fall below that agreed interest rate.</p> <p>An <i>option</i> based on a reference basket comprising any number of assets, where the payout to the holder could be one of the following: the maximum of the worst performing asset, or 0; the maximum of the best performing asset, or 0; the maximum of the spreads between several pairs of the assets, or 0.</p>	<p><i>Option standard method</i> or <i>option hedging method</i> - using the highest <i>position risk adjustment</i> of the individual assets in the basket</p>
Quanto	<p>Quanto stands for "Quantity Adjusted <i>Option</i>". A quanto is an instrument where two currencies are involved. The payoff is dependent on a variable that is measured in one of the currencies and the payoff is made in the other currency.</p>	<p>Subject to BIPRU 7.6.31R, the <i>option standard method</i></p>
Cliquet option	<p>A cliquet <i>option</i> consists of a series of forward starting <i>options</i> where the strike price for the next exercise date is set equal to a positive constant times the underlying price as of the previous exercise date. It initially acts like a vanilla <i>option</i> with a fixed price but as time moves on, the strike is reset and the intrinsic value automatically locked in at pre-set dates. If the underlying price is below the previous level at the reset date no intrinsic value is locked in but the strike price will be reset to the current price attained by the underlying. If the underlying</p>	<p><i>Option standard method</i> for a purchased cliquet, or the method specified in BIPRU 7.6.30R for a written cliquet</p>

Option	Description	Method
Digital option	price exceeds the current level at the next reset the intrinsic value will again be locked in. A type of <i>option</i> where the pay-out to the holder is fixed. The most common types are all-or-nothing and one-touch <i>options</i> . All-or-nothing will pay out the fixed amount if the underlying is above (call) or below (put) a set value at expiry. The one-touch will pay the fixed amount if the underlying reaches a fixed point any time before expiry.	The method specified in BIPRU 7.6.29 R
Any other option or warrant		The method specified for the type of instrument whose description it most closely resembles.

- 7.6.19 **G**
- (1) The *option standard method* is described in ■ BIPRU 7.6.20R - ■ BIPRU 7.6.22R.
 - (2) The *option hedging method* is described in ■ BIPRU 7.6.23G - ■ BIPRU 7.6.28R.

The standard method: Purchased options and warrants

- 7.6.20 **R**
- Under the *option standard method*, the PRR for a purchased *option* or *warrant* is the lesser of:
- (1) the market value of the derived *position* (see ■ BIPRU 7.6.9R) multiplied by the *appropriate position risk adjustment* (see ■ BIPRU 7.6.8R); and
 - (2) the market value of the *option* or *warrant*.

The standard method: Written options and warrants

- 7.6.21 **R**
- Under the *option standard method*, the PRR for a written *option* or *warrant* is the market value of the derived *position* (see ■ BIPRU 7.6.9R) multiplied by the *appropriate position risk adjustment* (see ■ BIPRU 7.6.8R). This result may be reduced by the amount the *option* or *warrant* is *out of the money* (subject to a maximum reduction to zero).

The standard method: Underwriting or sub-underwriting an issue of warrants

- 7.6.22 **R** Under the *option standard method*, the *PRR* for underwriting or sub-underwriting an issue of warrants is the *net underwriting position* (or *reduced net underwriting position*) multiplied by the current market price of the underlying *securities* multiplied by the *appropriate position risk adjustment*, but the result can be limited to the value of the *net underwriting position* (or *reduced net underwriting position*) calculated using the issue price of the *warrant*.

The hedging method

- 7.6.23 **G** The *option hedging method* involves the *option PRR* being calculated on a combination of the *option* and its hedge.

- 7.6.24 **R** Under the *option hedging method* a *firm* must calculate the *option PRR* for individual *positions* as follows:

- (1) for an *option* or *warrant* on an *equity*, basket of *equities* or *equity index* and its *equity* hedge(s), the *firm* must, to the extent specified or permitted in the table in ■ BIPRU 7.6.26R, use the calculation in the table in ■ BIPRU 7.6.27R;
- (2) for an *option* or *warrant* on a *debt security*, basket of *debt securities* or *debt security index* and its *debt security* hedge(s), the *firm* must, to the extent specified or permitted in the table in ■ BIPRU 7.6.26R, use the calculation in the table in ■ BIPRU 7.6.27R;
- (3) for an *option* on gold and its gold hedge, the *firm* must, to the extent specified or permitted in the table in ■ BIPRU 7.6.26R, use the calculation in the table in ■ BIPRU 7.6.27R; and
- (4) for an *option* on a *currency* and its *currency* hedge, the *firm* must, to the extent specified or permitted in the table in ■ BIPRU 7.6.26R, use the calculation in the table in ■ BIPRU 7.6.28R.

- 7.6.25 **R**
- (1) A *firm* may not use the *option hedging method* for:
 - (a) an *interest rate option* and its hedge; or
 - (b) a *commodity option* and its hedge; or
 - (c) a *CIU option* and its hedge.
 - (2) A *firm* may only use the *option hedging method* if the item underlying the *option* or *warrant* is the same as the hedge of the *option* or *warrant* under the *PRR identical product netting rules*.

- 7.6.26 **R** Table: Appropriate treatment for equities, debt securities or currencies hedging options

This table belongs to ■ BIPRU 7.6.24R

Hedge	PRR calculation for the hedge	Limits (if hedging method is used)	Naked position
An equity (hedging an option or warrant)	The equity must be treated in either BIPRU 7.3 (equity PRR) or the option hedging method (see the table in BIPRU 7.6.27R)	The option hedging method must only be used up to the amount of the hedge that matches the notional amount underlying the option or warrant	To the extent that the amount of the hedge (or option or warrant) exceeds the notional amount underlying the option or warrant (or hedge), a firm must apply an equity PRR, interest rate PRR or foreign currency PRR (or the option standard method)
A debt security (hedging an option or warrant)	The debt security must be treated in BIPRU 7.2 (interest rate PRR) or the option hedging method (see the table in BIPRU 7.6.27R)	As for the first row	As for the first row
Gold (hedging a gold option)	The gold must be treated in either BIPRU 7.5 (Foreign currency PRR) or the option hedging method (see the table in BIPRU 7.6.27R)	As for the first row	As for the first row
A currency or currencies (hedging a currency option)	The currency must be treated in either BIPRU 7.5 (Foreign currency PRR) or the option hedging method (see the table in BIPRU 7.6.28R)	As for the first row	As for the first row

7.6.27 **R** Table: The hedging method of calculating the PRR (equities, debt securities and gold)

This table belongs to ■ BIPRU 7.6.24R(1) - ■ (3)

		PRR		
	Option or warrant position	In the money by more than the position risk adjustment	In the money by less than the position risk adjustment	Out of the money or at the money
Long in security or gold	Long put	Zero	Wp	X
	Short call	Y	Y	Z

		PRR		
Short in security or gold	Long call	Zero	Wc	X
	Short put	Y	Y	Z
Where:				
Wp means	$\{(position\ risk\ adjustment - 100\%) \times \text{The underlying position valued at strike price}\}$		+	The market value of the underlying position
Wc means	$\{(100\% + position\ risk\ adjustment) \times \text{The underlying position valued at strike price}\}$		-	The market value of the underlying position
X means	The market value of the underlying position multiplied by the appropriate position risk adjustment			
Y means	The market value of the underlying position multiplied by the appropriate position risk adjustment. This result may be reduced by the market value of the option or warrant, subject to a maximum reduction to zero.			
Z means	The option hedging method is not permitted; the option standard method must be used.			

7.6.28 **R** Table: The hedging method of calculating the PRR (currencies)

This table belongs to ■ BIPRU 7.6.24R(4)

Option position	PRR		
	In the money by more than 8%	In the money by less than 8%	Out of the money or at the money
Long calls & long puts	Zero	W _L	X
Short calls & short puts	Zero	Y	X
Where:			
W _L means	(1.08% x U)	-	The market value of the underlying position
U means	The amount of the underlying currency that the firm will receive if the option is exercised, converted at the strike price into the currency that the firm will sell if the option is exercised		
X means	The market value of the underlying position multiplied by 8%.		
Y means	The market value of the underlying position multiplied by 8%. This result may be reduced by the market value of the option, subject to a maximum reduction to zero.		

Specific methods and treatments: Digital options

7.6.29 **R** The option PRR for a digital option is the maximum loss of the option.

Specific methods and treatments: Written cliquet options

7.6.30 **R** The *option PRR* for a written cliquet *option* is the market value of the derived *position* (see **■ BIPRU 7.6.9R**) multiplied by the *appropriate position risk adjustment* (see **■ BIPRU 7.6.8R**) multiplied by F+1 (see the following provisions of this paragraph). This result may be reduced by the amount the *option* is *out of the money* (subject to a maximum reduction to zero). The *option PRR* for a written cliquet *option* is therefore defined by the following formula:

$$[\textit{position risk adjustment} * \textit{underlying} * (F + 1)] - \textit{OTM}$$

where:

$$(1) \quad F = \min \left[FR, \max \left(\frac{FR}{2}, Y \right) \right]$$

(2) FR= Number of forward re-sets

(3) Y= Years to maturity

(4) OTM= the amount by which the *option* is *out of the money*

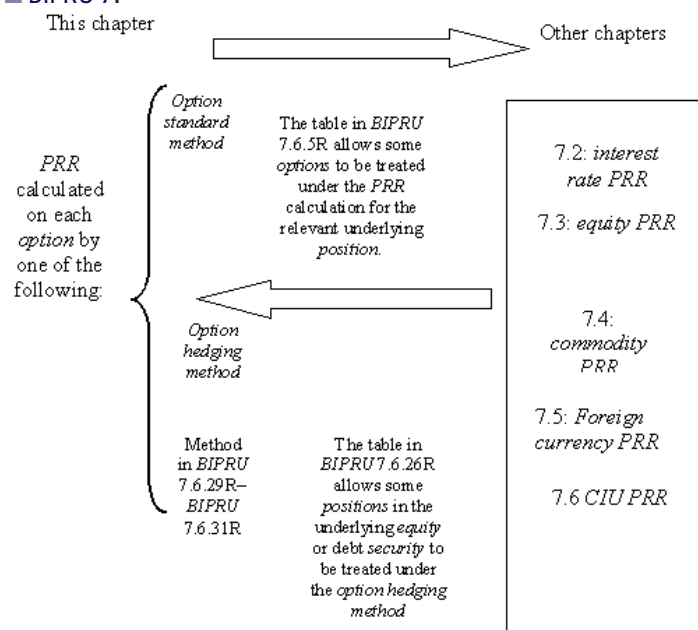
Specific methods and treatments: Quantos

7.6.31 **R** If the pay-out to the holder of a quanto *option* is fixed at the inception of the transaction a *firm* must add 8% to the *position risk adjustment* when applying the *option standard method*.

Interaction with other chapters

7.6.32 **G** The application of an *option PRR* to a *position* does not prevent any of the other *PRR charges* from applying if they would otherwise do so. In particular if a *firm* applies an *option PRR* to an *equity derivative* an *interest rate PRR* will also generally apply.

7.6.33 **G** The following diagram illustrates the relationship between **■ BIPRU 7.6** and the rest of **■ BIPRU 7**.



Options on a commodity

- 7.6.34 **R** ■ BIPRU 7.4.38R to ■ BIPRU 7.4.41R (Liquidity and other risks) apply to *commodity options* treated under ■ BIPRU 7.6 as well as to those treated under ■ BIPRU 7.4 (Commodity PRR).

Options on a CIU

- 7.6.35 **R** For the purpose of identifying the appropriate treatment for the purpose of ■ BIPRU 7.6.5R, the underlying *position* for the purpose of ■ BIPRU 7.6.8R and the derived *position* under ■ BIPRU 7.6.13R a *firm* may choose between treating an *option* on a *CIU* as being:

- (1) a *position* in the *CIU* itself; or
- (2) (if the conditions in ■ BIPRU 7.7 (Position risk requirements for collective investment undertakings) for the use of the method in question are satisfied) *positions* in the underlying investments or assumed *positions* arising through the use of the *standard CIU look through method* or the *modified CIU look through method*.

- 7.6.36 **G**
- (1) This paragraph gives an example of how the *appropriate position risk adjustment* should be calculated for the purpose of deciding whether or not an *option* on a *CIU* is sufficiently *in the money* for the *firm* to have a choice whether or not to apply an *option PRR*. This example assumes that there is no leveraging (see ■ BIPRU 7.7.11R (CIU modified look through method)).
 - (2) Say that the *CIU* contains underlying *equity position* and the *firm* is using one of the *CIU look through methods*. The *appropriate position risk adjustment* for some is 8% and for the others is 12%. The *firm* should identify the highest *appropriate position risk adjustment* for the underlyings. In this case it is 12%. Therefore in this case the

option would need to be *in the money* by more than 12% in order for the *firm* to have a choice between applying the *option PRR* or one of the other *PRR charges*.

- (3) However if the *firm* is not using one of the *CIU look through methods* the *option* would need to be *in the money* by more than 32% in order for the *firm* to have a choice between applying the *option PRR* or the *CIU PRR*.

7.6.37

G

- BIPRU 7.6.10R - ■ BIPRU 7.6.12R are subject to ■ BIPRU 7.7.3R (netting).
- BIPRU 7.7.4R (use of third party) applies for the purpose of ■ BIPRU 7.6.

7.7 Position risk requirements for collective investment undertakings

Collective investment undertaking PRR calculation

- 7.7.1** **R** A *firm* must calculate its *CIU PRR* by:
- (1) identifying which *CIU positions* must be included within the scope of the *PRR* calculation (see ■ BIPRU 7.7.2R);
 - (2) identifying which *CIU positions* are to be subject to the *CIU PRR* and which *positions* are to be subject to one of the other *PRR charges*;
 - (3) converting on a daily basis net *positions* into the *firm's base currency* at the prevailing spot exchange rate before their aggregation;
 - (4) calculating an individual *PRR* for each *position* in a *CIU* (see ■ BIPRU 7.7.5R);
 - (5) summing the resulting individual *PRRs*.

Scope of the PRR calculation for collective investment undertakings

- 7.7.2** **R**
- (1) A *firm's PRR* calculation must include all *trading book positions* in *CIUs*.
 - (2) A *firm's CIU PRR* calculation must include all *trading book positions* in *CIUs* unless they are treated under one of the *CIU look through methods* and included in the *PRR* calculations for the relevant underlying investments or subject to an *option PRR*.
 - (3) A *firm's PRR* calculation for *CIUs* must include notional *positions* arising from *trading book positions* in *options* or *warrants* on *collective investment undertakings*.

General rules

- 7.7.3** **R** Unless noted otherwise, no netting is permitted between the underlying investments of a *CIU* and other *positions* held by a *firm* for the purposes of calculating the *PRR charge* for a *position* in a *CIU*.
- 7.7.4** **R** A *firm* may rely on a third party to calculate and report *PRR* capital requirements for *position risk* (*general market risk* and *specific risk*) for *positions* in *CIUs* falling within ■ BIPRU 7.7.9R and ■ BIPRU 7.7.11R, in

accordance with the methods set out in ■ BIPRU 7.7, provided that the correctness of the calculation and the report is adequately ensured.

Calculation of the collective investment undertaking PRR

- 7.7.5** **R** Without prejudice to other provisions in ■ BIPRU 7.7, a *position* in a *CIU* is subject to a *collective investment undertaking PRR* (general market risk and specific risk) of 32%. Without prejudice to provisions in ■ BIPRU 7.5.18R (Foreign currency PRR for *CIUs*) or, if the *firm* has a *VaR model permission*, ■ BIPRU 7.10.44R (Commodity risks and *VaR models*) taken together with ■ BIPRU 7.5.18R, where the modified gold treatment set out in those *rules* is used, a *position* in a *CIU* is subject to a *securities PRR* requirement for position risk (general market risk and specific risk) and a foreign currency PRR of no more than 40%.

Look through methods: General criteria

- 7.7.6** **R** A *firm* may determine the *securities PRR* requirement for *positions* in *CIUs* which meet the criteria set out in ■ BIPRU 7.7.7R, by one of the following methods:

- (1) the *standard CIU look through method* (■ BIPRU 7.7.4R and ■ BIPRU 7.7.7R - ■ BIPRU 7.7.10R); or
- (2) the *modified CIU look through method* (■ BIPRU 7.7.4R, ■ BIPRU 7.7.7R - ■ BIPRU 7.7.8R and ■ BIPRU 7.7.11R - ■ BIPRU 7.7.12R).

- 7.7.7** **R** The general eligibility criteria for using the methods in ■ BIPRU 7.7.4R and ■ BIPRU 7.7.9R - ■ BIPRU 7.7.11R, for *CIUs* issued by *companies* supervised or incorporated within the *UK* are that:

- (1) the *CIU's* prospectus or equivalent document must include:
 - (a) the categories of assets the *CIU* is authorised to invest in;
 - (b) if investment limits apply, the relative limits and the methodologies to calculate them;
 - (c) if leverage is allowed, the maximum level of leverage; and
 - (d) if investment in OTC financial derivatives or repo-style transactions are allowed, a policy to limit counterparty risk arising from these transactions;
- (2) the business of the *CIU* must be reported in half-yearly and annual reports to enable an assessment to be made of the assets and liabilities, income and operations over the reporting period;
- (3) the units/shares of the *CIU* are redeemable in cash, out of the *undertaking's* assets, on a daily basis at the request of the Unitholder;
- (4) investments in the *CIU* must be segregated from the assets of the *CIU* manager; and
- (5) there must be adequate risk assessment, by the investing *firm*, of the *CIU*.

- 7.7.8 **R** Third country *CIUs* are eligible if the requirements in ■ BIPRU 7.7.7R (1) - ■ BIPRU 7.7.7R (5) are met.

Standard CIU look through method: General

- 7.7.9 **R**
- (1) Where a *firm* is aware of the underlying investments of the *CIU* on a daily basis the *firm* may look through to those underlying investments in order to calculate the *securities PRR* for *position risk* (*general market risk* and *specific risk*) for those *positions* in accordance with the methods set out in the *securities PRR* requirements or, if the *firm* has a *VaR model permission*, in accordance with the methods set out in ■ BIPRU 7.10 (Use of a Value at Risk Model).
 - (2) Under this approach, *positions* in *CIUs* must be treated as *positions* in the underlying investments of the *CIU*. Netting is permitted between *positions* in the underlying investments of the *CIU* and other *positions* held by the *firm*, as long as the *firm* holds a sufficient quantity of units to allow for redemption/creation in exchange for the underlying investments.

Standard CIU look through method: Index or basket funds

- 7.7.10 **R**
- (1) A *firm* may calculate the *securities PRR* for *position risk* (*general market risk* and *specific risk*) for *positions* in *CIUs* in accordance with the methods set out in the *securities PRR* requirements or, if the *firm* has a *VaR model permission*, in accordance with the methods set out in ■ BIPRU 7.10 (Use of a Value at Risk Model), to assumed *positions* representing those necessary to replicate the composition and performance of the externally generated index or fixed basket of *equities* or *debt securities* referred to in (a), subject to the following conditions:
 - (a) the purpose of the *CIU's* mandate is to replicate the composition and performance of an externally generated index or fixed basket of *equities* or *debt securities*; and
 - (b) a minimum correlation of 0.9 between daily price movements of the *CIU* and the index or basket of *equities* or *debt securities* it tracks can be clearly established over a minimum period of six months.
 - (2) Correlation as referred to in (1)(b) means the correlation coefficient between daily returns on the *CIU* and the index or basket of *equities* or *debt securities* it tracks.

CIU modified look through method

- 7.7.11 **R**
- Where a *firm* is not aware of the underlying investments of the *CIU* on a daily basis, the *firm* may calculate the *securities PRR* for *position risk* (*general market risk* and *specific risk*) in accordance with the methods set out in the *securities PRR* requirements, subject to the following conditions:
- (1) it must be assumed that the *CIU* first invests to the maximum extent allowed under its mandate in the asset classes attracting the highest *securities PRR* for *position risk* (*general market risk* and *specific risk*), and then continues making investments in descending order until the maximum total investment limit is reached;

- (2) the *firm* must take account of the maximum indirect exposure that it could achieve by taking leveraged *positions* through the *CIU* when calculating its *securities PRR* for *position* risk, by proportionally increasing the *position* in the *CIU* up to the maximum exposure to the underlying investment items resulting from the investment mandate; and
- (3) should the *securities PRR* for *position* risk (*general market risk* and *specific risk*) under this approach exceed that set out in ■ BIPRU 7.7.5R, the *PRR charge* must be capped at that level.

7.7.12 **R** For the purpose of ■ BIPRU 7.7.11R (1) the *position* in the *CIU* must be treated as a direct holding in the assumed *position*.

CAD 1 models and VaR models

7.7.13 **G** Where ■ BIPRU 7.7 permits a *firm* to calculate the *PRR charge* for a *position* in a *CIU* using the *rules* in ■ BIPRU 7 relating to the underlying investment, a *firm* that has:

- (1) a *CAD 1 model waiver* that covers *positions* in *CIUs* may use the *rules* as modified by that *waiver*; and
- (2) a *VaR model permission* that covers *positions* in *CIUs* may use its *VaR model*.

Options on a CIU

7.7.14 **G** An *option* on a *CIU* should be treated in accordance with ■ BIPRU 7.6.35R to ■ BIPRU 7.6.37G (Options on a *CIU*).

7.8 Securities underwriting

General rules

- 7.8.1** **G** ■ BIPRU 7.8 sets out the method for calculating a *net underwriting position* or *reduced net underwriting position*, which is then included in the *PRR* calculation in other parts of ■ BIPRU 7. It also deals with concentration risk. ■ BIPRU 7.8 only relates to new *securities*, which is defined in ■ BIPRU 7.8.12R.
- 7.8.2** **R** A firm which *underwrites* or *sub-underwrites* an issue of *securities* must, for the purposes of calculating its market risk capital component:
- (1) identify commitments to *underwrite* or *sub-underwrite* which give rise to an *underwriting position* (see ■ BIPRU 7.8.8R);
 - (2) identify the time of *initial commitment* (see ■ BIPRU 7.8.13R); and
 - (3) calculate the *net underwriting position* (set out in ■ BIPRU 7.8.17R), *reduced net underwriting position* or the *net underwriting exposure*.
- 7.8.3** **R** A firm must include the *net underwriting position* or *reduced net underwriting position* in whichever one or more of the following is or are relevant:
- (1) ■ BIPRU 7.2.3R (1) where *debt securities* are being underwritten;
 - (2) ■ BIPRU 7.3.2R (1) where *equities* are being underwritten;
 - (3) ■ BIPRU 7.6.22R where *warrants* are being underwritten; and
 - (4) ■ BIPRU 7.5.3R where the *equities*, *debt securities* or *warrants* being underwritten are denominated in a *foreign currency*.
- 7.8.4** **R** A firm must comply with ■ BIPRU 7.8.3R from *initial commitment* (as determined under ■ BIPRU 7.8.8R) until the end of the fifth *business day* after *working day 0* (as determined under ■ BIPRU 7.8.23R).
- 7.8.5** **G** *Sub-underwriting* is a commitment given by one *firm* to someone other than the issuer or seller of the *securities* to *sub-underwrite* all or part of an issue of *securities*.

7.8.6 **G** The *net underwriting position* calculated in ■ BIPRU 7.8.17R will also be used in calculating the *net underwriting exposure* under ■ BIPRU 7.8.34R.

7.8.7 **G** The *net underwriting position* or *reduced net underwriting position* arising from *underwriting* or *sub-underwriting* a rights or *warrants* issue should be calculated using the current market price of the underlying *security* for the purposes of the *equity PRR* or *option PRR*. However, the *PRR* will be limited to the value of the *net underwriting position* calculated using the initial issue price of the rights or *warrants*. Where there is no market price because the rights or *warrants* are in relation to a new class of *securities* and the initial price has not been set the *net underwriting position* or *reduced net underwriting* is the amount of the commitment.

Commitment to underwriting securities

7.8.8 **R**

- (1) For the purpose of ■ BIPRU 7.8.2R (1), a *firm* has a commitment to *underwrite* or *sub-underwrite* an issue of *securities* where:
 - (a) it gives a commitment to an issuer of *securities* to *underwrite* an issue of *securities*; or
 - (b) (where ■ BIPRU 7.8.12R (2) applies) it gives a commitment to a seller of *securities* to *underwrite* a sale of those *securities*;
 - (c) it gives a commitment to a *person*, other than the issuer of *securities* or, if ■ BIPRU 7.8.12R (2) applies, the seller of the *securities*, to *sub-underwrite* an issue of *securities*; or
 - (d) it is a member of a syndicate or group that gives a commitment of the type described in (1)(a)-(c).
- (2) Unless a *rule* deals with them separately or the context otherwise requires, a provision of ■ BIPRU 7.8 that deals with *underwriting* also applies to *sub-underwriting*.

Exclusions from BIPRU 7.8

7.8.9 **G**

- (1) Block trades, including bought deals, and private placements are not within the scope of ■ BIPRU 7.8 because they involve an outright purchase by the *firm* of the relevant *securities*.
- (2) For the purpose of ■ BIPRU 7.8 *securities* include debt and *equity* instruments and *convertibles* but excludes loans.

Grey market transactions

7.8.10 **R**

- (1) A *firm* that buys and sells *securities* before issue is dealing in the grey market for the purposes of ■ BIPRU 7.8.
- (2) ■ BIPRU 7.8 does not apply to a *firm* with respect to its dealings in the grey market unless the *firm*:
 - (a) has an *underwriting* commitment to the issuer in respect of those *securities*; or
 - (b) has a *sub-underwriting* commitment in respect of those *securities* and is using the grey market solely for the purpose of reducing that *sub-underwriting* commitment.

(3) ■ BIPRU 7.8 does not apply to a *firm* with respect to its dealings in the grey market if the transaction is undertaken by the proprietary trading part of the *firm* or is undertaken for proprietary trading purposes.

(4) ■ BIPRU 7.8 does not apply to a *firm* with respect to its dealings in the grey market except as described in ■ BIPRU 7.8.17R.

7.8.11

G

In ■ BIPRU 7.8 the grey market is the market in which dealers "buy" and "sell" *securities* ahead of issue. In reality the dealers are buying and selling promises to deliver the *securities* when issued.

New securities

7.8.12

R

For the purposes of ■ BIPRU 7.8, a *firm* must treat *securities* as being new for the purposes of the definition of *underwriting* if they are:

- (1) *securities* that, prior to the allotment following the *underwriting*, were not in issue; or
- (2) *securities* that do not fall within (1) but that have not previously been offered for sale or subscription to the public and have not been admitted to trading on a market operated by a *recognised investment exchange* or an *overseas investment exchange*.

Time of initial commitment

7.8.13

R

Subject to ■ BIPRU 7.8.14R, the time of *initial commitment* is the earlier of:

- (1) (in the case of *underwriting*) the time the *firm* agrees with the issuer of *securities* to *underwrite* those *securities*; or
- (2) (in the case of *underwriting* falling under ■ BIPRU 7.8.12R (2)) the time the *firm* agrees with the seller of *securities* to *underwrite* those *securities*; or
- (3) (in the case of *sub-underwriting*) the time the *firm* agrees with the *person* referred to ■ BIPRU 7.8.8R (1)(c) to *sub-underwrite* those *securities*; or
- (4) (in the case of ■ BIPRU 7.8.8R (1)(d)) the time the group or syndicate in question (or a member of that group or syndicate on behalf of the others) agrees with the issuer or other *person* to whom the commitment is given as referred to in ■ BIPRU 7.8.8R (1)(d) to *underwrite* or *sub-underwrite* the *securities* in question; or
- (5) (if the *firm* at that time has a commitment, whether legally or binding or not) the time the price and allocation of the issue or offer are set.

7.8.14

R

If a *firm* has an irrevocable and unfettered right to withdraw from an *underwriting* commitment, exercisable within a certain period, the commitment commences (and thus the time of *initial commitment* occurs) when that right expires.

7.8.15 **G** Subject to the existence of a right described in ■ BIPRU 7.8.14R an *underwriting* commitment commences even if it is subject to formal, legal or other conditions that would normally be expected to be satisfied.

7.8.16 **G** A force majeure or material adverse change clause would not be a right of the sort referred to in ■ BIPRU 7.8.14R.

Calculating the net underwriting position

7.8.17 **R** A firm must calculate a *net underwriting position* by adjusting the gross amount it has committed to *underwrite* for:

- (1) any sales or sub-*underwriting* commitments received that have been confirmed in writing at the time of *initial commitment* (but excluding any sales in the grey market as defined in ■ BIPRU 7.8.10R (1));
- (2) any *underwriting* or sub-*underwriting* commitments obtained from others since the time of *initial commitment*;
- (3) any purchases or sales of the *securities* since the time of *initial commitment* (other than purchases or sales in the grey market as defined in ■ BIPRU 7.8.10R (1));
- (4) (in the case of sales in the grey market as defined in ■ BIPRU 7.8.10R (1)) any sales of the *securities* as at the time of *initial commitment* or since the time of *initial commitment* subject, in both cases, to the following conditions:
 - (a) any sales of the *securities* as at the time of *initial commitment* must be confirmed in writing at the time of *initial commitment*; and
 - (b) sales must be net of any purchases in the grey market as defined in ■ BIPRU 7.8.10R (1); and
- (5) any allocation of *securities* granted or received, arising from the commitment to *underwrite* the *securities*, since the time of *initial commitment*.

7.8.18 **R** If the allocation of *securities* has not been fixed a firm must calculate the gross amount of its commitment, for the purposes of ■ BIPRU 7.8.17R, by reference to the maximum amount it has committed to *underwrite* until the time the allocation is set.

7.8.19 **R** An *underwriting* commitment may only be reduced under ■ BIPRU 7.8.17R on the basis of a formal agreement.

7.8.20 **G** Allocations may arise, after date of *initial commitment*, from the agreement to *underwrite*. For example obligations or rights may be allocated to or from the issuer, the *underwriting* group or syndicate.

Over-allotment options

- 7.8.21 **R** (1) This *rule* deals with the treatment of short *positions* that arise when a *firm* commits to distribute *securities* that it is *underwriting* in an amount that exceeds the allocation to the *firm* made by the issuer of the *securities* being *underwritten*.
- (2) When calculating its *net underwriting position*, a *firm* may use an over-allotment option granted to it by the issuer of the *securities* being *underwritten* to reduce the short *positions* in (1).
- (3) A *firm* may also use an over-allotment option granted to another member of the *underwriting* syndicate for the purpose in (2).
- (4) (2) and (3) only apply from *working day 0*.
- (5) (2) and (3) only apply to the extent that the treatment is consistent with the terms of the over-allotment option.

- 7.8.22 **R** Except as provided in **■ BIPRU 7.8.21R**, a *firm* must not take into account an over-allotment option granted to it or another member of the *underwriting* syndicate in calculating its *net underwriting position*.

Working day 0

- 7.8.23 **R** For the purposes of **■ BIPRU 7.8** *working day 0* is the *business day* on which a *firm* that is *underwriting* or *sub-underwriting* becomes unconditionally committed to accepting a known quantity of *securities* at a specified price.
- 7.8.24 **G** For debt issues and *securities* which are issued in a similar manner, *working day 0* is the later of the date on which the *securities* are allotted and the date on which payment for them is due.
- 7.8.25 **G** For *equity* issues and *securities* which are issued in a similar manner, *working day 0* is the later of the date on which the offer becomes closed for subscriptions and the date on which the allocations are made public.
- 7.8.26 **G** For rights issues, *working day 0* is the first day after the date on which the offer becomes closed to acceptances for subscription.

Calculating the reduced net underwriting position

- 7.8.27 **R** To calculate the *reduced net underwriting position* a *firm* must apply the reduction factors in the table in **■ BIPRU 7.8.28R** to the *net underwriting position* (calculated under **■ BIPRU 7.8.17R**) as follows:
- (1) in respect of debt *securities*, a *firm* must calculate two *reduced net underwriting positions*; one for inclusion in the *firm's interest rate PRR specific risk* calculation (**■ BIPRU 7.2.43R**), the other for inclusion in its *interest rate PRR general market risk* calculation (**■ BIPRU 7.2.52R**); and

(2) in respect of equities, a firm must calculate only one reduced net underwriting position, and then include it in the simplified equity method (see ■ BIPRU 7.3.29R).

7.8.28 **R** Table: Net underwriting position reduction factors

This table belongs to ■ BIPRU 7.8.27R

Underwriting timeline	Debt		Equity
	General market risk	Specific risk	
Time of initial commitment until working day 0	0%	100%	90%
Working day 1	0%	90%	90%
Working day 2	0%	75%	75%
Working day 3	0%	75%	75%
Working day 4	0%	50%	50%
Working day 5	0%	25%	25%
Working day 6 and onwards	0%	0%	0%

7.8.29 **G** The table in ■ BIPRU 7.8.30G gives an example of the reduced net underwriting position calculation. The example is based on the firm starting with a commitment to underwrite £100 million of a new equity issue. Firms are reminded that in the case of an equity, the reduced net underwriting position should be treated under the simplified equity method (see ■ BIPRU 7.8.27R (Simplified and standard equity methods) and ■ BIPRU 7.8.27R).

7.8.30 **G** Table: Example of the reduced net underwriting position calculation

This table belongs to ■ BIPRU 7.8.29G

Time	Net underwriting position (see BIPRU 7.8.17R)		Percentage reduction (see BIPRU 7.8.28R)	Reduced net underwriting position	
At initial commitment 9.00am Monday	£100m gross amount is reduced by £20m due to sales/sub-underwriting commitments confirmed in writing at the time of initial commitment (see BIPRU	=	£80m	90%	£8m

Time	Net underwriting position (see BIPRU 7.8.17R)	Percentage reduction (see BIPRU 7.8.28R)	Reduced net underwriting position	
	7.8.17R (1) and (4)).			
Post initial commitment 9.02am Monday	Remaining £80m is reduced by £40m due to further sales, sub-underwriting commitments obtained and allocations granted (see BIPRU 7.8.17R (2) - (5)). =	£40m	90%	£4m
At the end of working day 1	Remaining £40m is reduced to £20m due to further sales. =	£20m	90%	£2m
End of working day 3	Remaining £20m is reduced to £5m due to further sales. =	£5m	75%	£1.25 m
End of working day 4	Remaining £5m is reduced to £2m due to further sales. =	£2m	50%	£1m
End of working day 5	Remaining £2m is reduced to £1m due to further sales. =	£1m	25%	£0.75 m
Start of working day 6	£1m remaining =	£1m	0%	£1m

Large exposure risk from underwriting securities: Calculating the net underwriting exposure

7.8.31

R

For the purposes of calculating the total amount of its *trading book exposures* to a *person* for concentration risk purposes, a *firm* must include *net underwriting exposure* to that *person*.

7.8.32 **R** A firm must include any other exposures arising out of underwriting (including any counterparty exposures to any sub-underwriters) for the purposes of calculating the total amount of its trading book exposures to a person for concentration risk purposes.

7.8.33 **R** [deleted]

7.8.34 **R** Except where otherwise specified by a requirement on its Part 4A permission, a firm must calculate the net underwriting exposure to an issuer by applying the relevant reduction factors in the table in ■ BIPRU 7.8.35R to its net underwriting position calculated under ■ BIPRU 7.8.17R.

7.8.35 **R** Table: Calculation of net underwriting exposure

This table belongs to ■ BIPRU 7.8.34R

Time	Reduction factor to be applied to net underwriting position
Initial commitment to working day 0	100%
Working day 0	100%
Working day 1	90%
Working day 2	75%
Working day 3	75%
Working day 4	50%
Working day 5	25%
Working day 6 onwards	0%

7.8.36 **G** The effect of ■ BIPRU 7.8.34R is that there is no concentration limit for net underwriting exposures between initial commitment and the end of working day 0, except where specified by a requirement on a firm's Part 4A permission.

Large exposure risk from underwriting securities: Monitoring and reporting concentration risk

7.8.37 **R** For the purposes of concentration risk monitoring only, a firm must report its net underwriting exposure both before and after the application of the reduction factors in the table in ■ BIPRU 7.8.35R.

Risk management

7.8.38 **R** A firm must take reasonable steps to establish and maintain such systems and controls to monitor and manage its underwriting and sub-underwriting business as are appropriate to the nature, scale and complexity of its underwriting and sub-underwriting business. In particular, a firm must have systems to monitor and control its underwriting exposures between the time of the initial commitment and working day one in the light of the nature of the risks incurred in the markets in question.

7.8.39

G

A *firm* should take reasonable steps to:

- (1) allocate responsibility for the management of its *underwriting* and *sub-underwriting* business;
- (2) allocate adequate resources to monitor and control its *underwriting* and *sub-underwriting* business;
- (3) satisfy itself that its systems to monitor *exposure* to counterparties will calculate, revise and update its *exposure* to each counterparty arising from its *underwriting* or *sub-underwriting* business;
- (4) satisfy itself of the suitability of each *person* who performs functions for it in connection with the *firm's underwriting* and *sub-underwriting* business having regard to the *person's* skill and experience; and
- (5) satisfy itself that its procedures and controls to monitor and manage its *underwriting* business address, on an on-going basis, the capacity of *sub-underwriters* to meet *sub-underwriting* commitments.

7.9 Use of a CAD 1 model

Introduction

- 7.9.1** **G** A firm is required under ■ GENPRU 2.1.52 R (Calculation of the *market risk capital requirement*) to calculate its *market risk capital requirement* using the rules in ■ BIPRU 7. However, the *appropriate regulator* may at the firm's request modify ■ GENPRU 2.1.52 R to allow the firm to calculate all or part of the *PRR* for the *positions* covered by that model by using a *CAD 1 model* (for *options* risk aggregation and/or interest rate pre-processing) or a *VaR model* (value at risk model) instead. ■ BIPRU 7.10 (Use of a Value at Risk Model) deals with *VaR model permissions*.
- 7.9.2** **G** The purpose of ■ BIPRU 7.9 is to provide *guidance* on the *appropriate regulator's* policy for granting *CAD 1 model waivers* under section 138A of the Act (Modification or waiver of rules). The policy recognises that *CAD 1 models* may vary across firms but, as a minimum, the *appropriate regulator* will need to be satisfied:
- (1) about the quality of the internal controls and risk management relating to the model (see ■ BIPRU 7.9.19G - ■ BIPRU 7.9.23G for further details);
 - (2) about the quality of the model standards; and
 - (3) that the *CAD 1 model* captures and produces an accurate measure of the risks inherent in the portfolio covered by the *CAD 1 model* (see ■ BIPRU 7.9.25G - ■ BIPRU 7.9.53G for further details).
- 7.9.3** **G** ■ BIPRU 7.9 also explains how the output from the *CAD 1 model* is fed into the *market risk capital requirement* calculation.
- 7.9.4** **G** If a *CAD 1 model waiver* is granted by the *appropriate regulator*, the *waiver* will contain certain requirements. In order adequately to address individual circumstances, these may differ from what is set out in ■ BIPRU 7.9. The *waiver* will also identify the *rules* to which the *waiver* applies and the scope of model recognition granted to the firm.
- 7.9.5** **G** *Waivers* permitting the use of models in the calculation of *PRR* will not be granted if that would be contrary to *BIPRU*. When granting any '*waivers*' the *FCA* will have regard to the *CAD*. Accordingly, the only *waivers* permitting the use of models in calculating *PRR* that the *appropriate regulator* is likely to grant are *CAD 1 model waivers* and *VaR model permissions*.

Scope of CAD 1 models

7.9.6 G The *appropriate regulator* recognises two types of *CAD 1 model*. The table in ■ BIPRU 7.9.7G describes them.

7.9.7 G Table: Types of CAD 1 model

This table belongs to ■ BIPRU 7.9.6G

	Options risk aggregation models	Interest rate pre-processing models
Brief description and eligible instruments	Analyse and aggregate <i>options</i> risks for: <ul style="list-style-type: none"> • interest rate <i>options</i>; • equity <i>options</i>; • foreign currency <i>options</i>; • commodity <i>options</i>; and <ul style="list-style-type: none"> • <i>CIU options</i>. 	May be used to calculate duration weighted <i>positions</i> for: <ul style="list-style-type: none"> • interest rate <i>futures</i>; • forward rate agreements (<i>FRAs</i>); • forward commitments to buy or sell debt securities; • <i>options, swaps</i> or <i>warrants</i> on interest rates or debt securities and <i>options</i> on such <i>swaps</i>; • amortising bonds; • equity <i>futures, forwards, warrants</i> and <i>options</i> (but only in relation to the interest rate risk inherent in these products); and • foreign currency <i>futures, forwards, swaps</i> and <i>options</i>, but only in relation to the interest rate risk inherent in these products.
The output and how it is used in the <i>PRR</i> calculation	Depending on the type of model and the requirements in the <i>CAD 1 model waiver</i> granted, the outputs from an <i>options</i> risk aggregation model are used as an input to the <i>market risk capital requirement</i> calculation.	Depending on the type of model and the requirements in the <i>CAD 1 model waiver</i> granted, the individual sensitivity figures produced by this type of <i>CAD 1 model</i> are either input into the calculation of <i>interest rate PRR</i> under the <i>interest rate duration method</i> (see BIPRU 7.2.63R) or are converted into notional <i>position</i> and input into the calculation of <i>interest rate PRR</i> under the <i>interest rate maturity method</i> (see BIPRU 7.2.59R).

- 7.9.8** **G** Currently the *appropriate regulator* only envisages allowing recognition for *options* on *CIUs* if the *CIU* satisfies one of the following conditions:
- (1) it is a *regulated collective investment scheme*; or
 - (2) the *firm* can demonstrate that it has characteristics that are similar to or better than an *undertaking* in (1) from the point of view of transparency and liquidity.
- The CAD 1 model waiver application and review process**
- 7.9.9** **G** Details of the general *waiver* process are set out in **■ SUP 8** (Waiver and modification of rules). Further details of the *waiver* process applicable to certain *waivers* relating to BIPRU (including *CAD 1 model waivers*) can be found in **■ BIPRU 1.3** (Applications for advanced approaches). Because of the complexity of a *CAD 1 model waiver*, it is recommended that, as set out in **■ SUP 8.3.4 G** and **■ BIPRU 1.3.21 G**, a *firm* contact its usual contact at the *appropriate regulator* to discuss its proposed application. It should also be noted that the *waiver* recognition process in the case of a *CAD 1 model* may take longer than the timescales indicated in **■ SUP 8.3.5 G**.
- 7.9.10** **G** In order to consider a *CAD 1 model waiver* request, the *appropriate regulator* may undertake a review to ensure that it is adequate and appropriate for the *PRR* calculation.
- 7.9.11** **G** The model review process may be conducted through a series of visits covering various aspects of the *firm's* control and IT environment. Before these visits the *appropriate regulator* may ask the *firm* to provide some information relating to its *waiver* request accompanied by some specified background material. The model review visits are organised on a timetable that allows a *firm* being visited sufficient time to arrange the visit and provide the appropriate pre-visit information.
- 7.9.12** **G** As part of the model review process, the following may be reviewed: organisational structure and personnel; details of the *firm's* market position in the relevant products; profit and risk information; valuation and reserving policies; operational controls; IT systems; model release and control procedures; risk management and control framework; risk appetite and limit structure and future developments relevant to model recognition.
- 7.9.13** **G** The *appropriate regulator* will normally require meetings with senior management and staff from the front office, financial control, risk management, operations, systems development, information technology and audit areas.
- 7.9.14** **G** A review by a *skilled person* may be used before a *CAD 1 model waiver* is granted to supplement the *waiver* process or after the *waiver* has been granted to review the *CAD 1 model*.
- 7.9.15** **G** If the *appropriate regulator* grants a *CAD 1 model waiver*, the *waiver* direction will specify the particular *rule* which has been modified, and set

out the requirements subject to which the *waiver* has been granted. These requirements may include:

- (1) the details of the calculation of *PRR*;
- (2) the *CAD 1 model waiver* methodology to be employed;
- (3) the products covered by the model (e.g. *option* type, maturity, currency); and
- (4) any notification requirements relating to the *CAD 1 model waiver*.

7.9.16 **G** Where a *firm* operates any part of its *CAD 1 model* outside the *United Kingdom*, the *appropriate regulator* may take into account the results of any review of that model carried out by any overseas regulator concerned. The *appropriate regulator* may wish to receive information directly from that regulator.

Maintenance of model recognition

7.9.17 **G** No changes should be made to a *CAD 1 model* unless the change is not material. Material changes to a *CAD 1 model* will require a renewed *waiver* to be issued. Materiality is measured from the time that the *waiver* is granted or, if the *waiver* has been varied in accordance with section 138A of the *Act*, any later time that may be specified in the *waiver* for these purposes. If a *firm* is considering making material changes to its *CAD 1 model*, then it should notify the *appropriate regulator* at once. If a *firm* wishes to change the products covered by the model it should apply for a variation of its *CAD 1 model waiver*.

7.9.18 **G** If the *CAD 1 model* ceases to meet the requirements of the *waiver*, the *firm* should notify the *appropriate regulator* at once. The *appropriate regulator* may then revoke the *waiver* unless it is varied in accordance with section 138A of the *Act*. If the *CAD 1 model waiver* contains conditions it is a condition of using the *CAD 1 model approach* that the *firm* should continue to comply with those conditions.

Risk management standards

7.9.19 **G** A *firm* with a complex portfolio is expected to demonstrate more sophistication in its modelling and risk management than a *firm* with a simple portfolio.

7.9.20 **G** A *firm* should be able to demonstrate that the risk management standards set out in ■ BIPRU 7.9 are satisfied by each legal entity with respect to which the *CAD 1 model approach* is being used (even though they are expressed to refer only to a *firm*). This is particularly important for *subsidiary undertakings* in *groups* subject to matrix management where the business lines cut across legal entity boundaries.

7.9.21 **G** (1) A *firm* should have a conceptually sound risk management system which is implemented with integrity and should meet the minimum standards set out in this paragraph.

- (2) A *firm* should have a risk control unit that is independent of business trading units and reports directly to senior management. The unit should be responsible for designing and implementing the *firm's* risk management system. It should produce and analyse daily reports on the risks run by the business and on the appropriate measures to be taken in terms of the trading limits.
- (3) A *firm's* senior management should be actively involved in the risk control process and the daily reports produced by the risk control unit should be reviewed by a level of management with sufficient authority to enforce reductions of *positions* taken by individual traders as well as in the *firm's* overall risk exposure.
- (4) The risk control group should have a sufficient number of staff with appropriate skills in the use of models.
- (5) A *firm* should have established procedures for monitoring and ensuring compliance with a documented set of appropriate internal policies and controls concerning the overall operation of the risk measurement and control framework. This should take into account the front, middle and back office functions.
- (6) A *firm* should conduct, as part of its regular internal audit process, a review of the systems and controls relating to its *CAD 1 model*. This review should include the valuation process, compliance with the *CAD 1 model waiver's* scope and the activities of the business trading units and the risk control units. This review should be undertaken by staff independent of the areas being reviewed.

7.9.22

G

In assessing whether the risk management and control framework is implemented with integrity, the *appropriate regulator* will consider the IT systems used to run the *CAD 1 model* and associated calculations. The assessment will include, where appropriate:

- (1) feeder systems; risk aggregation systems; the integrity of the data (i.e. whether it is complete, coherent and correct); reconciliations and checks on completeness of capture; and
- (2) system development, change control and documentation; security and audit trails; system availability and contingency procedures; network adequacy.

7.9.23

G

A *firm* should take appropriate steps to ensure that it has adequate controls relating to:

- (1) the derivation of the *PRR* from the *CAD 1 model* output;
- (2) *CAD 1 model* development, including independent validation;
- (3) reserving;
- (4) valuation (see ■ GENPRU 1.3 (Valuation)), including independent validation; and
- (5) the adequacy of the IT infrastructure.

Model standards

- 7.9.24 **G** A *firm* should take appropriate steps to ensure that its *CAD 1 model* captures and produces an accurate measure of the risks inherent in the portfolio covered by the *CAD 1 model*. These risks may include, but are not limited to, gamma, vega and rho.

Options risk aggregation models

- 7.9.25 **G** For a *firm* to obtain a *CAD 1 model waiver* for its *options* risk aggregation model, it should have in place an appropriate *options* valuation model.
- 7.9.26 **G** The *appropriate regulator* does not specify the methodology that a *firm* should employ in order to produce the appropriate outputs from its *options* risk aggregation *CAD 1 model*. However, ■ BIPRU 7.9.27G - ■ BIPRU 7.9.43G provide details of how a *firm* could meet the requirement to capture gamma, vega and rho risks using a scenario matrix approach. Where a *firm* adopts the scenario matrix approach then the standards set out in ■ BIPRU 7.9.27G - ■ BIPRU 7.9.43G should be followed. The *firm* should also take into account other risks not captured by the scenario matrix approach. If a *firm* does not use the scenario matrix approach it should use an equivalent methodology. If a *firm* uses an equivalent methodology it should be able to demonstrate that the approach used meets the requirements of ■ BIPRU 7.9.
- 7.9.27 **G** A scenario matrix is an approach by which an *options* portfolio is revalued given a number of simultaneous shifts in both the spot level of the underlying and the implied volatility.
- 7.9.28 **G** The scenario matrix approach may be employed for all types of *options* on all types of underlying asset.
- 7.9.29 **G**
- (1) This paragraph provides an outline of the initial steps to be taken when using the scenario matrix approach.
 - (2) A value for an *option* should be obtained using the *firm's options* valuation model.
 - (3) The inputs into the *options* valuation model for implied volatility of the underlying asset and the price of the underlying asset should then be altered so that a new value for the *option* is obtained (details of the amount by which the implied volatility and the price of the underlying should be amended are set out in ■ BIPRU 7.9.30G - ■ BIPRU 7.9.36G).
 - (4) The difference between the original value of the *option* and the new value obtained following the alterations should be input into the appropriate cell in the matrix. The value in the central cell where there is no change in implied volatility or price of the underlying should therefore be zero.
 - (5) The process of obtaining a new price for the *option* should be repeated until the matrix is completed.

7.9.30 **G** The alteration to the implied volatility (known as the implied volatility shift) referred to in **■ BIPRU 7.9.29G (3)** may be a proportional shift. The size of the shift depends on the remaining life of the *option* and the asset class of the underlying. The table in **■ BIPRU 7.9.32G** sets out the shifts that should be applied where a proportional shift is used. Alternatively, a *firm* may use a single shift across all maturities or use an absolute rather than a proportional implied volatility shift. Where a single shift or an absolute shift is used it should be at least as conservative as the proportional shifts. Any use of a single shift or an absolute shift should be reviewed and, if necessary updated, on a regular basis.

7.9.31 **G** A *firm* may choose to use a less detailed term structure than that in the table in **■ BIPRU 7.9.32G**, but the shifts used should be no less conservative than those set out in that table. For example, a *firm* that uses one <3 month band, rather than the two bands (≤ 1 month and 1-3 months) set out in the table, should use the most conservative shift set out in the table for the bands covered. In this example that shift is 30%.

7.9.32 **G** Table: proportional implied volatility shifts

This table belongs to **■ BIPRU 7.9.30G**

Remaining life of option	Proportional shift	
	<i>Equities, foreign currency and commodities</i>	Interest rates and <i>CIUs</i>
≤ 1 month	30%	30%
$> 1 \leq 3$ months	20%	20%
$> 3 \leq 6$ months	15%	15%
$> 6 \leq 9$ months	12%	12%
$> 9 \leq 12$ months	9%	9%
$> 1 \leq 2$ years	6%	9%
$> 2 \leq 4$ years	4.5%	9%
> 4 years	3%	9%

7.9.33 **G** The size of the underlying price/rate shift depends on the asset class of the underlying as referred to in **■ BIPRU 7.9.29G (3)** and is set out in the table in **■ BIPRU 7.9.34 G**.

7.9.34 **G** Table: underlying price/rate shifts

This table belongs to **■ BIPRU 7.9.33G**

Underlying asset class	Shift
<i>Equities</i>	$\pm 8\%$
<i>Foreign currency</i>	$\pm 8\%$
<i>Commodities</i>	$\pm 15\%$, (but a <i>firm</i> may use the percentages applicable under the <i>commodity extended maturity ladder approach</i> if it would qualify under BIPRU 7.4 (Commodity PRR) to use that approach).

Underlying asset class	Shift
Interest rates	±100bp (but a <i>firm</i> may use the sliding scale of shifts by maturity as applicable to the <i>interest rate duration method</i>).
<i>CIU</i>	±32%, (but a <i>firm</i> may use the percentages applicable to the underlyings if the <i>firm</i> applies one of the <i>CIU look through methods</i> under BIPRU 7.7 (Position risk requirements for collective investment undertakings)).

7.9.35 G The shifts outlined in the table in ■ BIPRU 7.9.34G are the maximum shifts required; in addition there will be a number of intermediate shifts as a result of the minimum matrix size criteria set out in ■ BIPRU 7.9.36G.

7.9.36 G The minimum size of the scenario matrix should be 3x7, that is, three observations for implied volatility (including the actual implied volatility) and seven observations for the price of the underlying (including the actual price of the underlying). A *firm* should be able to justify its choice of granularity. Greater granularity may be required where the portfolio contains, for example, a large proportion of barrier *options*.

7.9.37 G

- (1) A different scenario matrix should be set up for each underlying asset type in accordance with this paragraph.
- (2) For *equities* (including single *equities*, baskets and indices) there should be a separate matrix for each national market or non-decomposed basket or non-decomposed multi-national index.
- (3) For *foreign currency* products there should be a separate matrix for each currency pair where appropriate.
- (4) For *commodity* products there should be a separate matrix for each *commodity*. The question whether two items are the same *commodity* should be decided in accordance with ■ BIPRU 7.4 (Commodity PRR).
- (5) For interest rate products there should be a separate matrix for each currency. In addition, a *firm* should not offset the gamma and vega exposures (except in the circumstances set out in ■ BIPRU 7.9.38G) arising from any one of the following types of product with the gamma and vega exposures arising from any of the other products in the list:
 - (a) swaptions (*options* on interest rates);
 - (b) interest rate *options* (including *options* on exchange-traded deposit or bill *futures*);
 - (c) bond *options* (including *options* on exchange-traded bond *futures*); and
 - (d) other types of *options* required by the *CAD 1* model *waiver* to form their own separate class of underlying asset.

(6) The other types of *options* referred to in (5)(d) will generally be exotic *options* that do not fall easily into (5)(a) - (c)).

(7) For *CIUs* there should be a separate matrix for each *CIU* fund. If the *firm* applies one of the *CIU look through methods* under ■ BIPRU 7.7 (Position risk requirements for collective investment undertakings), then (1) - (6) apply based on what the underlyings are.

- 7.9.38** **G** A *firm* may offset gamma and vega exposures arising from the products listed in ■ BIPRU 7.9.37G (5) where it can demonstrate that it trades different types of interest rate-related *options* as a portfolio and takes steps to control the basis risk between different types of implied volatility. To the extent that this is the case an individual matrix is not required for each of the products listed in ■ BIPRU 7.9.37G (5) and a combined scenario matrix may be used.
- 7.9.39** **G** Where it is imprudent fully to offset long-dated and short-dated vega exposure owing to the risk of non-parallel shifts in the yield curve, a *firm* should use an appropriate number of scenario matrices to take account of non-parallel shifts in the yield curve according to the maturity of the *option* or underlying.
- 7.9.40** **G** Following the steps outlined in ■ BIPRU 7.9.29G, a *firm* then removes the portion of the values in the matrix that can be attributed to the effect that delta has had on the change in the value of the *option* (a process known as delta-stripping).
- 7.9.41** **G** Once the effect of delta has been removed from the matrix, the values left in the matrix relate to gamma and vega risk. A *firm's PRR* in relation to gamma and vega risk on the individual *option* is the absolute of the most negative cell in the scenario matrix produced. Where all cells are positive the *PRR* is zero. The total *PRR* for the gamma and vega risk on the portfolio of *options* is a simple sum of the individual requirements. This amount should then be fed into a *firm's PRR* calculation.
- 7.9.42** **G** The values that have been obtained for the delta-equivalent *positions* of instruments included in the scenario matrix should then be treated in the same way as *positions* in the underlying. Where the delta obtained relates to interest rate *position* risk, the delta equivalent *positions* may be fed into the *firm's* interest rate pre-processing model to the extent that the *positions* fall within the scope of interest rate pre-processing models as set out in ■ BIPRU 7.9.7G and provided that the *firm's CAD 1 model waiver* allows the *firm's CAD 1 model* to be used in this way. Alternatively, the delta obtained should be fed into the standard *PRR* calculations in ■ BIPRU 7.2 (Interest rate *PRR*), ■ BIPRU 7.3 (Equity *PRR* and basic interest rate *PRR* for equity derivatives), ■ BIPRU 7.4 (Commodity *PRR*) or ■ BIPRU 7.5 (Foreign currency *PRR*) as appropriate.
- 7.9.43** **G** In using the scenario matrix approach, none of the steps followed will take specific account of a *firm's* exposure to rho risk. Where a *firm* can demonstrate that for interest rate-related *options* the rho sensitivity is effectively included in the delta sensitivities produced, there is no separate capital requirement relating to rho. For all other *options* except *commodity*

options, a firm should calculate a rho sensitivity ladder by currency using its CAD 1 model and either feed this into the interest rate maturity method or interest rate duration method calculation or, where the firm's CAD 1 model waiver allows the firm's CAD 1 model to be used in this way, feed that ladder into an interest rate pre-processing model. Generally a CAD 1 model does not need to deal specifically with rho risk for commodity options.

Interest rate pre-processing models

7.9.44 **G** To the extent that a firm's CAD 1 model waiver is for the use of an interest rate pre-processing model the firm should use it for the pre-processing of the instruments set out in ■ BIPRU 7.9.7G, from which the residual positions are fed into the interest rate maturity method or interest rate duration method calculation.

7.9.45 **G** There are a number of different methods of constructing pre-processing models but all should comply with ■ BIPRU 7.9.45G - ■ BIPRU 7.9.53G. All pre-processing models should generate positions that have the same sensitivity to defined interest rate changes as the underlying cash flows.

7.9.46 **G** In an interest rate pre-processing model each transaction is converted into its constituent cash flows. The cash flows are discounted using zero coupon rates derived from the firm's own yield curves.

7.9.47 **G** The cash flows are then calculated again using the firm's own yield curve shifted by the amount set out in ■ BIPRU 7.9.49G.

7.9.48 **G** The difference between the present values calculated using the firm's own yield curve and those calculated using the firm's curve shifted under ■ BIPRU 7.9.47G are known as the sensitivity figures. Alternatively, a firm may shift the yield curve by one basis point and multiply up the sensitivity figures by the appropriate amount in order to achieve the shifts set out in ■ BIPRU 7.9.47G. These sensitivity figures are then allocated to each of the 15 maturity bands set out in ■ BIPRU 7.9.49G.

7.9.49 **G** Table: yield curve shifts

This table belongs to ■ BIPRU 7.9.47G

Zone	Modified duration	Assumed interest rate change (percentage points)
1	0 ≤ 1 months	1.00
	> 1 ≤ 3 months	1.00
	> 3 ≤ 6 months	1.00
	> 6 ≤ 12 months	1.00
2	> 1.0 ≤ 1.9 years	0.90
	> 1.9 ≤ 2.8 years	0.85
	> 2.8 ≤ 3.6 years	0.85
3	> 3.6 ≤ 4.3 years	0.75

Zone	Modified duration	Assumed interest rate change (percentage points)
3	> 4.3 ≤ 5.7 years	0.70
	> 5.7 ≤ 7.3 years	0.70
	> 7.3 ≤ 9.3 years	0.70
	> 9.3 ≤ 10.6 years	0.70
	> 10.6 ≤ 12 years	0.70
	> 12.0 ≤ 20 years	0.70
	> 20 years	0.70

- 7.9.50** **G** Sensitivity figures calculated by a *firm* using an interest rate pre-processing model are usually produced in the format of a net sensitivity by maturity bucket or by discrete gridpoint. These maturity buckets or gridpoints should then be allocated to the 15 bands set out in ■ BIPRU 7.9.49G. The number of maturity buckets or gridpoints used to represent a yield curve can be referred to as granularity. The granularity should always be adequate to capture the material curve risk in the portfolio. Curve risk can be defined as the risk associated with holding long and short *positions* at different points along the yield curve.
- 7.9.51** **G** Positive and negative amounts placed in each of the different maturity bands in ■ BIPRU 7.9.49G under the sensitivity calculation in ■ BIPRU 7.9.50G should then be netted off to produce one figure for each of the bands. There is no capital requirement for this netting process.
- 7.9.52** **G** The individual sensitivity figures produced should then be input into the *interest rate duration method* calculation. The individual sensitivity figures for each band should be included with the other *positions* in the appropriate column in the table in ■ BIPRU 7.2.65R (Table: Assumed interest rate change in the interest rate duration method).
- 7.9.53** **G** Instead of using the approach in ■ BIPRU 7.9.52G a *firm* may use an approach based on the *interest rate maturity method*, making appropriate adjustments to the sensitivity figures.

7.10 Use of a Value at Risk Model

Application

- 7.10.1 **R** ■ BIPRU 7.10 applies to a *firm* with a *VaR model permission*.

Introduction and purpose

- 7.10.2 **G** ■ BIPRU 7.10 provides details of when the *appropriate regulator* expects to allow a *firm* to use a *VaR model* (value at risk model) for the purpose of calculating part or all of its *PRR*. It introduces the concept of a *VaR model*, the methodology behind it and the link to the *standard market risk PRR rules*. It then goes on to detail the application and review process. The bulk of ■ BIPRU 7.10 specifies the model standards and risk management standards that *firms* will be required to meet in order to use a *VaR model*. It further stipulates requirements for stress testing, backtesting, capital calculations and finally the reporting standards expected by the *appropriate regulator*.
- 7.10.3 **G** The models described in ■ BIPRU 7.10 are described as *VaR models* in order to distinguish them from *CAD 1 models*, which are dealt with in ■ BIPRU 7.9 (Use of a *CAD 1 model*). A *VaR model* is a risk management model which uses a statistical measure to predict profit and loss movement ranges with a confidence interval. From these results *PRR charges* can be calculated. The standards described in ■ BIPRU 7.10, and which will be applied by the *appropriate regulator*, are based on Annex V of the *Capital Adequacy Directive*.
- 7.10.4 **G** The aim of the *VaR model approach* is to enable a *firm* with adequate risk management systems to be subject to a *PRR* requirement that is more closely aligned with the risks to which it is subject than the *PRR* requirements generated by the *standard market risk PRR rules*. This provides a *firm* with an incentive to measure market risks as accurately and comprehensively as possible. It is crucial that those responsible for managing *market risk* at a *firm* should be aware of the assumptions and limitations of the *firm's VaR model*.
- 7.10.5 **G** There are a number of general methodologies for calculating *PRR* using a *VaR model*. The *appropriate regulator* does not prescribe any one method of computing *VaR* measures. Moreover, it does not wish to discourage any *firm* from developing alternative risk measurement techniques. A *firm* should discuss the use of any alternative techniques used to calculate *PRR* with the *appropriate regulator*.

7.10.6 **G** A firm should not use the *VaR model approach* to calculate *PRR* unless it has a *VaR model permission*. If a firm does not have such a permission it should use the *standard market risk PRR rules*. Therefore, a firm needs to apply for a *VaR model permission* in order to calculate its *PRR* using a *VaR model* instead of (or in combination with) the *standard market risk PRR rules*.

Conditions for granting a VaR model permission

7.10.7 **G** A waiver or other permission allowing the use of models in the calculation of *PRR* will be considered with regards to *CAD* and any *VaR model permission* which is granted will be considered with regards to *CAD*. Accordingly, the *appropriate regulator* is likely only to grant a waiver or other permission allowing the use of models in the calculation of *PRR* if it is a *VaR model permission* or a *CAD 1 model waiver*.

7.10.8 **G** ■ BIPRU 7.10 sets out the minimum standards that the *appropriate regulator* expects firms to meet before granting a *VaR model permission*. The *appropriate regulator* will not grant a *VaR model permission* unless it is satisfied that the requirements of ■ BIPRU 7.10 are met and it is satisfied about the procedures in place at a firm to calculate the model *PRR*. In particular the *appropriate regulator* will not normally grant a *VaR model permission* unless it is satisfied about the quality of:

- (1) the internal controls and risk management relating to the *VaR model* (see ■ BIPRU 7.10.56G - ■ BIPRU 7.10.82R);
- (2) the *VaR model* standards (see ■ BIPRU 7.10.24R-■ BIPRU 7.10.55G); and
- (3) stress testing and backtesting procedures relating to a *VaR model* (see, in addition to (2), ■ BIPRU 7.10.83R - ■ BIPRU 7.10.112G).

7.10.9 **G** The *appropriate regulator* recognises that the nature of *VaR models* will vary between firms. The scope of and the requirements and conditions set out in a *VaR model permission* may therefore differ in substance or detail from ■ BIPRU 7.10 in order to address individual circumstances adequately. The *FCA* will consider any differences by having regard to the *CAD*. A *VaR model permission* will implement any such variation by modifying ■ BIPRU 7.10. A *VaR model permission* may also include additional conditions to meet the particular circumstances of the firm or the model.

The VaR model permission application and review process

7.10.10 **G** Details of the general process for applying for a *VaR model permission* are set out in ■ BIPRU 1.3 (Applications for advanced approaches). Because of the complexity of a *VaR model permission*, it is recommended that a firm discuss its proposed application with its usual contact at the *appropriate regulator* before it makes the application.

7.10.11 **G** In order for a *VaR model permission* to be granted, the *appropriate regulator* is likely to undertake a review to ensure that it is adequate and appropriate for the *PRR* calculation.

7.10.12 **G** The *VaR model* review process may be conducted through a series of visits covering various aspects of a *firm's* control and IT environment. Before these visits the *appropriate regulator* may ask the *firm* to provide some information relating to the *firm's VaR model permission* request accompanied by some specified background material. The *VaR model* review visits are organised on a timetable that allows the *firm* being visited sufficient time to arrange the visit and provide the appropriate pre-visit information.

7.10.13 **G** As part of the process for dealing with an application for a *VaR model permission* the following may be reviewed: organisational structure and personnel; details of the *firm's* market position in the relevant products; revenue and risk information; valuation and reserving policies; operational controls; information technology systems; model release and control procedures; risk management and control framework; risk appetite and limit structure; future developments relevant to model recognition.

7.10.14 **G** A visit will usually involve the *appropriate regulator* wishing to meet senior management and staff from the front office, financial control, risk management, operations, systems development, information technology and internal audit areas.

7.10.15 **G** The *appropriate regulator* may complement its own review of a *VaR model* permission request with one or more reviews by a skilled person under section 166 of the Act (Reports by skilled persons). Such a review may also be used where a *VaR model* permission has been granted to ensure that the requirements ■ BIPRU 7.10 and of the *VaR model* permission continue to be met.

Conditions for a VaR model outside the United Kingdom

7.10.16 **G** Where a *VaR model* used outside the *United Kingdom* differs from that used in the *United Kingdom* the *appropriate regulator* may request details of the reasons for using different models.

7.10.17 **G** Where a *firm* operates any part of its *VaR model* outside the *United Kingdom*, the *appropriate regulator* may take into account the results of the home supervisor's review of that model. The *appropriate regulator* may wish to receive information directly from the home supervisor.

Scope of VaR models

7.10.18 **R** A *firm* must use the *VaR model approach* to calculate the *PRR* for a *position*:

- (1) to the extent that the risks in relation to that *position* are within the scope of the *VaR model permission* (see ■ BIPRU 7.10.136R (Link to standard *PRR* rules: Incorporation of the model output into the capital calculation)); and
- (2) if the *position* is of a type that comes within the scope of the *VaR model permission*.

- 7.10.19** **G** In accordance with **■ BIPRU 7.10.18R (1)** a *VaR model permission* will set out the risk categories that it covers, which are expected to be one or more of the following types:
- (1) interest rate *general market risk*;
 - (2) interest rate *specific risk* (in conjunction with interest rate *general market risk*);
 - (3) *equity general market risk*;
 - (4) *equity specific risk* (in conjunction with *equity general market risk*);
 - (5) *CIU risk*;
 - (6) *foreign currency risk*; and
 - (7) *commodity risk*.
- 7.10.20** **G** A *VaR model permission* will generally set out the broad classes of *position* within its scope. It may also specify how individual products within one of those broad classes may be brought into or taken out of the scope of the *VaR model permission*.
- 7.10.21** **G** The broad classes of *position* referred to in **■ BIPRU 7.10.20G** are as follows:
- (1) linear products, which comprise *securities* with linear pay-offs (e.g. bonds and *equities*) and *derivative* products which have linear pay-offs in the underlying risk factor (e.g. interest rate *swaps*, *FRAs*, total return *swaps*);
 - (2) European, American and Bermudan put and call *options* (including caps, floors and swaptions) and *investments* with these features (see **■ BIPRU 7.6.18R** (Table: Option PRR: methods for different types of option) for an explanation of some of these terms);
 - (3) *Asian options*, *digital options*, *single barrier options*, *double barrier options*, *look back options*, *forward starting options*, *compound options* and *investments* with these features (see **■ BIPRU 7.6.18R** for an explanation of some of these terms); and
 - (4) all other *option* based products (e.g. *basket options*, *quantos*, *outperformance options*, *timing options*) and *investments* with these features (see **■ BIPRU 7.6.18R** for an explanation of some of these terms).
- 7.10.22** **G** The categorisation described in **■ BIPRU 7.10.21G** may be amended or replaced in the case of a particular *firm's VaR model permission*.
- 7.10.23** **G** It is the *appropriate regulator's* view that, where a *firm* uses a *VaR model* for one risk category as described in **■ BIPRU 7.10.19G**, it is good practice to extend its model over time to calculate all of its *PRR* risk categories. A *firm* will typically be expected to have a realistic plan in place to do this.

Model standards: General

7.10.24 **R** A *firm* must comply with the minimum standards set out in **■ BIPRU 7.10.26R** - **■ BIPRU 7.10.53R** in calculating the *model PRR*.

7.10.25 **G** The *appropriate regulator* accepts that the scope and nature of *VaR models* varies across *firms*. This means that different *firms* are likely to calculate different estimates of *market risk* for the same portfolio. Systematic differences are due to length of data series, choice of methodology (historical or Monte Carlo simulation or variance-covariance method or a hybrid of these), differences in aggregating risks within and across broad risk factors, the treatment of *options* and other non-linear products and the specification of risk factors.

Model standards: Frequency of calculations and confidence level

7.10.26 **R** The *model PRR* must be computed at least once every *business day*, using a 99% one-tailed confidence limit.

7.10.27 **G** A *firm* may meet the requirement in **■ BIPRU 7.10.26R** by using different model parameters and employing a suitable adjustment mechanism to produce a figure which is equivalent to the figure produced using the parameters set out in **■ BIPRU 7.10.26R**. For example, a *firm's* model may use a 95% one-tailed confidence limit if the *firm* has a mechanism to convert the output of the model to reflect a 99% one-tailed confidence limit.

7.10.27A **R** *Stressed VaR* must be calculated at least weekly, using a 99% one-tailed confidence limit.

Model standards: Holding period

7.10.28 **R** In calculating the *VaR number*, a *firm* must either use a ten *business day* holding period, or use a holding period converted to a ten *business day* holding period. However if the *firm's VaR model permission* specifies that the *firm* must use a specific method, the *firm* must do so.

7.10.29 **G** If a *firm* uses a holding period other than 10 *business days* and converts the resulting *VaR measure* to a ten *business day* equivalent measure, it should be able to justify the choice of conversion technique. For example, the square root of time method will usually be justifiable. The *appropriate regulator* considers it good practice ultimately to move towards the application of an actual ten *business day* holding period, rather than using different holding periods.

Model standards: Observation period

7.10.30 **R** Subject to **■ BIPRU 7.10.31R**, the calculation of *VaR numbers* must be based on an effective historical observation period that is the longest possible consistent with a prudent *VaR number*. That period must be at least one year or such longer period as may be set out in the *firm's VaR model permission*. However if using that prescribed observation period does not result in a sufficiently prudent way of calculating a *VaR measure* or a component of a

VaR measure the firm must shorten this observation period until the observation period is consistent with a prudent VaR number.

7.10.30A **R** The *stressed VaR* measure must be based on inputs calibrated to historical data from a continuous twelve-month period of significant financial stress relevant to the *firm's* portfolio. The choice of that historical period will be subject to the *appropriate regulator's* approval and will form part of a *firm's VaR model permission*.

7.10.30B **R** A *firm* must review the selection of the *stressed VaR* historical observation period at least annually.

Model standards: Data series

7.10.31 **R** A *firm* must ensure that the data series used by its *VaR model* is reliable. Where a reliable data series is not available, proxies or any other reasonable value-at-risk measurement technique must be used. A *firm* must be able to demonstrate that the technique is appropriate and does not materially understate the modelled risks.

7.10.32 **G** A data series is unreliable if it has, for example, missing data points, or data points which contain stale data. Reliable data series may be difficult to obtain for new products (for example an instrument of longer dated tenor that did not previously trade) and for less liquid risk factors or *positions*. With regard to less liquid risk factors or *positions*, a *firm* may use a combination of prudent valuation techniques and alternative *VaR* estimation techniques to ensure there is a sufficient cushion against risk over the close out period which takes account of the illiquidity of the risk factor or *position*.

7.10.33 **R**

- (1) If a weighting scheme or other similar method is used to calculate *VaR numbers*, then the effective observation period must be at least one year. Where a weighting scheme is used, the weighted average time lag of the individual observations must not be less than six *Months*.
- (2) If a specific observation period or weighted average time lag is specified in a *firm's VaR model permission*, the *firm* must comply with that if it is longer than the period specified in (1).
- (3) However, if a weighting scheme in (1) or (2) would result in imprudent *VaR numbers* then the weighting scheme must be adjusted so that it is consistent with a prudent *VaR number*.

7.10.34 **R** A *firm* must update data sets in accordance with the frequency set out in its *VaR model permission*. If volatility in market prices or rates necessitates more frequent updating in order to ensure a prudent calculation of the *VaR measure* the *firm* must do so.

7.10.35 **G** The minimum updating frequency for the current *VaR measure* that can be specified in a *VaR model permission* is monthly.

Model standards: Aggregation across risk categories

7.10.36 **R** The process for determining and implementing correlations within and across risk categories must be sound, implemented with integrity and consistent with the terms of the *firm's VaR model permission*.

7.10.37 **R** In aggregating *VaR measures* across risk or product categories, a *firm* must not use the square root of the sum of the squares approach unless the assumption of zero correlation between these categories is empirically justified. If correlations between risk categories are not empirically justified, the *VaR measures* for each category must simply be added in order to determine its aggregate *VaR measure*. But to the extent that a *firm's VaR model permission* provides for a different way of aggregating *VaR measures*:

(1) that method applies instead of this *rule*; and

(2) if the correlations between risk categories used for that purpose cease to be empirically justified then the *firm* must notify the *appropriate regulator* at once.

Model standards: Risk factors: Introduction

7.10.38 **G** Subject to **■ BIPRU 7.10.53R** (Model standards: Materiality), a *VaR model* should capture and accurately reflect all material risks arising on the underlying portfolio on a continuing basis insofar as those risks are within the scope of the *VaR model permission*. This should encompass *general market risk* and, to the extent that this comes within the scope of the *VaR model permission*, *specific risk*. A *firm* should ensure that the *VaR model* has sufficient risk factor granularity to be able to capture all such material risks and that these are properly documented and specified.

Model standards: Risk factors: General

7.10.39 **R** In the case of *general market risk* and risks with respect to which the *standard market risk PRR rules* do not distinguish between *general market risk* and *specific risk*, a *firm's VaR model* must capture a sufficient number of risk factors in relation to the level of activity of the *firm* and in particular the risks set out in **■ BIPRU 7.10.40R** - **■ BIPRU 7.10.44R**.

7.10.39A **R** A *firm* must incorporate risk factors that are included in its pricing model in its *VaR model*. A *firm's VaR model* must capture nonlinearities for *options* and other products, as well as correlation risk and *basis risk*. Where proxies for risk factors are used they must show a good track record for the actual *position* held. In addition, **■ BIPRU 7.10.40R** to **■ BIPRU 7.10.44R** apply for individual risk types.

7.10.39B **R** A *firm* with a *VaR model permission* must justify to the *appropriate regulator* any omissions of risk factors from its *VaR model*, if they are included in its pricing model.

7.10.40 **R** For interest rate risk, a *VaR model* must incorporate a set of risk factors corresponding to the interest rate curves in each currency in which the *firm* has interest rate sensitive *positions*. A *firm* must ensure that it captures the

variations of volatility of rates along the yield curve. In order to achieve this, a *firm* must divide the yield curves of, at a minimum, the major currencies and markets in which it has material interest rate exposures into a minimum of six maturity segments. The *VaR model* must also capture the risk of less than perfectly correlated movements between different yield curves.

- 7.10.41** **R** For *equity risk*, a *VaR model* must use a separate risk factor at least for each of the *equity* markets in which the *firm* has material *positions*.
- 7.10.42** **R** For *foreign currency risk*, a *VaR model* must incorporate risk factors corresponding to the individual *foreign currencies*, including gold, in which the *firm's positions* are denominated.
- 7.10.43** **R** For *commodity risk*, the *VaR model* must use a separate risk factor at least for each *commodity* in which the *firm* has material *positions*. The *VaR model* must also capture the risk of less than perfectly correlated movements between similar, but not identical, *commodities* and the exposure to changes in forward prices arising from maturity mismatches. It must also take account of market characteristics, notably delivery dates and the scope provided to traders to close out positions.
- 7.10.44** **R**
- (1) For *CIUs* the actual *foreign currency positions* of the *CIU* must be taken into account.
 - (2) A *firm* may rely on third party reporting of the *foreign currency position* of the *CIU*, where the correctness of this report is adequately ensured.
 - (3) If a *firm* is not aware of the *foreign currency positions* in a *CIU*, this *position* must be carved out and treated in ■ BIPRU 7.5.18R (Derivation of notional *positions* in *CIUs* for the *foreign currency PRR*).
- 7.10.45** **G**
- (1) This paragraph contains *guidance* on the inclusion of *CIUs* in a *VaR model*.
 - (2) The *appropriate regulator* may allow all types of *CIU* to be included within the scope of a *firm's VaR model permission*.
 - (3) ■ BIPRU 7.10 does not distinguish between *specific risk* and *general market risk* for *positions* in *CIUs*. Therefore even if *specific risk* is not otherwise included within the scope of a *firm's VaR model permission*, a *firm* should be able to demonstrate that its *VaR model* captures *specific risk*.
 - (4) A *firm* should also be able to demonstrate that its *VaR model* adequately captures correlations, concentration risk and risks associated with the illiquidity of the *CIU* itself should this be deemed necessary (see ■ BIPRU 7.10.32G).
 - (5) A *firm* may use a look-through approach, under which the *VaR model* estimates are based on the underlying *positions*. If a *firm* uses a look through approach it should also ensure that all the relevant risk factors relating to the underlying *positions* are captured. ■ BIPRU 7.7

(Position risk requirements for collective investment undertakings) sets out *rules* relating to the look through approach when a *firm* is using the *VaR model approach*.

Model standards: Risk factors: Specific risk

- 7.10.46** **R** (1) If a *firm's VaR model* covers the calculation of *PRR* with respect to *specific risk* the *firm* must meet the *VaR specific risk minimum requirements* in addition to the other requirements of **BIPRU 7.10**.
- (2) The *VaR model* must explain the historical price variation in the portfolios concerned.
- (3) The *VaR model* must capture concentration in terms of magnitude and changes of composition of the portfolios concerned.
- (4) The *VaR model* must be robust to an adverse environment.
- (5) The *VaR model* must capture name-related basis risk. That is the *firm* must be able to demonstrate that the *VaR model* is sensitive to material idiosyncratic differences between similar but not identical *positions*.
- (6) The *VaR model* must capture event risk.
- (7) In addition to the other requirements in **BIPRU 7.10**, a *firm* must have an approach in place to capture, in the calculation of its capital requirements, the *incremental risk charge* of its *trading book positions* that is incremental to the default and migration risk captured by the *VaR measures*, as specified in **BIPRU 7.10.55A R** to **BIPRU 7.10.55S G** and **BIPRU 7.10.107R** (Backtesting: Specific risk backtesting).
- (8) [deleted]
- 7.10.47** **G** This paragraph provides *guidance* on **BIPRU 7.10.46 R** (2). Take as an example a *VaR model* based on a factor model or on a historical simulation model. The ability of the model to explain price variation could be demonstrated by a statistical comparison over the same period of time between actual price changes on the portfolio and the profit and loss impact of risk factors included within the model. A *firm* may wish to include an estimate of residual variation not explained by the model.
- 7.10.48** **R** (1) [deleted]
- (2) A *firm's VaR model* must conservatively assess the risk arising from less liquid *positions* and *positions* with limited price transparency under realistic market scenarios. In addition, the *VaR model* must meet minimum data standards. Proxies must be appropriately conservative and may be used only where available data is insufficient or is not reflective of the true volatility of a *position* or portfolio.
- 7.10.49** **R** As techniques and best practices evolve, a *firm* must avail itself of these advances.

7.10.50 **R** [deleted]

7.10.51 **R** [deleted]

7.10.52 **R** [deleted]

Model standards: Materiality

7.10.53 **R** A firm's VaR model must capture accurately all material price risks for positions within the scope of its VaR permission, including risks relating to options or option-like positions. The firm must ensure that, if its VaR model does not accurately capture any material risk, the firm has capital resources adequate to cover that risk. These capital resources must be additional to those required to meet its capital resources requirement.

7.10.54 **G** For example, **R** BIPRU 7.10.53R might involve creating and documenting a prudent incremental PRR charge for the risk not captured in the VaR model and holding sufficient capital resources against this risk. In that case the firm should hold capital resources at least equal to its capital resources requirement as increased by adding this incremental charge to the model PRR. Alternatively the firm may make valuation adjustments through its profit and loss reserves to cover this material risk. These reserves should be transparent to senior management and auditable. The reserves should also be consistent with **R** GENPRU 1.3 (Valuation) while not being excessive in relation to the principles of mark-to-market accounting. Therefore, a firm should be able to satisfy the appropriate regulator that all material risks are adequately addressed, whether this be through the VaR model, through taking an incremental PRR charge or through making an adjustment through profit and loss reserves.

7.10.55 **G** A firm is expected ultimately to move towards full revaluation of option positions. For portfolios containing path dependent options, an instantaneous price shock applied to a static portfolio will be acceptable provided that the risks not captured by such an approach are not material. Where a risk is immaterial and does not justify further capital resources, that immaterial risk should still be documented.

Incremental risk charge: Scope and parameters

7.10.55A **R** A firm must demonstrate that its incremental risk charge meets soundness standards comparable to those under the IRB approach, assuming a constant level of risk and adjusted, where appropriate, to reflect the impact of liquidity, concentrations, hedging and optionality.

7.10.55B **R** The incremental risk charge must cover all positions which are subject to a capital charge for interest-rate specific risk in accordance with the firm's VaR model permission, except securitisation positions and nth-to-default credit derivatives. Where permitted by its VaR model permission, a firm may choose consistently to include all listed equity positions and derivatives positions based on listed equities for which that inclusion is consistent with how the firm internally measures and manages risk, but the approach must reflect the impact of correlations between default and migration events, and it must

not reflect the impact of diversification between default and migration events and other market risk factors.

7.10.55C **R** The *firm's* approach to capture the *incremental risk charge* must measure losses due to default and internal or external ratings migration at the 99.9% confidence interval over a capital horizon of one year.

7.10.55D **R** The *firm's* correlation assumptions must be supported by the analysis of objective data in a conceptually sound framework. The approach to capture the *incremental risk charge* must appropriately reflect *issuer* concentrations. Concentrations that can arise within and across product classes under stressed conditions must also be reflected.

7.10.55E **R** The *firm's* approach must be based on the assumption of a constant level of risk over the one-year capital horizon, implying that given individual *trading book positions* or sets of *positions* that have experienced default or migration over their liquidity horizon are re-balanced at the end of their liquidity horizon to attain the initial level of risk. Alternatively, a *firm* may choose consistently to use a one-year constant *position* assumption.

Incremental risk charge: Liquidity horizons

7.10.55F **R**

- (1) The *firm's* liquidity horizons for calculating *incremental risk charge* must be set according to the time required to sell the *position* or to hedge all material and relevant price risks in a stressed market, having particular regard to the size of the *position*.
- (2) Liquidity horizons must reflect actual practice and experience during periods of both systematic and idiosyncratic stresses. The liquidity horizon must be measured under conservative assumptions and must be sufficiently long that the act of selling or hedging, in itself, would not materially affect the price at which the selling or hedging would be executed.

7.10.55G **R** The determination of the appropriate liquidity horizon for a *position* or set of *positions* is subject to a floor of three months. The determination of the appropriate liquidity horizon for a *position* or set of *positions* must take into account a *firm's* internal policies relating to valuation adjustments and the management of stale *positions*.

7.10.55H **R** When a *firm* determines liquidity horizons for sets of *positions* rather than for individual *positions*, the criteria for defining sets of *positions* must be defined in a way that meaningfully reflects differences in liquidity. The liquidity horizons must be greater for *positions* that are concentrated, reflecting the longer period needed to liquidate those *positions*.

7.10.55I **R** The liquidity horizon for a *securitisation* warehouse must reflect the time to build, sell and securitise the assets, or to hedge the material risk factors, under stressed market conditions.

Incremental risk charge: Hedges

- 7.10.55J **R** (1) Hedges may be incorporated into the calculation of a *firm's incremental risk charge*. *Positions* may be netted only when long and short *positions* refer to the same financial instrument.
- (2) Hedging or diversification effects associated with long and short *positions* involving different instruments or different securities of the same obligor, as well as long and short *positions* in different *issuers*, may only be recognised by explicitly modelling gross long and short *positions* in the different instruments.
- (3) A *firm* must reflect the impact of material risks that could occur during the interval between the hedge's maturity and the liquidity horizon, as well as the potential for significant basis risks in hedging strategies by product, seniority in the capital structure, internal or external rating, maturity, vintage and other differences in the instruments. A *firm* must reflect a hedge only to the extent that it can be maintained even as the obligor approaches a credit or other event.

7.10.55K **R** For *trading book positions* that are hedged via dynamic hedging strategies, a rebalancing of the hedge within the liquidity horizon of the hedged position may be recognised only if the *firm*:

- (1) chooses to model rebalancing of the hedge consistently over the relevant set of *trading book positions*;
- (2) demonstrates that the inclusion of rebalancing results in a better risk measurement;
- (3) demonstrates that the markets for the instruments serving as hedges are liquid enough to allow for this rebalancing even during periods of stress; and
- (4) reflects in the capital charge any residual risks resulting from dynamic hedging strategies.

Incremental risk charge: Nonlinear positions and model risk

- 7.10.55L **R** (1) The *incremental risk charge* must reflect the nonlinear impact of *options*, structured credit derivatives and other *positions* with material nonlinear behaviour with respect to price changes.
- (2) The *firm* must also consider the amount of model risk inherent in the valuation and estimation of price risks associated with those products.

7.10.55M **R** The *incremental risk charge* must be based on objective and up-to-date data.

Incremental risk charge: Validation

7.10.55N **R** A *firm* must validate its approach to *incremental risk charge*. In particular, a *firm* must:

- (1) validate that its modelling approach for correlations and price changes is appropriate for its portfolio, including the choice and weights of its systematic risk factors;
- (2) perform a variety of stress tests (not limited to the range of events experienced historically), including sensitivity analysis and scenario analysis, to assess the qualitative and quantitative reasonableness of the approach, with particular regard to the treatment of concentrations; and
- (3) apply appropriate quantitative validation including relevant internal modelling benchmarks.

7.10.55O **R** A firm's approach for *incremental risk charge* must be consistent with the firm's internal risk management methodologies for identifying, measuring, and managing trading risks.

Incremental risk charge: Documentation and frequency of calculation

7.10.55P **R** A firm must document its approach for the *incremental risk charge* clearly, setting out its correlation and other modelling assumptions.

7.10.55Q **R** A firm must calculate its *incremental risk charge* at least weekly.

Incremental risk charge: Internal approaches based on different parameters

7.10.55R **R** A firm may use an approach for *incremental risk charge* that does not comply with all the requirements in ■ BIPRU 7.10.55A R to ■ BIPRU 7.10.55P R, only if:

- (1) such an approach is consistent with the firm's internal methodologies for identifying, measuring, and managing risks; and
- (2) the firm can demonstrate that its approach results in a capital requirement that is at least as high as it would be if based on an approach in full compliance with the requirements in ■ BIPRU 7.10.55A R to ■ BIPRU 7.10.55P R.

7.10.55S **G** The *appropriate regulator* will review at least annually any approach taken by the firm under ■ BIPRU 7.10.55R R.

All price risk measure: General requirements

7.10.55T **R** As part of its *VaR model permission*, the *appropriate regulator* may authorise a firm to use the *all price risk measure* to calculate an additional capital charge in relation to *positions* in its *correlation trading portfolio* if it meets the following minimum standards:

- (1) it adequately captures all price risks at a 99.9% confidence interval over a capital horizon of one year under the assumption of a

constant level of risk, and adjusted, where appropriate, to reflect the impact of liquidity, concentrations, hedging and optionality;

- (2) it adequately captures the following risks:
- (a) the cumulative risk arising from multiple defaults, including the ordering of defaults, in *tranche* products;
 - (b) credit *spread risk*, including the gamma and cross-gamma effects;
 - (c) volatility of implied correlations, including the cross effect between spreads and correlations;
 - (d) *basis risk*, including both:
 - (i) the basis between the spread of an index and those of its constituent single names; and
 - (ii) the basis between the implied correlation of an index and that of bespoke portfolios;
 - (e) recovery-rate volatility, as it relates to the propensity for recovery rates to affect *tranche* prices; and
 - (f) to the extent that the *all price risk measure* incorporates benefits from dynamic hedging, the risk of hedge slippage and the potential costs of rebalancing those hedges.

7.10.55U R The amount of the capital charge for the *correlation trading portfolio* calculated in accordance with the *all price risk measure* must not be less than 8% of the capital charge that would result from applying ■ BIPRU 7.2.48L R to all *positions* in the *correlation trading portfolio* subject to the *all price risk measure*.

7.10.55V R A *firm* may include in its *all price risk measure positions* that are jointly managed with *positions* in the *correlation trading portfolio* and would otherwise be included in the *incremental risk charge*. In that case, the *firm* must exclude these *positions* from the calculation of its *incremental risk charge*.

7.10.55W R A *firm* must have sufficient market data to ensure that it fully captures the salient risks of the *positions* in its *all price risk measure* in accordance with the standards set out in ■ BIPRU 7.10.55T R.

7.10.55X R A *firm* must demonstrate through backtesting or other appropriate means that its *all price risk measure* can appropriately explain the historical price variation of these *positions*. A *firm* must be able to demonstrate to the *appropriate regulator* that it can identify the *positions* within its *correlation trading portfolio*, in relation to which it is authorised to use the *all price risk measure*, separately from those other *positions* in relation to which it is not authorised to do so.

7.10.55Y R A *firm* must calculate the capital charge under the *all price risk measure* at least weekly.

All price risk measure: Stress testing

- 7.10.55Z **R** (1) For *positions* within its *correlation trading portfolio* in relation to which a *firm* may use the *all price risk measure*, a *firm* must regularly apply a set of specific, predetermined stress scenarios. These stress scenarios must examine the effects of stress to default rates, recovery rates, credit spreads, and correlations on the profit and loss of the *correlation trading portfolio*.
- (2) A *firm* must apply the stress scenarios in (1) at least weekly and report the results to the *appropriate regulator* in accordance with
 ■ BIPRU 7.10.129 R.

- 7.10.55ZA **R** If the results of the stress tests carried out in accordance with
 ■ BIPRU 7.10.55Z R indicate a material shortfall in the amount of capital required under the *all price risk measure*, a *firm* must notify the *appropriate regulator* of this circumstance by no later than two *business days* after the *business day* on which the material shortfall occurred.

- 7.10.55ZB **G** The *appropriate regulator* may use its powers under section 55J (Variation etc. on the Authority's own initiative) of the *Act* to impose on the *firm* a capital add-on to cover the material shortfall reported under
 ■ BIPRU 7.10.55ZA R.

- 7.10.55ZC **G** The *all price risk measure* is based on the *incremental risk charge*. Therefore, when applying the *all price risk measure*, a *firm* should have regard to the requirements in ■ BIPRU 7.10.55A R to ■ BIPRU 7.10.55R R.

Risk management standards: Introduction

- 7.10.56 **G** A *firm* with a complex portfolio is expected to demonstrate greater sophistication in its modelling and risk management than a *firm* with a simple portfolio. For example, a *firm* will be expected to consider, where necessary, varying degrees of liquidity for different risk factors, the complexity of risk modelling across time zones, product categories and risk factors. Some trade-off is permissible between the sophistication and accuracy of the model and the conservatism of underlying assumptions or simplifications.

- 7.10.57 **G** A *firm* should be able to demonstrate that it meets the risk management standards set out in the *VaR model permission* on a legal entity basis. This is particularly important for a *subsidiary undertaking* in a *group* subject to matrix management where the business lines cut across legal entity boundaries.

Risk management standards: General requirement

- 7.10.58 **R** A *firm* must have a conceptually sound risk management system surrounding the use of its *VaR model* that is implemented with integrity and that in particular meet the qualitative standards set out in ■ BIPRU 7.10.59R - ■ BIPRU 7.10.82R.

Risk management standards: Use requirement

- 7.10.59 **R** A firm must base its *model PRR* calculation on the output of the *VaR model* which is used for its internal risk management rather than one developed specifically to calculate its *PRR*.
- 7.10.60 **R** The *VaR model* must be fully integrated into the daily risk management process of the *firm*, and serve as the basis for reporting risk exposures to *senior management* of the *firm*.
- 7.10.61 **G** A firm's *VaR model* output should be an integral part of the process of planning, monitoring and controlling a firm's *market risk* profile. The *VaR model* should be used in conjunction with internal trading and exposure limits. The links between these limits and the *VaR model* should be consistent over time and understood by *senior management*. The *firm* should regard risk control as an essential aspect of the business to which significant resources need to be devoted.

Risk management standards: Risk control unit

- 7.10.62 **R** A firm must have a risk control unit which is independent from business trading units and which reports directly to *senior management*. It:
- (1) must be responsible for designing and implementing the *firm's* risk management system;
 - (2) must produce and analyse daily reports on the output of the *VaR model* and on the appropriate measures to be taken in terms of the trading limits; and
 - (3) conduct the initial and on-going validation of the *VaR model*.

Risk management standards: Senior management

- 7.10.63 **R** A firm's *governing body* and *senior management* must be actively involved in the risk control process, and the daily reports produced by the risk control unit must be reviewed by a level of management with sufficient authority to enforce both reductions of *positions* taken by individual traders as well as in the *firm's* overall risk exposure.
- 7.10.64 **G** It is the responsibility of a firm's own management to ensure the accuracy and integrity of its *VaR model*. This responsibility includes obtaining appropriate independent validation of the *VaR model*.

Risk management standards: Skilled staff

- 7.10.65 **R** A firm must have sufficient numbers of staff skilled in the use of sophisticated models in the trading, risk control, audit and back office areas.

Risk management standards: Controls and compliance

- 7.10.66 **R** A firm must establish, document and maintain policies, controls and procedures to an auditable standard:

- (1) concerning the operation of its *VaR model approach*; and
- (2) for monitoring and ensuring compliance with the policies, controls and procedures in (1).

Risk management standards: Documentation

7.10.67 **R** A *VaR model* must be adequately documented.

- 7.10.68 **G**
- (1) An example of documents required by **R** BIPRU 7.10.67R may be a manual that describes the basic principles of the risk management framework, clearly setting out empirical techniques, principles and assumptions used within it.
 - (2) This documentation should be of sufficient detail for the *appropriate regulator* to be able to develop a clear understanding of how the *VaR model* works from that documentation on its own.

Risk management standards: Track record

7.10.69 **R** A *firm's VaR model* must have a proven track record of acceptable accuracy in measuring risk.

Risk management standards: Development validation

7.10.70 **R** Adequate procedures must be in place to ensure that model changes are validated before being introduced.

7.10.71 **G** The procedures in **R** BIPRU 7.10.70R need not necessarily rely on backtesting using a back-run of recreated data.

Risk management standards: Stress testing

- 7.10.72 **R**
- (1) A *firm* must frequently conduct a rigorous programme of stress testing. The results of these tests must be reviewed by *senior management* and reflected in the policies and limits the *firm* sets.
 - (2) The programme must particularly address:
 - (a) concentration risk;
 - (b) illiquidity of markets in stressed market conditions;
 - (c) one way markets;
 - (d) event and jump to default risks;
 - (e) non linearity of products;
 - (f) deep out of the money *positions*;
 - (g) *positions* subject to the gapping of prices;
 - (h) full revaluation, or a reliable approximation, of *positions*;
 - (i) instant shocks as well as effects of longer term periods of stress;
 - (j) calibration changes under stressed conditions;

- (k) secondary risk factors (such as volatility);
 - (l) basis risk;
 - (m) systemic and localised stresses; and
 - (n) other risks that may not be captured appropriately in the *VaR model* (for example, recovery rate uncertainty, implied correlations and skew risk).
- (3) The shocks applied must reflect the nature of the portfolios and the time it could take to hedge out or manage risks under severe market conditions.

7.10.73 **G** The stress testing under **■ BIPRU 7.10.72R** should be taken into account under the *overall Pillar 2 rule*.

7.10.73A **G** The *firm's* stress testing programme should be comprehensive in terms of both risk and *firm* coverage, and appropriate to the size and complexity of *trading book positions* held.

Risk management standards: Valuation

7.10.74 **R** A *firm* must have procedures to ensure that the valuation of assets and liabilities is appropriate, that valuation uncertainty is identified and appropriate reserving is undertaken where necessary.

Risk management standards: Risk review

7.10.75 **R** At least once a year, a *firm* must conduct, as part of its regular internal audit process, a review of its risk management process. This review must include both the activities of the business trading units and of the independent risk control unit, and must be undertaken by suitably qualified staff independent of the areas being reviewed. This review must consider, at a minimum:

- (1) the adequacy of the documentation of the risk management system and process;
- (2) the organisation of the risk control unit;
- (3) the integration of *market risk* measures into daily risk management;
- (4) the integrity of the management information system;
- (5) the process for approving risk pricing models and valuation systems used in front and back offices;
- (6) the validation of any significant changes in the risk management process;
- (7) the scope of risks and products captured by the *VaR model*;
- (8) the accuracy and completeness of *position data*;

- (9) the process used to ensure the consistency, timeliness, independence and reliability of data sources (including the independence of such data sources);
- (10) the accuracy and appropriateness of volatility and correlation assumptions;
- (11) reserving policies and the accuracy of the valuation procedures and risk sensitivity calculations;
- (12) the process employed to evaluate the *VaR model's* accuracy, including the programme of backtesting;
- (13) the controls surrounding the development of the *VaR model*; and
- (14) the process employed to produce the calculation of the *model PRR*.

Risk management standards: Validation and backtesting

- 7.10.76** **G** The *appropriate regulator* will require a period of initial monitoring or live testing before a *VaR model* can be recognised. This will be agreed on a *firm by firm* basis.
- 7.10.77** **G** In assessing the *firm's VaR model* and risk management, the *appropriate regulator* has regard to the results of internal model validation procedures used by the *firm* to assess the *VaR model*.
- 7.10.78** **R** A *firm* must have processes in place to ensure that its *VaR model* has been adequately validated by suitably qualified parties independent of the development process to ensure that it is conceptually sound and adequately captures all material risks. This validation must be conducted when the *VaR model* is initially developed and when any significant changes are made to the *VaR model*. The validation must also be conducted on a periodic basis but especially where there have been any significant structural changes in the market or changes to the composition of the portfolio which might lead to the *VaR model* no longer being adequate. As techniques and best practices evolve, a *firm* must avail itself of these advances. Model validation must not be limited to backtesting, but must, at a minimum, also include the following:
- (1) tests to demonstrate that any assumptions made within the *VaR model* are appropriate and do not underestimate or overestimate the risk (including testing of the validity of the assumptions and approximations underlying the *VaR model*);
 - (2) in addition to the regulatory backtesting programmes, a *firm* must carry out its own model validation tests in relation to the risks and structures of its portfolios, such as statistical validation techniques and other methods of measuring performance and validity;
 - (3) the use of hypothetical portfolios to ensure that the *VaR model* is able to account for particular structural features that may arise, for example material basis risks and concentration risk; and

- (4) investigation of the limitations of the *VaR model* including testing of the accuracy of parts of the *VaR model* as well as of the whole.
- 7.10.79** **G** (1) In addition to regulatory backtesting programs, testing for model validation should be carried out using additional tests which may include for example:
- (a) testing carried out using hypothetical changes in portfolio value that would occur were end of day positions to remain unchanged;
 - (b) testing carried out for longer periods than required for the regular backtesting programme (for example, 3 years);
 - (c) testing carried out using confidence intervals other than the 99 percent interval required under the quantitative requirements in ■ BIPRU 7.10; and
 - (d) testing of parts of portfolios.
- (2) A longer time period generally improves the power of backtesting. However a longer time period may not be desirable if the *VaR model* or market conditions have changed to the extent that historical data is no longer relevant.

- 7.10.80** **G** Further material on backtesting can be found in ■ BIPRU 7.10.91G - ■ BIPRU 7.10.112G.

Risk management standards: Information technology

- 7.10.81** **G** In assessing whether the *VaR model* is implemented with integrity as described in ■ BIPRU 7.10.58R (Stress testing), the *appropriate regulator* will consider in particular the information technology systems used to run the model and associated calculations. The assessment may include:

- (1) feeder systems; risk aggregation systems; time series databases; the *VaR model* system; stress testing system; the backtesting system including profit and loss cleaning systems where appropriate; data quality; reconciliations and checks on completeness of capture;
- (2) system development, change control and documentation; security and audit trails; system availability and contingency procedures; network adequacy; and
- (3) operational statistics relating to the *VaR model* production process, including, for example, statistics relating to timeliness, number of re-runs required and the reliability of data feeds.

Risk management standards: Controls

- 7.10.82** **R** A *firm* must ensure that it has adequate controls relating to:

- (1) the derivation of the *model PRR*;
- (2) the integrity of the backtesting programme, including the calculation of the profit and loss account;

- (3) the integrity and appropriateness of the *VaR model*, including the *VaR model's* geographic coverage and the completeness of data sources;
- (4) the *VaR model's* initial and ongoing development, including independent validation;
- (5) the valuation models, including independent validation; and
- (6) the adequacy, security and integrity of the information technology infrastructure.

Stress testing

- 7.10.83 **R** ■ BIPRU 7.10.84G-■ BIPRU 7.10.90G relate to stress testing of a *VaR model* (see ■ BIPRU 7.10.72R (Risk management standards: Stress testing)).
- 7.10.84 **G** Stress testing is a way of identifying the risk to a *firm* posed by a breakdown of model assumptions or by low-probability events. Where stress tests reveal unacceptable vulnerability to a given set of circumstances, a *firm* should take prompt steps to manage those risks appropriately, for example by hedging against the outcome or reducing the size of the *firm's exposure*.
- 7.10.85 **R** A *firm* must have the capacity to run daily stress tests.
- 7.10.86 **R** Stress testing must involve identifying market scenarios or other low probability events in all types of risks that generate the greatest losses on a *firm's* portfolio.
- 7.10.87 **R** A *firm* must periodically and actively identify all the worst case scenarios that are relevant to its portfolio. Scenarios used must be appropriate to test the effect of adverse movements in market volatilities and correlations and the effect of any change in the assumptions underlying the *VaR model*. Scenarios involving low probability market events must nevertheless be plausible.
- 7.10.88 **R** Stress testing must capture non-linear effects.
- 7.10.89 **R** A *firm* must have procedures to assess and respond to the results produced from stress testing. In particular, stress testing results must be:
- (1) used to evaluate its capacity to absorb such losses or identify steps to be taken to reduce risk; and
 - (2) communicated routinely to *senior management* and periodically to the *governing body*.
- 7.10.90 **G** A *firm* may want to conduct the more complex stress tests at longer intervals or on an ad hoc basis.

7.10.90A **R** A *firm* must also carry out reverse stress tests.

Backtesting: Introduction

7.10.91 **G** Backtesting is the process of comparing value-at-risk risk measures to portfolio performance. It is intended to act as one of the mechanisms for the ongoing validation of a *firm's VaR model* and to provide incentives for *firms* to improve their *VaR measures*.

7.10.92 **G** It is a condition for granting a *VaR model permission* that a *firm* should have a backtesting programme in place and should provide three months of backtesting history.

7.10.93 **G** Backtesting conducted only at a whole portfolio level using a single measure of profit and loss has limited power to distinguish an accurate *VaR model* from an inaccurate one. Backtesting should therefore be regarded as an additional safeguard rather than a primary validation tool. Such testing does however form the basis of the *appropriate regulator's plus factor* system. The test has been chosen as the basis of the backtesting regime because of its simplicity. A *firm* will therefore be expected to complement this backtesting with more granular backtesting analysis and involving more than one measure of profit and loss (i.e. both a *profit and loss figure* and a *hypothetical profit and loss figure*).

7.10.94 **R** A *firm* must have the capacity to analyse and compare its *profit and loss figures* and *hypothetical profit and loss figures* to the *VaR measure*, both at the level of the whole portfolio covered by the *VaR model permission* and at the level of individual books that contain material amounts of risk.

7.10.94A **R** At a minimum, backtesting of *hypothetical profit and loss figures* must be used for regulatory backtesting and also to calculate *plus factors*.

7.10.95 **G** Backtesting of *hypothetical profit and loss figures* is also used for model validation and for reporting to the *appropriate regulator*.

Backtesting: Basic testing requirements

7.10.96 **R** At a minimum, a *firm* must, on each *business day*, compare each of its 250 most recent *business days' hypothetical profit and loss figures* (ending with the *business day* preceding the *business day* in question) with the corresponding *one-day VaR measures*.

7.10.97 **G** Generally the *positions* underlying the profit and loss account and *VaR measures* should not be materially different.

Backtesting: One day VaR measure

7.10.98 **R** The *one-day VaR measure* for a particular *business day* is the *VaR number* for that *business day* calibrated to a one *business day* holding period and a 99% one-tailed confidence level.

Backtesting: Calculating the profit and loss

- 7.10.99 **G** The ultimate purpose of backtesting is to assess whether capital is sufficient to absorb actual losses. Actual daily profit and loss means the day's profit and loss arising from trading activities within the scope of the *VaR model permission*. This measure should, however, be 'cleaned' using ■ BIPRU 7.10.100R inclusion in profit and loss of non-modelled factors.
- 7.10.100 **R** The *profit and loss figure* for a particular *business day* is the *firm's* actual profit or loss for that day in respect of the trading activities within the scope of the *firm's VaR model permission*, adjusted by stripping out:
- (1) fees and commissions;
 - (2) brokerage;
 - (3) additions to and releases from reserves which are not directly related to *market risk* (e.g. administration reserves); and
 - (4) any inception profit exceeding an amount specified for this purpose in the *firm's VaR model permission* (where inception profit is defined as any profit arising immediately on entering into a new transaction).
- 7.10.101 **G** The definition of *profit and loss figure* may be amended or replaced in an individual *VaR model permission* if the *firm* can demonstrate to the *appropriate regulator* that the alternative method meets the spirit and purpose of the provisions in ■ BIPRU 7.10 about the *profit and loss figure*.
- 7.10.102 **G** The *appropriate regulator* will review as part of a *firm's VaR model permission* application the processes and documentation relating to the derivation of profit and loss used for backtesting. A *firm's* documentation should clearly set out the basis for cleaning profit and loss. To the extent that certain profit and loss elements are not updated every day (for example certain reserve calculations) the documentation should clearly set out how such elements are included in the profit and loss series.

Backtesting: Definition of backtesting exception

- 7.10.103 **R** A *backtesting exception* is deemed to have occurred for any *business day* if the *hypothetical profit and loss figure* for that *business day* shows a loss, which in absolute magnitude, exceeds the *one-day VaR measure* for that *business day*. The only exception is if that *business day* is identified in the *firm's VaR model permission* as giving rise to an excluded *backtesting exception*.

Backtesting: Obligation to notify the appropriate regulator

- 7.10.104 **R** If a *backtesting exception* occurs, the *firm* must notify its usual supervisory contact at the *appropriate regulator* orally by close of business two *business days* after the *business day* for which the *backtesting exception* occurred. Within five *business days* following the end of each *Month*, the *firm* must submit to the *appropriate regulator* a written account of the previous *Month's backtesting exceptions* (if any). This explanation must include the causes of the *backtesting exceptions*, an analysis of whether the *backtesting*

exception indicate a deficiency in the *firm's VaR model* and the *firm's* planned response (if any).

Backtesting: Summary of the backtesting cycle

- 7.10.105 **G**
- (1) This paragraph gives *guidance* on the backtesting calculation and reporting process in ■ BIPRU 7.10.96R - ■ BIPRU 7.10.104R.
 - (2) Let the day on which the loss referred to in ■ BIPRU 7.10.100R is made be day *n*. The value-at-risk measure for that day will be calculated on day *n-1*, or overnight between day *n-1* and day *n*. Profit and loss figures are produced on day *n+1*, and backtesting also takes place on day *n+1*. The *firm's* supervisor should be notified of any *backtesting exceptions* by close of business on day *n+2*.
 - (3) Any *backtesting exception* initially counts for the purpose of the calculation of the *plus factor* even if subsequently the *appropriate regulator* agrees to exclude it under the process described in ■ BIPRU 7.10.106G. Thus, where the *firm* experiences a *backtesting exception* and already has four or more *backtesting exceptions* for the previous 250 *business days*, changes to the *multiplication factor* arising from changes to the *plus factor* become effective at *n+3* (using the time-line terminology in (2)).

Backtesting: Process for disregarding backtesting exceptions

- 7.10.106 **G**
- (1) This paragraph gives *guidance* on the process for excluding *backtesting exceptions* as referred to in ■ BIPRU 7.10.103R.
 - (2) The *appropriate regulator* will respond flexibly to *backtesting exceptions*. However, the *appropriate regulator's* starting assumption will be that a *backtesting exception* should be taken into account for the purpose of the calculation of *plus factors*. If the *firm* believes that a *backtesting exception* should not count for that purpose, then it should seek a variation of its *VaR model permission* in order to exclude that particular *backtesting exception*. The *appropriate regulator* will then decide whether to agree to such a variation.
 - (3) One example of when a *firm's backtesting exception* might properly be disregarded is when it has arisen as a result of a risk that is not captured in its *VaR model* but against which *capital resources* are already held.

Backtesting: Specific risk backtesting

- 7.10.107 **R**
- If a *firm's VaR model permission* covers *specific risk*, the *firm* must validate its *VaR model* through backtesting aimed at assessing whether *specific risk* is being accurately captured. This backtesting must be carried out in accordance with the provisions of its *VaR model permission*. If the *VaR model permission* provides for this backtesting to be performed on the basis of relevant sub-portfolios, these must be chosen in a consistent manner.

- 7.10.108 **G**
- Specific risk* backtesting involves the backtesting of a standalone *specific risk VaR* measure against a profit and loss series determined by reference to exposure risk factors categorised as *specific risk*. Alternatively *specific risk*

backtesting may take the form of regular backtesting of trading books and portfolios that are predominantly exposed to risk factors categorised as *specific risk*. The precise requirements for *specific risk* backtesting will be specified in the *firm's VaR model permission* as will the definition of a *specific risk backtesting exception*.

Backtesting: Multiple exceptions

7.10.109 **R** If ten or more *backtesting exceptions* or ten or more *specific risk backtesting exceptions* are recorded in a 250 *business day* period, a *firm* must take immediate corrective action.

7.10.110 **G** Where backtesting reveals severe problems with the basic integrity of the *VaR model*, the *appropriate regulator* may withdraw model recognition. In particular, if ten or more *backtesting exceptions* are recorded in a 250 *business day* period, the *appropriate regulator* may apply a *plus factor* greater than one or the *appropriate regulator* may consider revoking a *firm's VaR model permission*. The *appropriate regulator* may also consider revoking a *firm's VaR model permission* if ten or more *specific risk backtesting exceptions* occur in such a period.

Backtesting: Hypothetical profit and loss

7.10.111 **R** A *firm* must perform backtesting against a *hypothetical profit and loss figure* with respect to each *business day*. A *hypothetical profit and loss figure* for a *business day* means the *hypothetical profit and loss figure* that would have occurred for that *business day* if the portfolio on which the *VaR number* for that *business day* is based remained unchanged.

7.10.112 **G**

- (1) A *hypothetical profit and loss figure* is based on the day's change in the value of the same portfolio that was used to generate the value-at-risk forecast.
- (2) [deleted]
- (3) The *firm* may also need to calculate a *hypothetical profit and loss figure* in order to produce profit attribution reports and to analyse the cause of *backtesting exceptions*.

7.10.112A **G** The definition of *hypothetical profit and loss figure* may be amended or replaced in an individual *VaR model permission* if the *firm* can demonstrate to the *appropriate regulator* that the alternative method meets the spirit and purpose of the provisions in ■ BIPRU 7.10 about the *hypothetical profit and loss figure*.

Capital calculations: General

7.10.113 **R** The *model PRR* is, for any *business day* (the "relevant" *business day*), calculated in accordance with the following formula:

- (1) the higher of:
 - (a) the *VaR number* for the relevant *business day*; and

- (b) the average of its daily *VaR numbers* for each of the 60 *business days* ending with the relevant *business day*, multiplied by the *multiplication factor* for the relevant *business day*; and
- (2) (in the case of a *VaR model permission* that covers *specific risk*) the higher of:
- (a) the *incremental risk charge* for the relevant *business day*; and
- (b) the average of the twelve-week *incremental risk charge*; and
- (3) the higher of:
- (a) the latest *stressed VaR number*; and
- (b) the average of the *firm's* daily *stressed VaR number* for the 60 *business days* ending with the relevant *business day*, multiplied by the *multiplication factor* applied to the *stressed VaR measure* for the relevant *business day*; and
- (4) (in the case of a *VaR model permission* that covers *all price risk measure*) the higher of:
- (a) the *all price risk measure* for the relevant *business day*; and
- (b) the average of the twelve-week *all price risk measure*.

7.10.114 **R** For any day that is not a *business day*, the *model PRR* is the amount for the prior *business day*.

7.10.115 **R** The *VaR number* for any *business day* means the *VaR measure*, in respect of the previous *business day's* close-of-business *positions* in products coming within the scope of the *VaR model permission*, calculated by the *VaR model* and in accordance with **■ BIPRU 7.10** and any methodology set out in the *VaR model permission*. The *VaR number* must not be calculated taking into account matters on the *business day* for which it is the *VaR number*.

7.10.116 **R** The *incremental risk charge* for any *business day* means the *incremental risk charge* required under the provisions in **■ BIPRU 7.10** about *specific risk*, in respect of the previous *business day's* close-of-business *positions* with respect to which those provisions apply.

7.10.116A **R** The *all price risk measure* for any *business day* means the *all price risk measure* required under the provisions in **■ BIPRU 7.10** about *specific risk* for the *correlation trading portfolio*.

7.10.117 **G** The following equation expresses **■ BIPRU 7.10.113R** mathematically:

$$PRR_{VaR} = \text{Max} \left\{ VaR_t, fx \frac{1}{60} \sum_{i=0}^{59} VaR_{t-i} \right\} + \text{Max} \left\{ SVaR_t, sx \frac{1}{y} \sum_{i=0}^{y-1} SVaR_{t-i} \right\} + \text{Max} \left\{ IRC_t, \frac{1}{z} \sum_{i=0}^{z-1} IRC_{t-i} \right\} + \text{Max} \left\{ APR_t, \frac{1}{w} \sum_{i=0}^{w-1} APR_{t-i} \right\}$$

where:

- (1) PRR_{VaR} is a *firm's model PRR*;
- (2) VaR_t represents the previous day's value-at-risk figure;

- (3) VaR_{t-i} represents the value-at-risk calculated for i business days earlier;
- (4) f is the *multiplication factor* for VaR ;
- (5) $SVAR_t$ represents the latest *stressed VaR* figure;
- (6) $SVAR_{t-i}$ represents the *stressed VaR* calculated for i business days earlier;
- (7) s is the *multiplication factor* for *stressed VaR*;
- (8) y is the number of times the *stressed VaR* was calculated in the last 60 business days;
- (9) IRC_t represents the latest *incremental risk charge*;
- (10) IRC_{t-i} represents the *incremental risk charge* calculated for i business days earlier;
- (11) z is the number of times the *incremental risk charge* was calculated in the last 12 weeks;
- (12) APR_t represents the latest *all price risk measure*;
- (13) APR_{t-i} represents the *all price risk measure* calculated for i business days earlier; and
- (14) w is the number of times the *all price risk measure* was calculated in the last 12 weeks.

Capital calculations: Multiplication factors

- 7.10.118 **R** The *multiplication factor*, for VaR and *stressed VaR*, for any business day is the sum of the *minimum multiplication factor* and the *plus factor* for that day.
- 7.10.119 **R** The *minimum multiplication factor*, for VaR and *stressed VaR*, is three or any higher amount the *VaR model permission* defines it as.
- 7.10.120 **G** The *minimum multiplication factor*, for VaR and *stressed VaR*, will never be less than three. If the *appropriate regulator* does set the *minimum multiplication factor*, for VaR and *stressed VaR*, above three the *VaR model permission* will have a table that sets out the reasons for that add on and specify how much of the add on is attributable to each reason (see **BIPRU 7.10.121R**). If there are weaknesses in the *VaR model* that may otherwise be considered a breach of the minimum standards referred to in **BIPRU 7.10.24R** the *appropriate regulator* may apply such an add on to act as a mitigant for those weaknesses.
- 7.10.121 **R** Something that would otherwise be a breach of the minimum standards in **BIPRU 7.10.26R** - **BIPRU 7.10.53R** is not a breach to the extent that that thing is identified in the *firm's VaR permission* as a reason for an increase in the *minimum multiplication factor*, for VaR and *stressed VaR*, above 3.

7.10.122 **G** Typically, any add on will be due to a specific weakness in systems and controls identified during the *appropriate regulator's* review that the *appropriate regulator* does not consider material enough to justify withholding overall model recognition. The *firm* will be expected to take action to address the reasons for any add on. The *appropriate regulator* will then review these periodically and, where satisfactory action has been taken, the add on will be removed through a variation of the *VaR model permission*.

7.10.123 **G** The *plus factor* system is designed so that the more often a *VaR model* has under-predicted losses in the past, the higher should be the capital requirement based on the *VaR model*. It is intended to provide a capital incentive for the *firm* to continue to improve the accuracy of its *VaR model*.

7.10.124 **R** The table in **■ BIPRU 7.10.125R** sets out the *plus factors* to be added to the *minimum multiplication factor*, for *VaR* and *stressed VaR*, for any *business day*. It is based on the number of *backtesting exceptions* that occurred during the backtesting period as referred to in **■ BIPRU 7.10.96R** (Backtesting: Basic testing requirements) ending three *business days* preceding the *business day* for which the *model PRR* is being calculated.

7.10.125 **R** Table: Backtesting plus factors

This table belongs to **■ BIPRU 7.10.124R**

Zone	Number of recorded exceptions	Plus factor
Green	4 or less	0.00
Yellow	5	0.40
	6	0.50
	7	0.65
	8	0.75
Red	9	0.85
	10 or more	1.00

7.10.126 **G** A *VaR model* that correctly predicts a one-tailed 99% confidence level is expected to produce, on average, 2.5 *backtesting exceptions* every 250 days. Random events may cause the number of *backtesting exceptions* actually observed to vary. The *plus factor* system is designed to take this into account. Hence *plus factors* are only imposed on the *firm* if it has five or more recorded *backtesting exceptions*. Therefore, where a *backtesting exception* appears to be caused simply by chance, it will not be appropriate for a *VaR model permission* to be varied to exclude that *backtesting exception* as described in **■ BIPRU 7.10.106G** (Backtesting: Process for disregarding backtesting exceptions).

Capital calculations: Specific risk surcharge: transitional requirements

7.10.127 **G** *Firms* who gained model recognition before 1 January 2007 will be permitted to calculate *PRR* for *specific risk* in accordance with the methodology they were permitted to use immediately before that date

instead of capturing event and default risk in their models (see ■ BIPRU TP 14 (Market risk: VaR models)). This treatment will not be available to a *firm* that gains model recognition after that date.

Reporting procedures and requirements

7.10.128 **G** A *VaR model permission* will contain requirements for what the *firm* should report to the *appropriate regulator* and the procedures for reporting. The precise requirements will vary from *VaR model permission* to *VaR model permission*. ■ BIPRU 7.10.129R-■ BIPRU 7.10.130R set out what the *appropriate regulator* regards as the standard requirements.

7.10.129 **R** A *firm* must, no later than the number of *business days* after the end of each quarter specified in the *VaR model permission* for this purpose, submit, in respect of that quarter, a report to the *appropriate regulator* about the operation of the *VaR model*, the systems and controls relating to it and any changes to the *VaR model* and those systems and controls. Each report must outline as a minimum the following information in respect of that quarter:

- (1) methodological changes and developments to the *VaR model*;
- (2) the introduction of all new pricing models used in connection with the *VaR model* and any changes to any pricing models used in connection with the *VaR model*, including details of any material associated valuation or risk management issues;
- (3) a summary of backtesting performance against *profit and loss figures* (if calculated) and *hypothetical profit and loss figures*, which must be provided in electronic format as stipulated by the *VaR model permission*;
- (4) (if the *VaR model permission* covers *specific risk*) the results of the *specific risk* backtesting including *specific risk* backtesting exceptions;
- (5) any change to any feeder or pre-processing systems in connection with the *VaR model*, including changes to any of the systems set out in the list described in ■ BIPRU 7.10.131G (1) (as it exists at the date of the *VaR model permission*), and any introduction of a new such system;
- (6) any changes to the products coming within the scope of the *VaR model*;
- (7) any material changes or additions to any of the matters referred to in the *firm's* internal documentation in relation to the *VaR model* (as it exists at the date of the *VaR model permission*) or to any matters subsequently notified under (7);
- (8) any changes in *senior management*;
- (9) an up-to-date list of products covered by the *VaR model permission* showing all changes made since the *VaR model permission* was granted;
- (10) where applicable (nil returns are not required), details of:

- (a) any use of a changed historical observation period in accordance with ■ BIPRU 7.10.30R or any change in the use of any weighting scheme as described in ■ BIPRU 7.10.33R;
 - (b) any data series becoming unreliable as described in ■ BIPRU 7.10.31R and any subsequent use of alternative value-at-risk measurement techniques;
 - (c) the frequency of updating data sets being increased in accordance with ■ BIPRU 7.10.34R;
 - (d) any change in the method employed to derive 10-day VaR measure (see ■ BIPRU 7.10.28R);
 - (e) to the extent that the use of correlations is permitted by a *firm's VaR model permission*, a summary of any notifications that are required under ■ BIPRU 7.10.37R; and
 - (f) the *VaR model* not accurately capturing risks (as referred to in ■ BIPRU 7.10.53R) and any steps taken under ■ BIPRU 7.10.53R; and
- (11) the results of the stress tests on the *firm's correlation trading portfolio* under ■ BIPRU 7.10.55Z R, including a comparison to the current capital charge.

7.10.130 **R** A *firm* must provide to, and discuss with, the *appropriate regulator* details of any significant planned changes to the *VaR model* before those changes are implemented. These details must include information about the nature of the change and an estimate of the impact on *VaR numbers* and the *incremental risk charge*.

Updating the VaR model permission

7.10.131 **G** The *VaR model permission* will generally contain a list of the following:

- (1) feeder systems and pre-processing systems;
- (2) products covered by the *VaR model permission*; and
- (3) the *firm's* internal documentation in relation to the *VaR model*.

7.10.132 **G** The information in ■ BIPRU 7.10.131G will vary over time. It is therefore not included in a *VaR model permission* as a *rule* but for information only. The *appropriate regulator* will update that information regularly in accordance with information supplied under ■ BIPRU 7.10.129R. That updating will not amount to a variation of the *VaR model permission*.

Link to standard PRR rules: Incorporation of the model output into the capital calculation

7.10.133 **G** A *VaR model permission* will modify ■ GENPRU 2.1.52 R (Calculation of the *market risk capital requirement*) to provide that a *firm* should calculate its *market risk capital requirement* in accordance with ■ BIPRU 7.10 to the extent set out in the *VaR model permission*.

- 7
- 7.10.134** **G** By modifying **■ GENPRU 2.1.52 R** (Calculation of the *market risk* capital requirement) to allow the *firm* to use the *VaR model* to calculate all or part of its *PRR* for certain positions, the *appropriate regulator* is treating it like an application rule. The modification means that the *PRR* calculation set out in **■ BIPRU 7.10** supersedes the *standard market risk PRR rules* for products and risks coming within the scope of the *VaR model permission*.
- 7.10.135** **R** To the extent that a *position* does not fall within the scope of a *firm's VaR model permission* the *firm* must calculate the *PRR* under the *standard market risk PRR rules* or, as applicable, those provisions as modified by the *firm's CAD 1 waiver*.
- 7.10.136** **R**
- (1) This rule applies to a *position* of a type that comes within the scope of a *firm's VaR model permission*.
 - (2) Subject to **■ BIPRU 7.10.136A R**, if, where the *standard market risk PRR rules* apply, a *position* is subject to a *PRR charge* and the *firm's VaR model permission* says that it covers the risks to which that *PRR charge* relates, the *firm* must, for those risks, calculate the *PRR* for that *position* under the *VaR model approach* rather than under the *standard market risk PRR rules*.
 - (3) If, where the *standard market risk PRR rules* apply, a *position* is subject to one or more *PRR charges* and the *firm's VaR model permission* does not cover all the risks to which those *PRR charges* relate, the *firm* must calculate the *PRR* for that *position* under the *VaR model approach* (for those risks that are covered) and under the *standard market risk PRR rules* (for those other risks).
 - (4) Where the *standard market risk PRR rules* distinguish between *specific risk* and *general market risk* a *firm's VaR model permission* covers *specific risk* to the extent that it says it does. If the *firm's VaR model permission* does not cover *specific risk*, **■ BIPRU 7.10.143R** and **■ BIPRU 7.10.144R** apply.
 - (5) If a *firm's VaR model permission* covers *positions* in *CIUs* it covers *specific risk* with respect to those *positions*.
- 7.10.136A** **R** A *firm* must calculate the *market risk capital requirement* for *securitisation positions* and *positions* in the *correlation trading portfolio* in accordance with the *standard market risk PRR rules*, with the exception of those *positions* subject to the *all price risk measure*.
- 7.10.137** **R** A *firm* may exclude from the *VaR model approach* immaterial risks within the scope of its *VaR model approach*. If a *firm* does so it must instead apply the *standard market risk PRR rules* to those risks.
- 7.10.138** **R**
- (1) If a *firm* calculates its *market risk capital requirement* using a combination of the *standard market risk PRR rules* and either the *VaR model approach* or the *VaR model approach* with the *CAD 1 model approach* the *PRR* from each method must be added together.

- (2) A *firm* must take appropriate steps to ensure that all of the approaches are applied in a consistent manner.

7.10.139 **G** An example of the effect of **■ BIPRU 7.10.138R** is that where a *firm* normally calculates the *PRR* for a particular portfolio using a *VaR model*, a *firm* should not switch to the *standard market risk PRR rules* purely to achieve a more attractive *PRR*.

7.10.140 **R** If:

- (1) the *standard market risk PRR rules* provide for a choice of which of the *PRR charges* to use or specify that one type must be used in some circumstances and that another type must be used in other circumstances;
- (2) one of those types is disapplied under **■ BIPRU 7.10.136R**; and
- (3) the other type is not disapplied;

the *firm*:

- (4) must use the *VaR model approach* if under the *standard market risk PRR rules* the *firm* must use the *standard market risk PRR rules* in (2); and
- (5) may use the *VaR model approach* if under the *standard market risk PRR rules* the *firm* may use the *standard market risk PRR rules* in (2).

7.10.141 **G** The treatment of a *convertible* is an example of a situation in which **■ BIPRU 7.10.140R** applies. The table in **■ BIPRU 7.3.3R** (Table: Instruments which result in notional positions) shows that there are circumstances in which under the *standard market risk PRR rules* a *firm* should calculate an *equity PRR* and that there are circumstances in which a *firm* may choose between calculating an *equity PRR* and an *interest rate PRR*. **■ BIPRU 7.10.140R** would be relevant if a *firm's VaR model permission* only covers one of *equity risk* and *interest rate risk*.

7.10.142 **R** The *standard market risk PRR rules* for the *option PRR* are only disapplied to the extent that the derived positions arising under **■ BIPRU 7.6.13R** (Table: Derived positions) come within the scope of the *VaR model permission*.

Link to standard PRR rules: General market risk only

7.10.143 **R** If a *firm's VaR model permission* covers *interest rate general market risk* but not *interest rate specific risk*, the *firm* must calculate the *interest rate PRR* so far as it relates to *interest rate specific risk* in accordance with the *standard market risk PRR rules* except that the *firm* must not use the *basic interest rate PRR* calculation in **■ BIPRU 7.3.45R** (Basic interest rate calculation for equity instruments).

Link to standard PRR rules: General market risk only

- 7.10.144 **R** If a *firm's VaR model permission* covers *equity general market risk* but not *equity specific risk*, the *firm* must calculate the *equity PRR* so far as it relates to *equity specific risk* in accordance with the *standard market risk PRR rules* except that the *PRR for equity specific risk* must be calculated under the *standard equity method*.

Link to standard PRR rules: Miscellaneous

- 7.10.145 **R**
- (1) To the extent that a *firm's VaR model permission* does not allow it to use an approach set out in ■ BIPRU 7.10 the relevant provisions in ■ BIPRU 7.10 do not apply to that *firm*.
 - (2) If a provision of the *Handbook* refers to ■ BIPRU 7.10, that reference must, in the case of a particular *firm* with a *VaR model permission*, be treated as excluding provisions of ■ BIPRU 7.10 that do not apply under the *VaR model permission* and as taking into account any modifications to ■ BIPRU 7.10 made by the *VaR model permission*. Such references also include requirements and conditions contained in the *VaR model permission* but not ■ BIPRU 7.10 and to the *rules* modified by the *VaR model permission*.

Requirement to use value at risk methodology

- 7.10.146 **R** A *VaR model* must be a value-at-risk model. It must provide an estimate of the worst expected loss on a portfolio resulting from market movements over a period of time with the specified confidence level.

Ceasing to meet the requirements of BIPRU 7.10

- 7.10.147 **G** If a *firm* ceases to meet any of the requirements set out in ■ BIPRU 7.10, the *appropriate regulator's* policy is that the *VaR model permission* should cease to have effect. In part this will be achieved by making it a condition of a *firm's VaR model permission* that it complies at all times with the minimum standards referred to in ■ BIPRU 7.10.26R - ■ BIPRU 7.10.53R. Even if they are not formally included as conditions, the *appropriate regulator* is likely to consider revoking the *VaR model permission* if the requirements are not met.

- 7.10.148 **R** If a *firm* ceases to meet the conditions or requirements in its *VaR model permission* or ■ BIPRU 7.10 it must notify the *appropriate regulator* at once.

Changes to a VaR model

- 7.10.149 **R** A *firm* may change its *VaR model* to such extent as it sees fit, except that it must not make a change that (either on its own or together with other changes since the date of *VaR model permission*) would:
- (1) be inconsistent with *VaR model permission* or ■ BIPRU 7.10; or
 - (2) mean that backtesting in accordance with ■ BIPRU 7.10 and the *VaR model permission* would result in the use of data that is inappropriate for the purposes of measuring the performance of the *VaR model*.



7.11 Credit derivatives in the trading book

Scope

7.11.1 **R** This section applies to the treatment of credit derivatives in the *trading book*.

Establishment of positions created by credit derivatives: Treatment of the protection seller

7.11.2 **R** ■ BIPRU 7.11.3R - ■ BIPRU 7.11.11R relate to the treatment of the *protection seller* for the purpose of calculating the *securities PRR*. Positions are determined in accordance with ■ BIPRU 7.11.4R - ■ BIPRU 7.11.11R.

7.11.3 **R** (1) When calculating the *PRR* of the *protection seller*, unless specified differently by other *rules* and subject to (2), the notional amount of the credit derivative contract must be used. For the purpose of calculating the *specific risk PRR charge*, other than for total return swaps, the maturity of the credit derivative contract is applicable instead of the maturity of the obligation.

(2) When calculating the *PRR* of the *protection seller*, a *firm* may choose to replace the notional value of the credit derivative by the notional value adjusted for changes in the *market value* of the credit derivative since trade inception.

7.11.4 **R** A total return swap creates a long *position* in the *general market risk* of the reference obligation and a short *position* in the *general market risk* of a *zero-specific-risk security* with a maturity equivalent to the period until the next interest fixing and which is assigned a 0% *risk weight* under the *standardised approach* to credit risk. It also creates a long *position* in the *specific risk* of the reference obligation.

7.11.5 **R** A credit default swap does not create a *position* for *general market risk*. For the purposes of *specific risk*, a *firm* must record a synthetic long *position* in an obligation of the reference entity, unless the derivative is rated externally and meets the conditions for a *qualifying debt security*, in which case a long *position* in the derivative is recorded. If premium or interest payments are due under the product, these cash flows must be represented as notional *positions* in *zero-specific-risk securities*.

- 7.11.6** **R** A single name credit linked note creates a long *position* in the *general market risk* of the note itself, as an interest rate product. For the purpose of *specific risk*, a synthetic long *position* is created in an obligation of the reference entity. An additional long *position* is created in the issuer of the note. Where the credit linked note has an external rating and meets the conditions for a *qualifying debt security*, a single long *position* with the *specific risk* of the note need only be recorded.
- 7.11.7** **R** In addition to a long *position* in the *specific risk* of the issuer of the note, a multiple name credit linked note providing proportional protection creates a *position* in each reference entity, with the total notional amount of the contract assigned across the *positions* according to the proportion of the total notional amount that each exposure to a reference entity represents. Where more than one obligation of a reference entity can be selected, the obligation with the highest *risk weighting* determines the *specific risk*.
- 7.11.8** **R** Where a multiple name credit linked note has an external rating and meets the conditions for a *qualifying debt security*, a single long *position* with the *specific risk* of the note need only be recorded.
- 7.11.9** **R** A first-asset-to-default credit derivative creates a *position* for the notional amount in an obligation of each reference entity. If the size of the maximum credit event payment is lower than the *PRR* requirement under the method in the first sentence of this *rule*, the maximum payment amount may be taken as the *PRR* requirement for *specific risk*.
- 7.11.10** **R** A second-asset-to-default credit derivative creates a *position* for the notional amount in an obligation of each reference entity less one (that with the lowest *specific risk PRR* requirement). If the size of the maximum credit event payment is lower than the *PRR* requirement under the method in the first sentence of this *rule*, this amount may be taken as the *PRR* requirement for *specific risk*.
- 7.11.11** **R** If an *n*-th-to-default derivative is externally rated and meets the conditions for a *qualifying debt security*, then the *protection seller* need only calculate one *specific risk* charge reflecting the rating of the derivative. The *specific risk* charge must be based on the *securitisation PRAs* in ■ BIPRU 7.2 as applicable.

**Establishment of positions created by credit derivatives:
Treatment of the protection buyer**

- 7.11.12** **R** For the *protection buyer*, the *positions* are determined as the mirror principle of the *protection seller*, with the exception of a credit linked note (which entails no short *position* in the issuer). If at a given moment there is a call option in combination with a *step-up*, such moment is treated as the maturity of the protection. In the case of first-to-default credit derivatives and *n*th to default credit derivatives, the treatment in ■ BIPRU 7.11.12AR and ■ BIPRU 7.11.12B R applies instead of the mirror principle.

[Note: CAD Annex I point 8.B]

7.11.12A **R** Where a *firm* obtains credit protection for a number of reference entities underlying a credit derivative under the terms that the first default among the assets will trigger payment and that this credit event will terminate the contract, the *firm* may off-set specific risk for the reference entity to which the lowest specific risk percentage charge among the underlying reference entities applies according to the Table in ■ BIPRU 7.2.44R.

[Note: CAD Annex I point 8.B]

7.11.12B **R** Where the n^{th} default among the exposures triggers payment under the credit protection, the *protection buyer* may only off-set specific risk if protection has also been obtained for defaults 1 to $n-1$ or when $n-1$ defaults have already occurred. In those cases, the methodology set out in ■ BIPRU 7.11.12AR for first-to-default credit derivatives must be followed, appropriately modified for n^{th} -to-default products.

[Note: CAD Annex I point 8.B]

Deriving the net position in each debt security: Credit derivatives

7.11.12C **R** A *firm* must calculate both the net long and the net short positions in credit derivatives by applying ■ BIPRU 7.2.36 R and ■ BIPRU 7.2.37 R and, where applicable, ■ BIPRU 7.2.42A R to ■ BIPRU 7.2.42C R or ■ BIPRU 7.11.13 R to ■ BIPRU 7.11.17 R.

Recognition of hedging provided by credit derivatives

7.11.13 **R** (1) ■ BIPRU 7.11.14R - ■ BIPRU 7.11.17R relate to *specific risk PRR* for trading book positions hedged by credit derivatives for the purposes of the calculation of the *securities PRR*.

(2) A *firm* may take an allowance for protection provided by credit derivatives for the purposes in (1) in accordance with the principles set out in the *rules* referred to in (1).

(3) [deleted]

7.11.14 **R** (1) A *firm* may take full allowance when the value of two legs always move in the opposite direction and broadly to the same extent.

(2) This will be the case in the following situations:

- the two legs consist of completely identical instruments; or
- a long cash *position* is hedged by a total rate of return swap (or vice versa) and there is an exact match between the reference obligation and the underlying exposure (i.e., the cash *position*).

(3) The maturity of the swap itself may be different from that of the underlying exposure for the purposes of (2)(b).

(4) In these situations, a *firm* must not apply a *specific risk PRR* to either side of the *position*.

7.11.15 **R** An 80% offset may be applied when the value of two legs always move in the opposite direction and where there is an exact match in terms of the reference obligation, the maturity of both the reference obligation and the credit derivative, and the currency of the underlying exposure. In addition, key features of the credit derivative contract must not cause the price movement of the credit derivative materially to deviate from the price movements of the cash *position*. To the extent that the transaction transfers risk, an 80% *specific risk* offset may be applied to the side of the transaction with the higher *PRR*, while the *specific risk* requirements on the other side are zero.

7.11.16 **R**

- (1) A *firm* may take partial allowance when the value of two legs usually move in the opposite direction. This would be the case in the situations set out in (2) - (4).
- (2) The first situation referred to in (1) is that the *position* falls under **■ BIPRU 7.11.16 R(2)(b)** but there is an asset mismatch between the reference obligation and the underlying exposure. However, the *positions* meet the following requirements:
 - (a) the reference obligation ranks *pari passu* with or is junior to the underlying obligation; and
 - (b) the underlying obligation and reference obligation share the same obligor and have legally enforceable cross-default or cross-acceleration clauses.
- (3) The second situation referred to in (1) is that the *position* falls under **■ BIPRU 7.11.14 R(2)(a)** or **■ BIPRU 7.11.15 R** but there is a currency or maturity mismatch between the credit protection and the underlying asset (currency mismatches must be included in the normal reporting with respect to the *foreign currency PRR*).
- (4) The third situation referred to in (1) is that the *position* falls under **■ BIPRU 7.11.15 R** but there is an asset mismatch between the cash *position* and the credit derivative. However, the underlying asset is included in the (deliverable) obligations in the credit derivative documentation.
- (5) In each of those situations, rather than adding the *specific risk PRR* requirements for each side of the transaction, only the higher of the two *PRR* requirements applies.

7.11.17 **R** In all situations not falling under **■ BIPRU 7.11.14 R** - **■ BIPRU 7.11.16 R**, a *firm* must assess a *specific risk PRR charge* against both sides of the *positions*.

Specific risk calculation

7.11.18 **R** [deleted]

7.11.19 **R** [deleted]

7.11.20 **R** The *specific risk* portion of the *interest rate PRR* for credit derivatives in the trading book must be calculated in accordance with **■ BIPRU 7.2.43 R** to

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■ BIPRU 7.2.46A G (Specific risk calculation), ■ BIPRU 7.2.48A R to ■ BIPRU 7.2.48K R (Specific risk: securitisations and re-securitisations), ■ BIPRU 7.2.48L R (Specific risk: Correlation trading portfolio), ■ BIPRU 7.2.49 R to ■ BIPRU 7.2.51 G (Definition of a qualifying debt security) and the other provisions of ■ BIPRU 7.11, as applicable.

7.11.21 **R** [deleted]

7.11.22 **R** [deleted]

7.11.23 **R** [deleted]

7.11.24 **R** [deleted]

7.11.25 **R** [deleted]

7.11.26 **R** [deleted]

7.11.27 **R** [deleted]

7.11.28 **R** [deleted]

7.11.29 **R** [deleted]

7.11.30 **R** [deleted]

7.11.31 **R** [deleted]

7.11.32 **R** [deleted]

7.11.33 **R** [deleted]

7.11.34 **R** [deleted]

7.11.35 **R** [deleted]

7.11.36 **R** [deleted]

7.11.37 **R** [deleted]

7.11.38	R	[deleted]
7.11.39	R	[deleted]
7.11.40	R	[deleted]
7.11.41	R	[deleted]
7.11.42	R	[deleted]
7.11.43	R	[deleted]
7.11.44	R	[deleted]
7.11.45	R	[deleted]
7.11.46	R	[deleted]
7.11.47	G	[deleted]
7.11.48	R	[deleted]
7.11.49	R	[deleted]
7.11.50	R	[deleted]
7.11.51	R	[deleted]
7.11.52	R	[deleted]

7.11.53 **R** [deleted]

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7.11.58 **R** [deleted]

Valuation

7.11.59 **G** ■ GENPRU 1.3.29 R - ■ GENPRU 1.3.35 G (General requirements: Valuation adjustments or reserves) are particularly relevant for a *firm* trading credit derivatives, especially for credit default swaps that are also *securitisation positions*.

Other risks relating to credit derivatives

7.11.60 **R** A *firm* must be able to describe, demonstrate and explain to the *appropriate regulator* its trading strategies in relation to credit derivatives both in theory and in practice.

7.11.61 **G** ■ BIPRU 7.11.62 G - ■ BIPRU 7.11.63 G cover risks relating to credit derivatives that may not be captured in this section. This *guidance* is of particular relevance to the *overall financial adequacy rule*, the *overall Pillar 2 rule* and the *general stress and scenario testing rule*.

7.11.62 **G** ■ BIPRU 7.11.5 R requires a *firm* to recognise any premiums payable or receivable under the contract as notional *zero-specific-risk securities*. These *positions* are then entered into the *general market risk* framework. As premium payments paid under such contracts are contingent on no credit event occurring, a credit event could significantly change the *general market risk* capital requirement. A *firm* should consider, under the *overall Pillar 2 rule*, whether this risk means that the capital requirements under this section materially understate the *firm's general market risk* position.

7.11.63 **G** If a *firm* recognises profits on a non-accrual basis it should consider whether the capital requirements for its credit derivatives business adequately cover the risk that any recognised profit may not be achieved due to a credit event occurring. This includes *positions* for which the *firm* may have a perfect hedge in place.

7.11.64 **G** [deleted]

