Banks and Deposit Companies Act 1999:

Revised Framework for Regulatory Capital Assessment

Bermuda Monetary Authority
December 2008

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Note: See also the Framework for Regulatory Capital Assessment chart on page 6.

Introduction

1. Bermuda banks and deposit companies are required to meet, on an ongoing basis, the minimum licensing criteria set out in the Second Schedule to the Banks and Deposit Companies Act 1999 ('the Act'). This provides, among other requirements, that institutions must conduct their business in a prudent manner, including that they maintain capital commensurate with the nature and scope of their operations. The setting and monitoring of requirements for capital adequacy and the effective assessment of risk within institutions represent key elements in the framework of prudential oversight and control applied by the Bermuda Monetary Authority ('the Authority') to help protect the interests of depositors and potential depositors. The approach developed and applied by the Authority in that regard under the Act has reflected the regulatory standards designed and promulgated by the Basel Committee on Banking Supervision, the international standard-setting body. As a result, institutions licensed in Bermuda have been required to maintain at all times levels of capital in excess of the minimum international standards. Consistent with recent revisions to the international requirements - in particular, the adoption by the Basel Committee of an updated framework of capital measurement and related standards - the Authority now proposes to implement major changes to its present capital adequacy regime, as set out in this handbook.

2. The new capital measurement framework and standards are intended further to strengthen the soundness and stability of the banking system while avoiding as far as possible competitive distortions. This handbook brings together the different elements of the new framework, including the detailed methodologies for the calculation of the minimum capital requirement under Pillar 1 of the new Basel framework. As institutions are aware, these Pillar 1 requirements (which will essentially replace the present capital methodology) are reinforced by new obligations under Pillars 2 and 3 of the new Basel framework. As a result, institutions are expected to operate at all times in such a way as to ensure that their capital exceeds the minimum level resulting from the Pillar 1 calculation **and** remains at all times consistent with the overall capital requirement set by the Authority in consequence of the supervisory review process under Pillar 2 of the framework.

3. The new approach is also intended, through the application of more effective risk-sensitive requirements, to provide greater incentives for the adoption by banks of continuing enhancements in their risk management practices. The revised framework includes a range of options of increasing sophistication for determining the capital requirements for credit risk and operational risk. At the same time, the new approach retains significant aspects of the present international capital adequacy framework, including the general 'floor' requirement that no bank should operate with capital equivalent to less than 8% of its risk-weighted assets. The framework for calculating capital requirements for market risk also remains unchanged from that introduced by the Basel Committee in 1996 and incorporated into the Authority's regime. The definition of eligible capital is similarly unchanged for the time being, although firms should be aware that the Basel Committee is committed to reviewing the current rules defining the

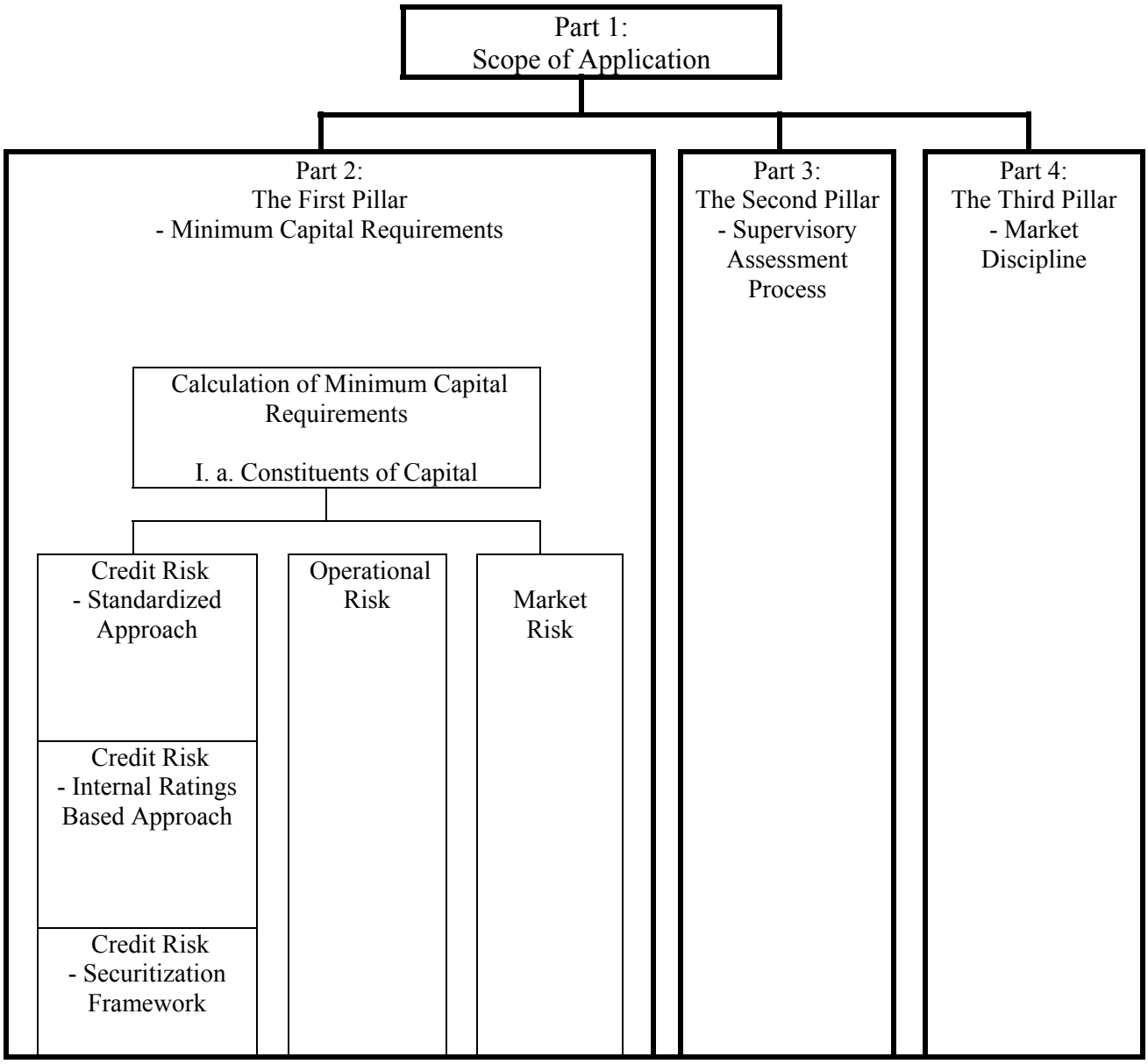
components of regulatory capital. Once the results of that work are available, the Authority will consider how and when to make any changes that prove necessary.

4. The attached provisions are set out in four parts – see illustration in the chart, overleaf. The first part, detailing the scope of application, explains how the capital requirements are applied within a group. The methodology for calculating the minimum capital requirements for credit risk, operational risk, and market risk is provided in the second part. The third part sets out the process for Pillar 2 supervisory review while the fourth part [to be added to this document at a later stage] sets out the market discipline requirements under Pillar 3.

5. The Authority will implement this new framework for all Bermuda banks and selected investment businesses as from 1 January 2009. Deposit companies, as specialized local institutions, may continue to apply the current framework for measuring capital adequacy until such time as they agree, case by case, with the Authority that it will be appropriate for them to migrate to the new methodology.

6. While this framework is aimed primarily at banks, it is recognised that the principles underlying Basel II may also be of relevance to some investment firms. The Authority will discuss and agree bilaterally with individual investment firms how Basel II will be applied to them. In the remainder of this paper, however, for ease of exposition, reference is made primarily to "banks".

Framework for Regulatory Capital Assessment



PART 1
Scope of Application

7. This capital measurement framework applies to institutions at both the solo level and, with a view to preserving the integrity of capital in institutions which have subsidiaries or which form part of wider groups, on a consolidated basis. Generally, depending on the specific nature of group structures, capital adequacy requirements apply to each tier within a banking group e.g. solo to a licensed bank, on a consolidated basis to separate banks and their subsidiaries within a group, and overall to a full financial group structure.

8. The scope of application of consolidated supervision includes all holding, subsidiary and associate companies of a licensed bank, engaged in banking or other relevant financial activities – see, in particular, the Authority's policy paper under the Act, The Approach to Consolidated Supervision. Group companies conducting insurance activities are not normally included within an accounting consolidation; the same generally applies to non-financial businesses within a banking group (see details below). Where a bank forms part of a non-financial group, consolidated supervision applies to the banking sub-group comprising the banking and financial activities conducted within the overall group. Exposures between the banking sub-group and the remainder of the group to which it belongs are monitored and controlled in order to 'ring-fence' the banking sub-group. A similar approach is taken for non-financial activities within a banking group or for material subsidiaries that may be excluded for some reason from the accounting consolidation. However, where non-financial activities are not deemed material in relation to overall group risks, they may exceptionally be included within the consolidation on de minimis grounds. In each case, the Authority agrees with licensed institutions the scope of consolidated supervision that is to apply, and the treatment of any non-consolidated activities within the group. At the same time, the Authority monitors and reviews not simply the total consolidated capital within banking groups, but also its location and distribution within the group.

Banking, securities and other financial subsidiaries

9. As noted above, the Authority seeks to capture, to the greatest extent possible, through consolidation all banking and other relevant financial activities (both regulated and unregulated) conducted within a group containing a bank. Majority-owned or controlled banking entities, securities entities and other financial entities must normally be fully consolidated. ('Financial entities' would include such businesses as financial leasing, credit card issuers, portfolio managers, investment advisers, custodians and safe-keepers of securities, and providers of other services ancillary to the business of banking; insurance activities are not included as 'financial activities' for these purposes.)

10. The Authority reviews carefully the appropriateness of recognizing in consolidated capital the minority interests that arise from the consolidation of less than wholly owned banking, securities or other financial entities. It adjusts the amount of such minority

interests that may be included in consolidated capital in the event the capital from such minority interests is not readily available to other group entities.

11. In a few instances, it may not be feasible or desirable to consolidate certain securities or other regulated financial entities. This would only be in cases where special factors arise – e.g. holdings have been acquired through debt previously contracted and held on a temporary basis, entities are subject to a different form of regulation, or where non-consolidation for regulatory capital purposes is otherwise required by law. In such cases, the Authority ensures that it obtains adequate information to allow it to take proper account of the entity in its consolidated supervision, including from relevant supervisors.

12. Where any majority-owned securities or other financial subsidiary is not consolidated for capital purposes, all equity and other regulatory capital investments in the entity that is attributable to the group is deducted in calculating banking capital; and the assets and liabilities, as well as third-party capital investments in the subsidiary are eliminated from the bank's balance sheet. The Authority then takes account of whether the non-consolidated entity for which the capital investment has been deducted continues to meet any relevant regulatory capital requirements. Where such a subsidiary faces a capital shortfall that cannot be promptly corrected, the shortfall is also deducted from the parent bank's capital.

Minority investments in banking, securities and other financial entities

13. Where a banking group holds significant minority investments (that is to say, stakes giving at least 20% control) in banking, securities or other financial entities, but without having an effective controlling interest, investments are excluded from the banking group's capital by deduction of the equity and other regulatory investments. However, under certain conditions, the Authority may agree to apply consolidation on a pro-rata basis. Pro-rata consolidation may be appropriate for joint ventures or where the Authority can otherwise be satisfied that the parent is legally or *de facto* expected to support the entity on a proportionate basis only and that other significant shareholders have the means and the willingness to support it proportionately.

14. The Authority also eliminates all cross-holdings of bank capital. Thus any holding by a Bermuda bank of equity capital in (or eligible loan stock issued by) a bank (wherever licensed) must be deducted in assessing the capital of the Bermuda bank in order to prevent artificial inflation of bank capital.

Insurance entities

15. Where a Bermuda bank owns an insurance subsidiary, or an insurance company is located within a wider banking group, the full entrepreneurial risks for the group must be recognized. Generally, full deduction applies in assessing regulatory capital for the bank and its group. The value of equity and other regulatory capital investments in insurance subsidiaries is thereby eliminated; the same approach applies to significant minority investments in insurance entities. (However, this is not normally necessary where the activity involves solely broking insurance risks, rather than underwriting them, unless the exposures can be seen to be material to the bank and its group). Under the deduction approach the bank excludes from its balance sheet relevant assets and liabilities, as well as any third party capital investments in an insurance subsidiary. The Authority expects banks to disclose publicly the regulatory approach taken with regard to insurance entities within their group in determining their reported capital positions.

16. The capital invested in a majority-owned or controlled insurance entity may exceed the amount of regulatory capital required for such an entity (leaving 'surplus capital' within the insurance entity). The Authority may be prepared to permit the recognition of such surplus capital in calculating a bank's capital adequacy, in limited circumstances. The Authority will not permit such recognition unless it can be fully satisfied that there is no regulatory or other obstacle to the prompt transfer of the surplus capital out of the insurance subsidiary as required; such recognition would also have regard to the practical implications of a transfer e.g. in terms of exchange rate and taxation effects or the consequences for external credit assessment ratings. Where such surplus capital is recognized, the amount deducted in calculating bank or group capital will be the lesser of the value of the investment and the regulatory capital requirement. (Where there is less than full ownership, surplus capital recognized must be proportionate to the percentage interest held). The amount representing the surplus capital is then risk-weighted as an equity investment.

17 Where a bank is permitted to recognize surplus capital in insurance subsidiaries, it must publicly disclose the amount of such surplus capital recognized in its capital. No recognition is given for surplus capital in significant minority-owned insurance entities, since the bank is unlikely to be able to direct the transfer of the capital in an entity that it does not control.

18. As with a non-consolidated financial subsidiary, the Authority ensures that majority-owned or controlled insurance subsidiaries, which are not consolidated and for which capital investments are deducted, are themselves adequately capitalized in order to reduce the possibility of future potential losses to the bank. In the event of a capital shortfall emerging, the Authority monitors corrective action taken by the subsidiary; and where timely remediation is not possible, the shortfall is also deducted from the parent bank's capital.

Significant investments in commercial entities

19. Where banks or their groups make significant minority or majority investments in commercial entities that exceed specified materiality levels, these are deducted in calculating bank capital. Where a bank invests an amount equal to or exceeding 15% of its regulatory capital in a commercial entity, such portion as exceeds the 15% level is deducted in calculating its regulatory capital. The same treatment applies where the aggregate amount of such investment in commercial entities exceeds 60% of capital.

20. Investments in significant minority and majority-owned and controlled commercial entities below the materiality levels noted above are risk-weighted at 100% for banks using the standardized approach, other than where the Authority determines that a higher weighting should apply based on the associated risks. Under an Internal Ratings Based ("IRB") approach, the investments are risk weighted in accordance with the methodology applied to holdings of equities, and will not be less than 100%.

Deduction of investments

21. Where investments are deducted pursuant to the above provisions, the deductions are made as to 50% from Tier 1 and 50% from Tier 2 capital.

22. Goodwill relating to entities subject to the deduction approach must be deducted from Tier 1 in the same manner as goodwill relating to consolidated subsidiaries, and the remainder of the investments should be deducted as provided for above.

23. The limits applying to Tier 2 and Tier 3 capital and on innovative Tier 1 instruments are based on the amount of Tier 1 capital after deduction of goodwill but before the deduction of investments pursuant to the above provisions. (Annex 1.1 provides an example of how to calculate the 15% limit for innovative Tier 1 instruments).

PART 2

Pillar I – Regulatory Capital and Risk Weighted Assets

Calculation of minimum capital requirements

1. The rules for calculating total minimum capital requirements for credit, market and operational risk under Pillar 1 of the new framework are set out in this part. The capital ratio represents the relationship between regulatory capital (as defined below) and total risk-weighted assets. The ratio applies both to the solo bank and, as appropriate, at consolidated/sub-consolidated level. No institution may operate with a total capital ratio lower than 8%. Tier 2 capital is limited to a maximum of 100% of Tier 1 capital. In each case, Pillar 1 capital requirements comprise the aggregate of:

- the credit risk requirements calculated in accordance with section B of this part, including credit counterparty risk on all over-the-counter ("OTC") derivatives, whether held in the banking or the trading book;
- the capital charge for operational risk calculated in accordance with section C of Part 2; and
- the capital charge for market risk pursuant to section D.

However, for the time being, the Authority continues to permit institutions for which the total market risk component remains at de minimis levels, to be exempt from reporting under the section D methodologies and to report all their positions under section B. But, in that case, they must also capture and weight their overall net short open position in foreign exchange (and commodities, in the event that any Bermuda institution were to seek to hold/trade such positions) in the traditional way.

Regulatory capital

2. The definition of eligible regulatory capital is set out in section A, paragraphs 8 –23, below.

3. It should be noted that the provisions set out in this paper generally omit for the time being the detailed rules applying to the IRB approach for credit risk. This reflects the fact no Bermuda institutions currently envisage moving to the IRB approach for credit risk in the short to medium term. Accordingly, the Authority will prepare and consult upon that portion of the relevant rules only as circumstances require.

4. At that stage, the Authority would also review the possible need to apply certain prudential floors during a transitional period as institutions moved over from Standardized to the IRB approach. It is likely that the Authority will wish to construct and apply such floors on a bank by bank basis, having regard to the need to allow a period in which to assess whether a bank's implementation of the new methodology is sound and effective. A similar approach is likely to be applied in the context of institutions seeking to move to Advanced Measurement Approaches for operational risk.

Banking book and trading book

5. Institutions are required to allocate their positions consistently and appropriately between their trading book and their banking book in order to ensure that, where they run material risk of losses in on- or off-balance-sheet positions arising from movements in market prices ('market risk'), an accurate assessment of the necessary capital cover for the quantum of these risks can be applied. Annex 2.1 sets out the definition of the trading book, and the detailed provisions that apply. The rules for calculating relevant capital charges in respect of market risks appear in section D of this part. Where an institution's exposure to market risk is judged de minimis, it is permitted exceptionally to report and calculate its aggregate capital charge on the basis of the standard banking book approach. This is the case where the trading book does not normally exceed 5% of its total business (on the basis set out in Annex 2.1; where the trading book exceeds 6% of business at any time, it will normally be required to move forthwith to a full market risk reporting and capital calculation). The Authority reviews regularly with each institution the nature and scope of trading book business and the continuing appropriateness of the reporting framework that is applied. Where the Authority identifies a likely risk that the nature of business may result in exposure to market risk exceeding de minimis levels, it agrees with the institution concerned arrangements for monitoring and periodic reporting to enable the position to be tracked.

6. Where the trading book of a banking group as a whole exceeds the de minimis threshold, licensed banking entities that are individually below the threshold may seek the Authority's approval to remain exempt from the trading book capital requirements at the solo level. Where the effect seems likely to be minimal in terms of resulting capital ratios, the Authority will normally take a pragmatic view. In calculating market risks, where particular positions within different licensed entities within a consolidated group are managed on a global basis, the Authority is prepared to give consent for offsetting to apply.

Risk-weighted assets

7. In the case of market risk and operational risk, total risk-weighted assets are determined by multiplying the calculated capital requirements by 12.5 (i.e. the reciprocal of the minimum capital ratio of 8%) and adding the resulting figures to the sum of banking book risk-weighted assets for credit risk.

A The constituents of capital

Core capital (basic equity or Tier 1)

8. The Authority attaches great importance to the quality of an institution's capital, in addition to the quantum of capital. Equity capital (comprising issued and full and non-cumulative perpetual preferred stock), together with disclosed reserves, represents a key element.

9. Notwithstanding this emphasis, certain other important constituents of an institution's capital base may legitimately be included within the system of measurement (subject to certain conditions, as set out in paragraphs 11 to 21 below).

10. Accordingly, long-term capital, for supervisory purposes, is defined in two tiers in such a way as to require at least 50% of an institution's capital base to consist of a core element comprising equity capital and published reserves from post-tax retained earnings (Tier 1). The other elements of long-term capital (supplementary capital) admitted into Tier 2 are limited to a maximum of 100% of Tier 1. Detailed definitions for the capital base elements, including these supplementary capital elements and the particular conditions attaching to their inclusion in the capital base, are set out below, with fuller details set out in Annex 2.2.

Supplementary capital (Tier 2)

Undisclosed reserves

11. Where institutions within banking groups may be permitted by overseas legal and accounting regimes to hold unpublished or hidden reserves, these may be included within Tier 2 capital provided they have been passed through the profit and loss account and have been accepted by the relevant supervisory authorities.

Revaluation reserves

12. In some circumstances, it may be permissible to revalue certain assets to reflect their current value, or something closer to their current value than historic cost. Such revaluations can arise in two ways:

(a) from a formal revaluation, carried through to the balance sheet, of institutions' own premises; or

(b) from a notional addition to capital of hidden values which arise from the practice of holding securities in the balance sheet valued at historic cost.

Such reserves may be included within supplementary capital provided that the assets are

considered by the Authority to be prudently valued, fully reflecting the possibility of price fluctuations and forced sale.

13. Where, under 12(b) above, substantial amounts of equities may be held within a banking group at historic cost but can be realized at current prices and used to offset losses, such 'latent' revaluation reserves can be included among supplementary elements of capital, provided they are subject to a substantial discount to reflect both market volatility and tax charges arising on realization. A 55% discount to the difference between market value and historic cost is applied.

General provisions/general loan-loss reserves

14. General provisions or general loan-loss reserves are created against the possibility of losses not yet identified. Where they do not reflect a known deterioration in the valuation of particular assets, these reserves qualify for inclusion in Tier 2 capital. Where, however, provisions or reserves have been created against identified losses or in respect of an identified deterioration in the value of any asset or group of subsets of assets, they are not freely available to meet unidentified losses which may subsequently arise elsewhere in the portfolio and do not possess an essential characteristic of capital. Such provisions or reserves cannot therefore be included in the capital base.

15. The Authority ensures in its supervisory process that the adequacy of provisions is carefully reviewed to take due account of any identified deterioration in value, and consequently that any general provisions or general loan-loss reserves included within the capital base are not intended to deal with the deterioration of particular assets, whether individual or grouped.

16. All elements in general provisions or general loan-loss reserves designed to protect an institution from identified deterioration in the quality of specific assets (whether foreign or domestic) are ineligible for inclusion in capital. This would apply also to any elements that reflect identified deterioration in assets subject to country risk, in real estate lending and in other problem sectors.

17. General provisions/general loan-loss reserves that qualify for inclusion in Tier 2 under the terms described above are subject to a limit of

(a) 1.25 % of weighted risk assets to the extent an institution uses the Standardized Approach for credit risk; and

(b) 0.6 percentage points of credit risk-weighted assets where an institution uses the IRB approach for credit risk.

Special apportioning provisions will apply in situations in which banks may eventually seek to make use of both standardized and IRB approaches.

Hybrid debt capital instruments

18. A number of capital instruments combine certain characteristics of equity and certain characteristics of debt. Each of these has particular features that can be considered to affect its quality as capital. Where such instruments have close similarities to equity, in particular when they are able to support losses on an on-going basis without triggering liquidation, they are eligible for inclusion in supplementary capital. The detailed requirements are set out in Annex 2.2.

Subordinated term debt

19. Subordinated term debt instruments have significant deficiencies as constituents of capital in view of their fixed maturity and inability to absorb losses except in a liquidation. These deficiencies justify an additional restriction on the amount of such debt capital that is eligible for inclusion within the capital base. Consequently, subordinated term debt instruments with a minimum original term to maturity of over five years may be included within the supplementary elements of capital, but only up to a maximum of 50% of the core capital element **and** subject to adequate amortization arrangements.

Short-term subordinated debt covering market risk (Tier 3*)*

20. The principal form of eligible capital to cover market risks consists of shareholders' equity and retained earnings (Tier I capital) and supplementary capital (Tier 2 capital) as defined above. However, institutions are also permitted to make some use of a third tier of capital ("Tier 3"). This consists of short-term subordinated debt as defined in paragraph 21, below; and it may be used for the *sole* purpose of meeting a proportion of the capital requirements for market risks, subject to the following conditions:

- Institutions are entitled to use Tier 3 capital solely to support market risks as defined in Part 2, section D of this paper. This means that any capital requirement arising in respect of credit and counter-party risk, including the credit counter-party risk in respect of OTCs and SFTs in both trading and banking books, needs to be met out of Tier 1 and Tier 2 capital;

- Tier 3 capital is limited to 250% of an institution's Tier 1 capital that is required to support market risks. This means that a minimum of about 28 1/2% of market risks needs to be supported by Tier 1 capital that is not required to support risks in the remainder of the book;

- Tier 2 elements may be substituted for Tier 3 up to the same limit of 250% in so far as the overall limits set out in paragraph 10 above are not breached, that is to say eligible Tier 2 capital may not exceed total Tier 1 capital, and long-term

subordinated debt may not exceed 50% of Tier 1 capital.

21. For short-term subordinated debt to be eligible as Tier 3 capital, it needs, if circumstances demand, to be capable of becoming part of an institution's permanent capital and thus be available to absorb losses in the event of insolvency. It must, therefore, at a minimum:

- be unsecured, subordinated and fully paid up;
- have an original maturity of at least two years;
- not be repayable before the agreed repayment date unless the Authority agrees; and
- be subject to a lock-in clause which stipulates that neither interest nor principal may be paid (even at maturity) if such payment means that the institution falls below or remains below its minimum capital requirement.

Deductions from capital

22. The following items must be deducted from the capital base for the purpose of calculating the risk-weighted capital ratio:

(i) Goodwill, as a deduction from Tier 1 capital elements;

(ii) Increase in equity capital resulting from a 'gain on sale' within the securitization exposure rules, as a deduction from Tier 1 capital elements [see paragraph 117, below];

(iii) Investments in subsidiaries engaged in banking and financial activities which have exceptionally not been consolidated. In any such case, deduction is from the aggregate of Tier 1 and Tier 2 capital; and the assets representing the investments in the relevant company would not be included in total assets for the purposes of computing the institution's ratio.

23. As noted in Part 1, paragraph 14 above, the Authority also applies a standard policy of deducting from an institution's capital any holdings of equity in (or other eligible capital instruments issued by) another bank in order to reduce the risk of systemic difficulties arising from artificial inflation of capital.

B Credit Risk

B (i) The Standardized Approach

24. The following provisions apply for risk weighting banking book exposures under the Standardized Approach. The Authority will also make available in due course detailed rules for the alternative Internal Ratings-Based (IRB) Approach. These will feature in Part 2 section E below. Institutions may only migrate to the IRB approach following receipt of written supervisory consent.

25. Exposures related to securitization are dealt with in section B (iv), below. Furthermore, the credit equivalent amounts of Securities Financing Transactions (SFT) and OTC derivatives that expose an institution to counter-party credit risk are to be calculated under the rules set out in Annex 2.3. In determining the risk weights in the standardized approach, institutions may use assessments by external credit assessment institutions recognized as eligible for capital purposes by the Authority in accordance with the criteria defined in paragraph 63, below. Exposures must be risk-weighted net of any specific provisions.

Individual claims

Claims on sovereigns

26. Claims on sovereigns and their central banks are risk weighted as follows:

Credit Assessment	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to B-	Below B-	Unrated
Risk Weight	0%	20%	50%	100%	150%	100%

27. Claims on the Government of Bermuda that are both denominated and funded in Bermuda dollars may be allocated a risk weight one category below the applicable weighting that is based on the country score. The Authority also permits the same treatment for claims on other sovereigns where the relevant supervisory authority applies the same treatment in its national rules.

28. For the purpose of risk weighting claims on sovereigns, the Authority also recognizes the country risk scores assigned by Export Credit Agencies (ECAs). The Authority is prepared to recognize ECAs which publish their risk scores and subscribe to the OECD agreed methodology. Institutions may choose to use the risk scores published by individual ECAs that are recognized by the Authority, or the consensus risk scores of ECAs participating in the "Arrangement on Officially Supported Export Credits". The OECD agreed methodology establishes eight risk score categories associated with

minimum export insurance premiums. These ECA risk scores correspond to risk weight categories as detailed below.

ECA Risk Scores	0 - 1	2	3	4 – 6	7
Risk Weight	0%	20%	50%	100%	150%

29. Claims on the Bank for International Settlements, the International Monetary Fund, the European Central Bank and the European Community are risk-weighted at 0%.

Claims on non-central government public sector entities (PSEs)

30. Claims on Bermuda PSEs receive a risk-weighting one category less favourable than the weighting of the relevant sovereign. Claims on foreign PSEs must be weighted at 100% other than where the supervisory authority in the jurisdiction concerned permits 'one category less favourable' treatment **and** that supervisory authority applies supervisory arrangements equivalent to those in Bermuda. In case of doubt as to the appropriate treatment, the views of the Authority should be sought.

Claims on multilateral development banks (MDBs*)*

31. The following very high quality MDBs qualify for 0% weighting, reflecting their high ratings, the quality and commitment of their shareholders and their highly prudent stance:

- the World Bank Group (IBRD and IFC)
- Asian Development Bank
- African Development Bank
- European Bank for Reconstruction and Development
- Inter-American Development Bank
- European Investment Bank
- European Investment Fund
- Nordic Investment Bank
- Caribbean Development Bank
- Islamic Development Bank
- Council of Europe Development Bank.

In the case of other MDBs, risk weights reflect external credit assessments, as for banks, but with no preferential treatment for short-term claims.

Claims on banks

32. Risk weights for banks are based on the external credit assessment for each institution. Unrated banks are risk-weighted at 50%. A preferential risk weight that is one category more favourable may be applied to claims with an original maturity of three months or less, subject to a floor of 20%. (This does not apply where short-term claims are expected to be rolled over – i.e. the effective maturity is longer than 3 months.) This treatment is available to both rated and unrated banks, but cannot be applied to any bank rated at 150%.

33. The applicable weightings are summarized in the table below.

Credit Assessment of Institutions	**AAA to AA-**	***A+ to A-***	**BBB+ to BBB-**	**BB+ to B-**	**Below B-**	**Unrated**
Risk Weight	20%	50%	50%	100%	150%	50%
Risk Weight for Short-term Claims	20%	20%	20%	50%	150%	20%

Claims on securities firms

34. The treatment set out in paragraph 32 above for banks also applies to any securities firm subject to equivalent supervision including the application of a risk-based capital test. Securities firms that are not subject to equivalent supervision are treated as normal corporate exposures.

Claims on corporates

35. The table below sets out the risk weighting of rated corporate claims, including claims on insurance companies. The standard risk weight for unrated claims on corporates is 100%. No claim on an unrated corporate may be given a risk weight preferential to that assigned to its sovereign of incorporation.

Credit Assessment	**AAA to AA-**	**A+ to A-**	**BBB+ to BB-**	**Below BB-**	**Unrated**
Risk Weight	20%	50%	100%	150%	100%

36. The Authority will monitor closely the continuing appropriateness of the standard risk weight for unrated claims in light of overall default experience. Where an institution prefers, it may in the alternative risk weight all its corporate claims at 100% without regard to external ratings. The Authority requires a single consistent approach to be adopted and applied, i.e. either to use ratings wherever available or not at all. To prevent "cherry-picking" of external ratings, an institution must obtain the Authority's approval before utilizing the standard 100% weighting option.

Claims included in the regulatory retail portfolios

37. Claims that qualify under the criteria listed below may be considered as retail claims for regulatory capital purposes and included in a regulatory retail portfolio. Exposures included in such a portfolio may be risk-weighted at 75%, except as provided in paragraphs 43-46, below for past due loans.

38. To be included in the regulatory retail portfolio, claims must meet the following four criteria:

- Orientation criterion - The exposure is to an individual person or persons or to a small business;

- Product criterion - The exposure takes the form of any of the following: revolving credits and lines of credit (including credit cards and overdrafts), personal term loans and leases (e.g. installment loans, auto loans and leases, student and educational loans, personal finance) and small business facilities and commitments. Securities (such as bonds and equities), whether listed or not, are specifically excluded from this category. Mortgage loans are excluded to the extent that they qualify for treatment as claims secured by residential property (see paragraphs 40-41, below).

- Granularity criterion - The Authority must be satisfied that the regulatory retail portfolio is sufficiently diversified to a degree that reduces the risks in the portfolio, warranting the 75% risk weight. The Authority applies the standard granularity criterion whereby no aggregate exposure to a single counterparty can exceed 0.2% of the overall regulatory retail portfolio.

- Low value of individual exposures. The maximum aggregated retail exposure to one counterparty cannot exceed an absolute threshold of $1 million.

39. The Authority will maintain under review whether the 75% risk weight may prove too low based on the default experience for these types of exposures.

Claims secured by residential property

40. Lending fully secured by mortgages on residential property that is or will be occupied by the borrower, or that is rented, is risk weighted at 35%. It is to be noted that this preferential risk-weight may be applied only to loans for residential purposes – i.e. for the purpose of financing the acquisition of residential property that is (or is to be) occupied by the borrower or rented out by him, and secured on that property by a first mortgage charge. (Any existing loans where the lender has taken a Memorandum of Deposit of Deeds (MODD) rather than a mortgage charge may be given concessionary treatment under this paragraph. However, after 31 December 2008, all new loans must be secured by a first legal mortgage in order to qualify for the concession.) Moreover, institutions may not treat an exposure as fully secured by residential property unless the loan represents 80% or less of the value of the property. The Authority expects institutions to have a policy for the valuation of property which provides for the use of independent professional valuation in exceptional circumstances, such as the valuation of unique/atypical properties or an extreme market downturn. Where a portion of a residential property loan exceeds 80% of current valuation, that portion may be weighted at 75% within the retail regulatory portfolio, provided it meets the requirements for such claims.

41. The Authority will maintain under review the default experience with such claims to determine the continuing appropriateness of the concessionary weighting.

Claims secured by commercial real estate

42. Commercial property lending generally qualifies for a standard 100% weighting. However, exceptionally, where the Authority is satisfied that an established well-developed market exists and that the conditions set out below apply, mortgages on office and/or multi-purpose commercial premises and/ or multi-tenanted commercial property may be weighted at 50% for the tranche that does not exceed the lower of 50% of market value or 60% of the mortgage lending value of the property securing the loan. Any exposure beyond these limits is 100% weighted. The relevant conditions are that a) losses stemming from commercial real estate lending up to the lower of 50% of the market value or 60% of loan to value (LTV) based on mortgage lending value (MLV) must not exceed 0.3% of the outstanding loans in any single year, and b) overall losses stemming from commercial real estate lending must not exceed 0.5% of the outstanding loans in any single year. Eligibility for the concessionary treatment ceases if either of the above tests is not met, and it can only be re-established once both tests are again met**.** Any claims that benefit from such treatment and fall past due become risk-weighted at 100%.

Past due loans

43. The unsecured portion of any loan (other than a qualifying residential mortgage loan) that is past due for more than 90 days, net of specific provisions (including partial write-offs), is risk-weighted at 150%. However, where specific provisions amount to no less than 20% of the outstanding amount of the loan, the unsecured portion is risk-weighted at 100%.

44. For the purpose of defining the secured portion of the past due loan, eligible collateral and guarantees are treated as for credit risk mitigation purposes (see paragraphs 77-93, below). Past due retail loans are to be excluded from the overall regulatory retail portfolio when assessing the granularity criterion specified in paragraph 38 above, for risk-weighting purposes.

45. Exceptionally, where a past due loan is fully secured by non-recognized forms of collateral (notably real estate) – see Annex 2.3 - a 100% risk weight may apply where provisions amount to at least 15% of the outstanding amount of the loan. These forms of collateral are not recognized elsewhere in the standardized approach. Such collateral must be subject to independent professional valuation, with a value equivalent to at least 120% of the amount of the loan.

46. In the case of qualifying residential mortgage loans, when such loans are past due for more than 90 days they are risk weighted at 100%, net of specific provisions. If such loans are past due but specific provisions are no less than 20% of their outstanding amount, the risk weight applicable to the remainder of the loan is reduced to 50%.

Higher-risk categories

47. The following claims are risk weighted at 150%:

- Claims on sovereigns, PSEs, banks, and securities firms rated below B-.
- Claims on corporates rated below BB-.
- Past due loans as set out in paragraph 43 above.
- Venture capital and private equity investments.

In addition, securitization tranches that are rated between BB+ and BB- are risk-weighted at 350% (see paragraph 121, below).

Other assets

48. Gold bullion held in own vaults or on an allocated basis (to the extent backed by bullion liabilities) is treated as cash and subject to a 0% weight. Cash items in course of

collection qualify for a 20% weight. The treatment of securitization exposures is presented separately in section B (iv). The standard risk weight for all other assets is 100%. Investments in equity or regulatory capital instruments issued by banks or securities firms are risk-weighted at 100%, where they do not fall to be deducted pursuant to the provisions in Part 1, above. Finally, it should be noted that, where institutions are, because of the limited extent of the market risks to which they are exposed, able to benefit from the relevant de minimis exemption, they must nonetheless apply a 100% credit risk weighting to their aggregate net short open position in foreign exchange in calculating their banking book capital requirement.

Off-balance sheet items

49. Under the standardized approach, off-balance-sheet items are converted into credit exposure equivalents through the use of credit conversion factors (CCF). Counter-party risk weightings for OTC derivative transactions are not subject to any specific ceiling.

50. Commitments with an original maturity up to one year and commitments with an original maturity over one year receive a CCF of 20% and 50%, respectively. However, any commitments that are unconditionally cancellable at any time by the bank without prior notice, or that effectively provide for automatic cancellation due to deterioration in a borrower's creditworthiness, receive a 0% CCF.

51. Direct credit substitutes, e.g. general guarantees of indebtedness (including standby letters of credit serving as financial guarantees for loans and securities) and acceptances (including endorsements with the character of acceptances) receive a CCF of 100%.

52. Sale and repurchase agreements and asset sales with recourse, where the credit risk remains with the bank receive a CCF of 100%.

53. A CCF of 100% is applied to the lending of banks' securities or the posting of securities as collateral by banks, including instances where these arise out of repo-style transactions (i.e. repurchase/ reverse repurchase and securities lending/securities borrowing transactions). See paragraphs 81-86, below for the calculation of risk-weighted assets where the credit converted exposure is secured by eligible collateral.

54. Forward asset purchases, forward deposits and partly paid shares and securities, which represent commitments with certain draw down receive a CCF of 100%.

55. Certain transaction-related contingent items (e.g. performance bonds, bid bonds, warranties and standby letters of credit related to particular transactions) receive a CCF of 50%.

56. Note issuance facilities (NIFs) and revolving underwriting facilities (RUFs) receive a CCF of 50%.

57. For short-term self-liquidating trade letters of credit arising from the movement of goods (e.g. documentary credits collateralized by the underlying shipment), a 20% CCF is applied to both issuing and confirming banks.

58. Where there is an undertaking to provide a commitment on an off-balance sheet item, the lower of the two applicable CCFs is to be applied.

59. The credit equivalent amount of OTC derivatives and SFTs that expose an institution to counter-party credit risk is calculated in accordance with the rules set out in Annex 2.3.

60. Institutions must closely monitor securities, commodities, and foreign exchange transactions that have failed, starting the first day they fail. A capital charge for failed transactions must be calculated in accordance with Annex 2.4.

61. With regard to unsettled securities, commodities, and foreign exchange transactions, institutions are exposed to counter-party credit risk from trade date and must develop and apply systems for tracking and monitoring on a timely basis the credit risk exposure arising from such unsettled transactions as part of their management information processes. Furthermore, when such transactions are not processed through a delivery-versus-payment (DvP) or payment-versus-payment (PvP) mechanism, a capital charge applies, as set out in Annex 2.4.

B (ii) External Credit Assessment Institutions (ECAIs)

62. Institutions are able to use assessments prepared by certain External Credit Assessment Institutions ('ECAIs') for determining the risk weights attaching to relevant credit exposures. Where applicable, ECAI ratings may be applied under the standardized approach in respect of claims on sovereigns, claims on banks and securities firms, and claims on corporate entities, as well as within the securitization framework for credit risk. For such ratings to be applicable, an ECAI must first be recognized as eligible by the Authority, and the appropriate mapping between individual ECAI ratings and the capital risk-weighting categories must have been determined by the Authority.

Eligibility Criteria

63. To qualify for recognition by the Authority, an ECAI must meet each of the criteria set out below. To qualify for recognition, an ECAI is not required to assess firms in more than one country. The Authority permits licensed institutions to make use of both solicited and unsolicited ratings from eligible ECAIs, consistent with the discretion provided to national authorities under Basel 2. However, the Authority reserves the right to exclude unsolicited ratings, either generally or in specific cases, where there are concerns about the quality of unsolicited ratings or the use of such ratings by an ECAI to exert untoward pressure to obtain solicited rating business.

- **Objectivity**: The methodology for assigning credit assessments must be rigorous, systematic, and subject to some form of validation based on historical experience. Moreover, assessments must be subject to ongoing review and be responsive to changes in financial condition. Before recognizing an assessment methodology for any market segment, the Authority requires to be satisfied that rigorous backtesting has been conducted, normally covering a period of three years.

- **Independence**: An ECAI must be independent and not subject to political or economic pressures with the potential to influence ratings that are given. The assessment process must include adequate safeguards to protect against a situation in which the composition of the ECAI's board of directors or of its shareholder base may be seen as creating a conflict of interest.

- **International access/Transparency**: Individual assessments must be available to both domestic and foreign institutions with legitimate interests and on equivalent terms. The general methodology used by the ECAI must be publicly available.

- **Disclosure**: An ECAI must disclose the following information: its assessment methodologies, including the definition of default, the time horizon, and the meaning of each rating; the actual default rates experienced in each assessment category; and transitions within the assessments, i.e. the likelihood of AA ratings becoming A over time.

- **Resources**: An ECAI must have sufficient resources to conduct credit assessments that are of a high quality. These resources should provide for substantial ongoing contact at both senior and operational levels within entities that are assessed, in order to add value to the credit assessments. Assessments must be based on methodologies combining both qualitative and quantitative approaches.

- **Credibility**: An ECAI's credit assessments must have credibility. In addition to fulfillment of the above criteria, the extent to which an ECAI's credit assessments are relied upon by independent third parties (investors, insurers, trading partners) is reviewed in judging its credibility. Additionally, credibility is underpinned by the effectiveness of internal procedures aimed at preventing the misuse of confidential information.

The Mapping Process

64. The Authority assigns the credit assessments of eligible ECAIs to the risk weights applicable under the standardized approach to credit risk. The Authority seeks to ensure that the mapping process is objective and results in risk weight assignments that are consistent with the overall framework for the weighting of credit risks within the standardized approach. In determining mappings, the Authority considers, among other matters, the size and scope of the pool of issuers covered by an ECAI, the range and meaning of the assessments assigned by the ECAI, and the definition of default that is employed by the ECAI. Further clarification of the mapping process employed by the Authority is set out in Annex 2.5.

Use of ECAI Ratings

65. In making use of credit assessments generated by eligible ECAIs, institutions must put in place procedures ensuring that they use their chosen ECAIs and the relevant ratings consistently for each type of claim, and do not 'cherry-pick' assessments provided by different ECAIs. In addition, institutions must make use of the relevant ratings for both risk weighting and risk management purposes.

66. Institutions must also make publicly available information, by types of claims, on the ECAIs that they use for risk weighting purposes, and including details of the risk weights associated with the particular rating grades as determined by the Authority through the

mapping process, together with the aggregated risk-weighted assets for each risk weight, based on the assessments of each eligible ECAI.

67. Where there is only one assessment by an ECAI chosen by an institution for a particular claim, that assessment must be used to determine the risk weight of the claim. Where there are assessments by two chosen ECAIs which map into different risk weights, the higher risk weight must be applied. In the case of three or more assessments with different risk weights being available, the higher of the two lowest risk weights is to be applied.

Issue vs. Issuer Assessment

68. Where an institution invests in a particular issue that has an issue-specific assessment, the risk weight of the claim is based on this assessment. Where the claim is not an investment in a specific assessed issue, the following two general principles apply:

- In circumstances where the borrower has a specific assessment for an issued debt – but the institution's claim is not an investment in this particular debt – a high quality credit assessment (one which maps into a risk weight lower than that which applies to an unrated claim) on that specific debt may only be applied to the institution's unassessed claim if this claim ranks pari passu or senior to the claim with an assessment in all respects. Where this is not the case, the credit assessment cannot be used and the unassessed claim must receive the risk weight for unrated claims.

- In circumstances where the borrower has an issuer assessment, this assessment typically applies to senior unsecured claims on that issuer. Consequently, only senior claims on that issuer will benefit from a high quality issuer assessment. Other unassessed claims of a highly assessed issuer will be treated as unrated. If either the issuer or a single issue has a low quality assessment (mapping into a risk weight equal to or higher than that which applies to unrated claims), an unassessed claim on the same counterparty will be assigned the same risk weight as is applicable to the low quality assessment.

69. Whether an institution intends to rely on an issuer – or an issue-specific – assessment, the assessment must take into account and reflect the entire amount of credit risk exposure held by the institution with regard to all payments owed to it.

70. In order to avoid any double-counting of credit enhancement factors, no supervisory recognition of credit risk mitigation techniques must be taken into account if the credit enhancement is already reflected in the issue-specific rating.

Domestic currency and foreign currency assessments

71. Where unrated exposures are risk weighted based on the rating of an equivalent exposure to that borrower, only foreign currency ratings may be used for exposures denominated in foreign currency. Where separate domestic currency ratings are given, these must be used to risk weight claims denominated in the domestic currency.

Short versus Long Term Assessments

72. For risk weighting purposes, short-term assessments are deemed to be issue-specific. They can only be used to derive risk weights for claims arising from the rated facility. They cannot be generalized to other short-term claims (other than in the particular case set out in paragraph 73 below). Short-term ratings cannot be used to support a risk weight for an unrated long-term claim, and may only be used for short-term claims against banks and corporate entities.

73. Under the standardized approach with respect to claims on banks, the Authority permits use of the preferential option whereby claims with an original maturity of three months or less may be given a risk weight that is one category more favorable than that for longer term claims, subject to a floor of 20%. This general preferential treatment for short-term claims applies to all claims on banks of up to three months' original maturity when there is no specific short-term claim assessment. Use of short term assessments is subject to meeting the standard eligibility criteria for the recognition of ECAIs. Where there is a short-term assessment, and such assessment maps into a risk weight that is more favorable (i.e., lower) or identical to that derived from the general preferential treatment, the short-term assessment may be used for the specific claim only. Where a specific short-term assessment for a short-term claim on a bank maps into a less favorable (i.e., higher) risk weight, the general preferential treatment for inter-bank claims cannot be used. All unrated short-term claims must receive the same risk weighting as that implied by the specific short-term assessment.

Level of Application of the Assessment

74. External assessments for one entity within a corporate group cannot be used to risk weight other entities within the same group.

Recognized ECAIs

75. The Authority has recognized the ECAIs set out in Annex 2.6 for use by institutions under the standardized approach for credit risk, as well as within the securitization framework for credit risk. Having regard to the work performed by the Committee of European Banking Supervisors ('CEBS') in relation to ECAIs, the Authority has recognized Standard & Poor's Rating Services, Moody's Investors Service and Fitch Ratings for these purposes and applies mapping to their ratings that is

consistent with that applied by CEBS. The mapping of the recognized ECAIs' ratings to risk weights is also set out in Annex 2.6. Where any changes are made either in the recognition of ECAIs or in the mappings that are to apply, the Authority will issue a revised Annex recording the changes. The specific mapping and risk weights that apply to ECAI assessments within the securitization framework are detailed in B(iv).

Process to be followed by Licensed Institutions

76. When seeking to apply ECAI ratings and their related risk weights to their exposures, institutions need to follow the process set out below:

- Determine one or more recognized ECAI(s) whose assigned ratings they will seek to apply in deriving risk weights for exposures in each external ratings-based portfolio. Regard should be had to whether a particular ECAI is able to provide reasonable coverage of an institution's exposures;

- Notify the Authority of nominated ECAI(s) and the extent of the application of the ECAI(s) within each of an institution's external ratings-based portfolios;

- Apply the ratings of the nominated ECAI(s) within each of the external ratings-based portfolios consistently;

- Treat exposures or issuers as "unrated" for risk-weighting purposes where there is no rating assigned to it by any recognized ECAI nominated by the institution;

- Seek the consent of the Authority to any subsequent changes to nominated ECAI(s) and to the application of ratings.

B(iii) Credit Risk Mitigation

77. In certain circumstances, licensed institutions are permitted to benefit from credit risk mitigation (or 'CRM') techniques in measuring their capital adequacy for credit risk under the standardized approach.

78. The Authority needs to satisfy itself that institutions have effective arrangements in place for the measurement, monitoring and control of their credit risks, within the overall framework of risk controls that is developed and applied. The Authority must also be satisfied that institutions hold adequate capital to support the totality of the risks in their business. In particular, the Authority undertakes specific reviews of institutions' techniques utilized to mitigate credit risk as part of its Pillar 2 assessment of the overall adequacy of their capital resources.

Credit Risk Mitigation (CRM) Techniques

79. General Considerations

a) Definition – Institutions use a number of different techniques to mitigate the credit risks to which they are exposed. For example, exposures may be collateralized by first priority claims, in whole or in part with cash or securities, a loan exposure may be guaranteed by a third party, an institution may buy a credit derivative to offset various forms of credit risk, or an institution may agree to net loans owed to it against deposits from the same counterparty.

   While the use of CRM techniques reduces or transfers credit risk, it simultaneously may increase other risks (residual risks). Residual risks include legal, operational, liquidity and market risks. Therefore, it is imperative that institutions employ robust procedures and processes to control these risks, including strategy; consideration of the underlying credit; valuation; policies and procedures; systems; control of roll-off risks; and management of concentration risk arising from the institution's use of CRM techniques and its interaction with the institution's overall credit risk profile. Where the Authority is not satisfied that these risks are adequately controlled, it is likely – pursuant to Pillar 2 – to impose additional capital charges or take other action.

b) Legal certainty – In order for institutions to obtain capital relief for any use of CRM techniques, the following minimum standards for legal documentation must be met. All documentation used in collateralized transactions and for documenting on-balance sheet netting, guarantees and credit derivatives must be binding on all parties and legally enforceable in all relevant jurisdictions. Institutions must have conducted sufficient legal review to verify this and have

a well-founded legal basis to reach this conclusion, and undertake such further review as may be necessary to ensure continuing enforceability.

c) No transaction in which CRM techniques are used should receive a higher capital requirement than an otherwise identical transaction where such techniques are not used.

d) The effects of CRM will not be double-counted. Therefore, the Authority will not grant any additional supervisory recognition of CRM for regulatory capital purposes on claims for which an issue-specific rating is used that already reflects that CRM. Principal-only ratings will also not be allowed within the framework of CRM.

e) The requirements under Pillar 3 (Part 4 of this Handbook) must also be observed for institutions to obtain capital relief in respect of any CRM techniques.

80. The following paragraphs set out the approach taken with regard to collateralized transactions, on-balance-sheet netting, guarantees and credit derivatives, maturity mis-match and other CRM techniques. Definitions of eligible financial collateral are set out in Annex 2.7. Certain more complex aspects of CRM, which are in the main not currently relevant for Bermuda's institutions, are referred to within Annexes 2.8-2.12**.** These elements will be available as institutions develop more sophisticated approaches.

81. Collateralized Transactions

a) Definition – A "collateralized transaction" is one in which institutions have a credit exposure, or a potential credit exposure, that is hedged in whole or in part by collateral posted by a counterparty[1], or by a third party on behalf of the counterparty.

b) "Eligible Financial Collateral" is cash, gold, debt securities, equities and/ or shares of mutual funds which meet the terms of Annex 2.7. Where institutions take Eligible Financial Collateral, they are permitted to reduce their credit exposure to a counter-party when calculating their capital requirements, to take account of the risk mitigating effect of the collateral.

A capital requirement is applied to an institution on either side of the collateralized transaction. For example, both repos and reverse repos are subject

[1] In this section, "counterparty" is used to denote a party to whom an institution has an on- or off-balance sheet credit exposure or a potential credit exposure. That exposure may, for example, take the form of a loan of cash or securities (where the counterparty would traditionally be called the borrower), of securities posted as collateral, of a commitment or of exposure under an OTC derivatives contract.

to capital requirements. Likewise, both sides of a securities lending and borrowing transaction are subject to explicit capital charges, as is the posting of securities in connection with a derivative exposure or other borrowing.

Where an institution, acting as an agent, arranges a repo-style transaction (i.e. repurchase/ reverse repurchase and securities lending/ borrowing transactions) between a customer and a third party and provides a guarantee to the customer that the third party will perform on its obligations, then the risk to the institution is the same as if the institution had entered into the transaction as a principal. In such circumstances, an institution is required to calculate capital requirements as if it were itself the principal.

c) In calculating Regulatory Capital for collateralized transactions, institutions are permitted to choose between the "*Simple Approach*" and the "*Comprehensive Approach*". The Simple Approach is described in detail below. The Comprehensive Approach is described in general terms below; the more detailed methodology appears in Annex 2.8.

Institutions may operate under either the Simple or the Comprehensive Approach – but not both – in the banking book, but only under the Comprehensive Approach in the trading book. Partial collateralization is recognized in both approaches. Mismatches between the maturity of the underlying exposure and the collateral are only allowed under the Comprehensive Approach.

d) Pre-conditions – Before capital relief will be granted in respect of any form of collateral, the four standards (or pre-conditions) set out below must be met under either approach:

(i) In addition to the general requirements for legal certainty set out in paragraph 79b) above, the legal mechanism by which collateral is pledged or transferred must ensure that the institution has the right to liquidate or take legal possession of it, in a timely manner, in the event of default, insolvency or bankruptcy (or one or more otherwise-defined credit events set out in the transaction documentation) of the counterparty (and, where applicable, of the custodian holding the collateral). Furthermore, institutions must take all steps necessary to fulfill those requirements under the law applicable to the institution's interest in the collateral for obtaining and maintaining an enforceable security interest, e.g., by registering it with a registrar, or for exercising a right to net or set off in relation to title transfer collateral.

(ii) In order for collateral to provide protection, the credit quality of the counterparty and the value of the collateral must not have a material positive correlation. For example, securities issued by the counterparty – or by any related group entity – would provide little protection and so would be ineligible.

(iii) Institutions must have clear and robust procedures for the timely liquidation of collateral to ensure that any legal conditions required for declaring the default of the counterparty and liquidating the collateral are observed, and that collateral can be liquidated promptly.

(iv) Where the collateral is held by a custodian, institutions must take reasonable steps to ensure that the custodian segregates the collateral from its own assets.

Collateralization: Simple Approach

82. Under the Simple Approach, the risk weighting of the collateral is substituted for the risk weighting of the counterparty with regard to the collateralized portion of the exposure (generally subject to a 20% floor) i.e. the risk weighting of the collateral instrument collateralizing or partially collateralizing the exposure replaces the risk weighting for the counterparty that would otherwise apply. However, for collateral to be recognized in the simple approach, the collateral must be pledged for at least the life of the exposure and it must be marked to market and revalued with a minimum frequency of six months. Those portions of claims collateralized by the market value of recognized collateral receive the risk weight applicable to the collateral. A minimum 20% weighting applies other than in the circumstances specified in 83 i) – iii) below. The remainder of the claim must be assigned the risk weight appropriate to the counterparty. As noted in paragraph 81b) above, a capital requirement is applied to institutions on either side of the collateralized transaction: for example, both repos and reverse repos are subject to capital requirements.

83. There are a number of exceptions to the Risk Weight Floor:

i) Repo- style transactions that fulfill the following criteria receive a risk weight of 10***%:***
   a) both the exposure and collateral are cash or a sovereign security or PSE security qualifying for 0% risk-weight in the standardized approach;
   b) exposure and collateral are both denominated in the same currency;
   c) either the transaction is overnight or else both the exposure and collateral are marked-to-market daily and subject to daily remargining

d) in the event of a counterparty's failure to remargin, the institution has the capability to liquidate the collateral no more than 4 business days after the last mark-to market;
e) the transaction is settled across a settlement system proven for that type of transaction;
f) the agreement is governed by standard market documentation for repo-style transactions in the securities concerned;
g) the documentation specifies that in the event of failure of the counterparty to satisfy an obligation to deliver cash or securities or to deliver margin, or other event of default, the transaction is immediately terminable; and
h) upon any event of default, whether or not the counterparty is insolvent or bankrupt, the institution has an unfettered legally enforceable right immediately to seize and liquidate the collateral for its benefit.

ii) OTC derivative transactions subject to daily mark-to-market, collateralized by cash and where there is no currency mismatch may receive a 0% risk weight. Such transactions collateralized by sovereign or PSE securities qualifying for a 0% risk weight in the standardized approach may receive a 10% risk weight.

iii) Where a transaction is collateralized, a 0% risk weight may be applied where the exposure and the collateral are denominated in the same currency, and either:

(a) the collateral is cash on deposit as defined in Annex 2.7, paragraph 1; or

(b) the collateral is in the form of sovereign/ Public Sector Entity securities eligible for a 0% risk weight, and its market value has been discounted by 20%.

Collateralization: Comprehensive Approach

84. Where institutions opt for the Comprehensive Approach, fuller offset of collateral against exposures is permitted, effectively reducing the exposure amount directly by the value ascribed to the collateral. In the Comprehensive Approach, when taking collateral, institutions must calculate their **adjusted** exposure to a counterparty for capital adequacy purposes in order to take account of the effects of collateral held. Using haircuts, institutions are required to adjust both the amount of the exposure to the counterparty and the value of any collateral received in support of that counterparty to take account of possible future fluctuations in the value of either[2], occasioned by market movements. This will produce volatility-adjusted amounts for both exposure and collateral. Unless

[2] Exposure amounts may vary where, for example, securities are being lent.

either side of the transaction is cash, the volatility-adjusted amount for the exposure will be higher than the exposure and for the collateral it will be lower.

85. Additionally, where the exposure and the collateral are held in different currencies, an additional downwards adjustment must be made to the volatility adjusted collateral amount to take account of possible future fluctuations in exchange rates.

86. The Comprehensive Approach for the treatment of collateral is also applied to calculate the counterparty risk charges for OTC derivatives and repo-style transactions booked in the trading book (see Annex 2.9). Annex 2.8 contains full details regarding the Comprehensive Approach for calculating regulatory capital for collateralised transactions.

On-balance Sheet Netting

87. Where institutions have legally enforceable netting arrangements for loans and deposits, they may calculate capital requirements on the basis of net credit exposures subject to the following conditions. Where an institution:

a) Has a well-founded legal basis for concluding that the netting or offsetting agreement is enforceable in each relevant jurisdiction, regardless of whether the counterparty is insolvent or bankrupt;

b) Is able at any time to determine those assets and liabilities with the same counterparty that are subject to the netting agreement;

c) Monitors and controls its roll-off risks; and

d) Monitors and controls the relevant exposures on a net basis,

it may use the net exposure of loans and deposits as the basis for its capital adequacy calculation in accordance with the formula in Annex 2.8, paragraph 8. Assets (loans) are treated as exposures and liabilities (deposits) as collateral. The haircuts will be zero except when a currency mismatch exists. A ten business day holding period will apply when daily mark-to-market is conducted and all the requirements contained in Annex 2.8 (paragraphs 12 & 30), in paragraphs 91 and 92 below, and in Annex 2.11, also apply.

Guarantees and Credit Derivatives

88. Where guarantees or credit derivatives are direct, explicit, irrevocable and unconditional, and the Authority is satisfied that institutions fulfill certain minimum operational conditions relating to risk management processes listed in Annex 2.10, institutions are permitted to take account of such credit protection in calculating capital requirements.

89. A range of guarantors and protection providers are recognized and a substitution approach applies. Thus, only guarantees issued by or protection provided by entities with a lower risk weight than the counterparty will lead to reduced capital charges since the protected portion of the counterparty exposure is assigned the risk weight of the guarantor or protection provider, whereas the uncovered portion retains the risk weight of the underlying counterparty.

90. There are certain operational requirements common to guarantees and credit derivatives. A guarantee (counter-guarantee) or credit derivative must represent a direct claim on the protection provider and must be explicitly referenced to specific exposures or a pool of exposures, so that the extent of the cover is clearly defined and incontrovertible. Other than where there is non-payment by a protection purchaser of money due in respect of the credit protection contract, it must be irrevocable; there must be no clause in the contract that would allow the protection provider unilaterally to cancel the credit cover or that would increase the effective cost of cover as a result of deteriorating credit quality in the hedged exposure[3]. It must also be unconditional; there should be no clause in the protection contract outside the direct control of the institution that could prevent the protection provider from being obligated to pay out in a timely manner in the event that the original counterparty fails to make the payment(s) due. Certain additional operational requirements are set out in detail in Annex 2.10.

Maturity Mismatches

91. Where the residual maturity of the CRM is less than that of the underlying credit exposure, a maturity mismatch occurs. Where there is a maturity mismatch and the CRM has an original maturity of less than one year, the CRM is not recognized for capital purposes. In other cases where there is a maturity mismatch, partial recognition is given to the CRM for regulatory capital purposes as detailed below. Under the Simple Approach for collateral, maturity mismatches are **not** permitted and no benefit can be taken for CRM.

92. The maturity of the underlying exposure and the maturity of the hedge should both be defined conservatively. The effective maturity of the underlying should be gauged as the longest possible remaining time before the counterparty is scheduled to fulfill its obligation, taking into account any applicable grace period. For the hedge, embedded options that may reduce the term of the hedge should be taken into account so that the shortest possible effective maturity is used. Where a call is at the discretion of the protection seller, the maturity will always be at the first call date. If the call is at the discretion of the protection-buying institution but the terms of the arrangement at origination of the hedge contain a positive incentive for the buying institution to call the transaction before contractual maturity, the remaining time to the first call date will be

[3] Note that the irrevocability condition does not require that the credit protection and the exposure be maturity matched; rather that the maturity agreed *ex ante* may not be reduced *ex post* by the protection provider. Paragraph 92 in this paper sets out the treatment of call options in determining remaining maturity for credit protection.

deemed to be the effective maturity. For example, where there is a step-up in cost in conjunction with a call feature or where the effective cost of cover increases over time even if credit quality remains the same or increases, the effective maturity will be the remaining time to the first call. (See also Annex 2.11 with regard to maturity mismatch.)

93. Certain other points related to the treatment of CRM Techniques should be noted:

a) Treatment of pools of CRM techniques - In the case where an institution has multiple CRM techniques covering a single exposure (e.g., an institution has both collateral and guarantee partially covering an exposure), it must subdivide the exposure into portions covered by each type of CRM technique (e.g., portion covered by collateral, portion covered by guarantee) and the risk-weighted assets of each portion must be calculated separately. When credit protection provided by a single protection provider has differing maturities, the exposure must be similarly subdivided into separately protected portions.

b) See also Annex 2.12 with regard to the treatment of first to default and second to default credit derivatives.

B(iv) Securitization Framework

Scope and definitions of transactions covered under the securitization framework

94. Institutions must apply the securitization framework for determining regulatory capital requirements on exposures arising from traditional and synthetic securitizations or similar structures that contain features common to both. Since securitizations may be structured in many different ways, the capital treatment of a securitization exposure must be determined on the basis of its economic substance rather than its legal form. The Authority will look to the economic substance of a transaction to determine whether it should be subject to the securitization framework for purposes of determining regulatory capital. Institutions are encouraged to consult with the Authority when there is uncertainty about whether a given transaction should be considered a securitization. For example, transactions involving cash flows from real estate (e.g., rents) may be considered specialized lending exposures, if warranted.

95. A traditional securitization is a structure where the cash flow from an underlying pool of exposures is used to service at least two different stratified risk positions or tranches reflecting different degrees of credit risk. Payments to the investors depend upon the performance of the specified underlying exposures, as opposed to being derived from an obligation of the entity originating those exposures. The stratified/ tranched structures that characterize securitizations differ from ordinary senior/subordinated debt instruments in that junior securitization tranches can absorb losses without interrupting contractual payments to more senior tranches, whereas subordination in a senior/subordinated debt structure is a matter of priority of rights to the proceeds of liquidation.

96. A synthetic securitization *is a* structure with at least two different stratified risk positions or tranches that reflect different degrees of credit risk where credit risk of an underlying pool of exposures is transferred, in whole or in part, through the use of funded (e.g., credit-linked notes) or unfunded (e.g., credit default swaps) credit derivatives or guarantees that serve to hedge the credit risk of the portfolio. Accordingly, the investors' potential risk is dependent upon the performance of the underlying pool.

97. Institutions' exposures to a securitization ("securitization exposures") can include but are not restricted to the following: asset-backed securities, mortgage-backed securities, credit enhancements, liquidity facilities, interest rate or currency swaps, credit derivatives and tranched cover (i.e. where credit protection is obtained for tranches of exposure of different seniority –see Annex 2.10, paragraph 10, attached). Reserve accounts, such as cash collateral accounts, recorded as an asset by the originating institution must also be treated as securitization exposures.

98. Underlying instruments in the pool being securitized may include but are not restricted to the following: loans, commitments, asset-backed and mortgage-backed securities, corporate bonds, equity securities, and private equity investments. The underlying pool may include one or more exposures.

Definitions and general terminology

Originating institution

99. For risk-based capital purposes, an institution is considered to be an originator with regard to a certain securitization if it meets either of the following conditions:

(a) The institution originates directly or indirectly underlying exposures included in the securitization; or
(b) The institution serves as a sponsor of an asset-backed commercial paper (ABCP) conduit or similar program that acquires exposures from third-party entities. In the context of such programs, an institution would generally be considered a sponsor and, in turn, an originator if it, in fact or in substance, manages or advises the program, places securities into the market, or provides liquidity and/or credit enhancements.

Asset-backed commercial paper (ABCP) programme

100. An asset-backed commercial paper (ABCP) programme predominately issues commercial paper with an original maturity of one year or less that is backed by assets or other exposures held in a bankruptcy-remote, special purpose entity.

Clean-up call

101. A clean-up call is an option that permits the securitization exposures (e.g., asset-backed securities) to be called before all of the underlying exposures or securitization exposures have been repaid. In the case of traditional securitizations, this is generally accomplished by repurchasing the remaining securitization exposures once the pool balance or outstanding securities have fallen below some specified level. In the case of a synthetic transaction, the clean-up call may take the form of a clause that extinguishes the credit protection.

Credit enhancement

102. A credit enhancement is a contractual arrangement in which the institution retains or assumes a securitization exposure and, in substance, provides some degree of added protection to other parties to the transaction.

Credit-enhancing interest-only strip

103. A credit-enhancing interest-only strip (I/O) is an on-balance sheet asset that (i) represents a valuation of cash flows related to future margin income, and (ii) is subordinated.

Early amortization

104. Early amortization provisions are mechanisms that, once triggered, allow investors to be paid out prior to the originally stated maturity of the securities issued. For risk-based capital purposes, an early amortization provision will be considered either controlled or non-controlled. A controlled early amortization provision must meet all of the following conditions.

(a) The institution must have an appropriate capital/liquidity plan in place to ensure that it has sufficient capital and liquidity available in the event of an early amortization.

(b) Throughout the duration of the transaction, including the amortization period, there is the same pro rata sharing of interest, principal, expenses, losses and recoveries based on the institution's and investors' relative shares of the receivables throughout the receivables outstanding at the beginning of each month.

(c) The institution must set a period for amortization that would be sufficient for at least 90% of the total debt outstanding at the beginning of the early amortization period to have been repaid or recognized as in default; and

(d) The pace of repayment should not be any more rapid than would be allowed by straight-line amortization over the period set out in criterion (c).

An early amortization provision that does not satisfy the conditions for a controlled early amortization provision will be treated as a non-controlled early amortization provision.

Excess spread

105. Excess spread is generally defined as gross finance charge collections and other income received by the trust or special purpose entity (SPE, specified in paragraph 107, below) minus certificate interest, servicing fees, charge-offs, and other senior trust or SPE expenses.

Implicit support

106. Implicit support arises when an institution provides support to a securitization in excess of its predetermined contractual obligation.

Special purpose entity (SPE)

107. An SPE is a corporation, other form of entity, or trust arrangement, organized for a specific purpose, the activities of which are limited to those appropriate to accomplish the purpose of the SPE, and the structure of which is intended to isolate the SPE from the credit risk of an originator or seller of exposures. SPEs are commonly used as financing vehicles in which exposures are sold to a trust or similar entity in exchange for cash or other assets funded by debt issued by the trust.

Operational requirements for the recognition of risk transference

108. The following operational requirements are applicable to the standardized approach of the securitization framework; they will also apply in due course to the IRB approach.

(a) Operational requirements for traditional securitizations

109. An originating institution may exclude securitized exposures from the calculation of risk-weighted assets only if all of the following conditions have been met. Institutions meeting these conditions must still hold regulatory capital against any securitization exposures they retain.

(a) Significant credit risk associated with the securitized exposures has been transferred to third parties.

(b) The transferor does not maintain effective or indirect control over the transferred exposures. The assets are legally isolated from the transferor in such a way (e.g., through the sale of assets or through sub-participation) that the exposures are put beyond the reach of the transferor and its creditors, even in bankruptcy or receivership. These conditions must be supported by an opinion provided by a qualified legal counsel.

The transferor is deemed to have maintained effective control over the transferred credit risk exposures if it: (i) is able to repurchase from the transferee the previously transferred exposures in order to realize their benefits; or (ii) is obligated to retain the risk of the transferred exposures. The transferor's retention of servicing rights to the exposures will not necessarily constitute indirect control of the exposures.

(c) The securities issued are not obligations of the transferor. Thus, investors who purchase the securities only have claim to the underlying pool of exposures.

(d) The transferee is an SPE and the holders of the beneficial interests in that entity have the right to pledge or exchange them without restriction.

(e) Clean-up calls must satisfy the conditions set out in paragraph 112, below.

(f) The securitization does not contain clauses that (i) require the originating institution to alter systematically the underlying exposures such that the pool's weighted average credit quality is improved unless this is achieved by selling assets to independent and unaffiliated third parties at market prices; (ii) allow for increases in a retained first loss position or credit enhancement provided by the originating institution after the transaction's inception; or (iii) increase the yield payable to parties other than the originating institution, such as investors and third-party providers of credit enhancements, in response to a deterioration in the credit quality of the underlying pool.

(b) Operational requirements for synthetic securitizations

110. For synthetic securitizations, the use of CRM techniques (i.e. collateral, guarantees and credit derivatives) for hedging the underlying exposure may be recognized for risk-based capital purposes only if the conditions outlined below are satisfied:

(a) Credit risk mitigants must comply with the requirements as set out in the Authority's rules governing CRM techniques – see paragraphs 77-93, above**.**

(b) Eligible collateral is limited to that specified in Annex 2.7**.** Eligible collateral pledged by SPEs may be recognized.

(c) Eligible guarantors are defined in paragraph 6 of Annex 2.10**.** Institutions may not recognize SPEs as eligible guarantors in the securitization framework.

(d) Institutions must transfer significant credit risk associated with the underlying exposure to third parties.

(e) The instruments used to transfer credit risk may not contain terms or conditions that limit the amount of credit risk transferred, such as those provided below:

- Clauses that materially limit the credit protection or credit risk transference (e.g. significant materiality thresholds below which credit protection is deemed not to be triggered even if a credit event occurs or those that allow for the termination of the protection due to deterioration in

the credit quality of the underlying exposures);

- Clauses that require the originating institution to alter the underlying exposures to improve the pool's weighted average credit quality;
- Clauses that increase the institutions' cost of credit protection in response to deterioration in the pool's quality;
- Clauses that increase the yield payable to parties other than the originating institution, such as investors and third-party providers of credit enhancements, in response to a deterioration in the credit quality of the reference pool; and
- Clauses that provide for increases in a retained first loss position or credit enhancement provided by the originating institution after the transaction's inception.

(f) An opinion must be obtained from a qualified legal counsel that confirms the enforceability of the contracts in all relevant jurisdictions.

(g) Clean-up calls must satisfy the conditions set out in paragraph 112, below.

111. For synthetic securitizations, the effect of applying CRM techniques for hedging the underlying exposure is treated according to the requirements set out in paragraphs 77-93, above**.** Where there is a maturity mismatch, the capital requirement is determined in accordance with paragraphs 91-93, above and Annex 2.11**.** When the exposures in the underlying pool have different maturities, the longest maturity must be taken as the maturity of the pool. Maturity mismatches may arise in the context of synthetic securitizations when, for example, an institution uses credit derivatives to transfer part or all of the credit risk of a specific pool of assets to third parties. When the credit derivatives unwind, the transaction will terminate. This implies that the effective maturity of the tranches of the synthetic securitization may differ from that of the underlying exposures. Institutions originating synthetic securitizations must treat such maturity mismatches in the following manner. An institution using the standardized approach for securitization must deduct all retained positions that are unrated or rated below investment grade. Where an institution is permitted to use the IRB approach, it must deduct unrated, retained positions if the treatment of the position is deduction as specified in Annex 2.13. Accordingly, when deduction is required, maturity mismatches are not taken into account. For all other securitization exposures, the institution must apply the maturity mismatch treatment set out in paragraphs 91-93, above and Annex 2.11.

(c) Operational requirements and treatment of clean-up calls

112. For securitization transactions that include a clean-up call, no capital will be required due to the presence of a clean-up call if the following conditions are met: (i) the exercise of the clean-up call must not be mandatory, in form or in substance, but rather must be at the discretion of the originating institution; (ii) the clean-up call must not be structured to avoid allocating losses to credit enhancements or positions held by investors

or otherwise structured to provide credit enhancement; and (iii) the clean-up call must only be exercisable when 10% or less of the original underlying portfolio, or securities issued remain, or, for synthetic securitizations, when 10% or less of the original reference portfolio value remains.

113. Securitization transactions that include a clean-up call that does not meet all of the criteria stated in paragraph 112, above result in a capital requirement for the originating institution. For a traditional securitization, the underlying exposures must be treated as if they were not securitized. Additionally, institutions must not recognize in regulatory capital any gain-on-sale, as defined in paragraph 117, below. For synthetic securitizations, the institution purchasing protection must hold capital against the entire amount of the securitized exposures as if they did not benefit from any credit protection. If a synthetic securitization incorporates a call (other than a clean-up call) that effectively terminates the transaction and the purchased credit protection on a specific date, the institution must treat the transaction in accordance with paragraph 111 above and paragraphs 91-93 and Annex 2.11.

114. If a clean-up call, when exercised, is found to serve as a credit enhancement, the exercise of the clean-up call must be considered a form of implicit support provided by the institution and must be treated in accordance with the Authority's rules for securitization transactions.

Treatment of securitization exposures

Calculation of capital requirements

115. Institutions are required to hold regulatory capital against all of their securitization exposures, including those arising from the provision of credit risk mitigants to a securitization transaction, investments in asset-backed securities, retention of a subordinated tranche, and extension of a liquidity facility or credit enhancement, as set out in the following sections. Repurchased securitization exposures must be treated as retained securitization exposures. Where institutions have received approval to use an IRB approach for relevant exposures, they should refer to Annex 2.13.

(a) Deduction

116. When an institution is required to deduct a securitization exposure from regulatory capital, the deduction must be taken 50% from Tier 1 and 50% from Tier 2 with the one exception noted in paragraph 117, below. Credit enhancing I/Os (net of the amount that must be deducted from Tier 1 pursuant to paragraph 117) are deducted 50% from Tier 1 and 50% from Tier 2. Deductions from capital may be calculated net of any specific provisions taken against the relevant securitization exposures.

117. Institutions must deduct from Tier 1 any increase in equity capital resulting from a securitization transaction, such as that associated with expected future margin income (FMI) resulting in a gain-on-sale that is recognized in regulatory capital. Such an increase

in capital is referred to as a "gain-on-sale" for the purposes of the securitization framework. Moreover, for the purposes of the EL provision calculation as set out in the Authority's rules for the IRB approach, securitization exposures do not contribute to the EL amount. Similarly, any specific provisions against securitization exposures are not to be included in the measurement of eligible provisions.

(b) Implicit support

118. When an institution provides implicit support to a securitization, it must, at a minimum, hold capital against all of the exposures associated with the securitization transaction as if they had not been securitized. Additionally, institutions may not recognize in regulatory capital any gain-on-sale, as defined in paragraph 117, above. Furthermore, the institution is required to disclose publicly that (a) it has provided non-contractual support and (b) the capital impact of doing so.

Operational requirements for use of external credit assessments

119. The following operational criteria concerning the use of external credit assessments apply in the standardized and IRB approaches of the securitization framework:

(a) To be eligible for risk-weighting purposes, the external credit assessment must take into account and reflect the entire amount of credit risk exposure the institution has with regard to all payments owed to it. For example, if an institution is owed both principal and interest, the assessment must fully take into account and reflect the credit risk associated with timely repayment of both principal and interest.

(b) The external credit assessments must be from an eligible ECAI as recognized by the Authority in accordance with its rules for the use of ECAIs with the following exception. In contrast with standard provision governing international access and transparency set out in the eligibility criteria stipulated in paragraph 63, above, an eligible credit assessment must be publicly available. In other words, a rating must be published in an accessible form and included in the ECAI's transition matrix. Consequently, ratings that are made available only to the parties to a transaction do not satisfy this requirement.

(c) Eligible ECAIs must have a demonstrated expertise in assessing securitizations, which may be evidenced by strong market acceptance.

(d) An institution must apply external credit assessments from eligible ECAIs consistently across a given type of securitization exposure. Furthermore, an institution cannot use the credit assessments issued by one ECAI for one or more tranches and those of another ECAI for other positions (whether retained or purchased) within the same securitization structure that may or may not be rated by the first ECAI. Where two or more eligible ECAIs can be used and these assess the credit risk of the same securitization exposure differently, paragraph 67

above, applies.

(e) Where CRM is provided directly to an SPE by an eligible guarantor defined in paragraph 6 of Annex 2.10**,** and is reflected in the external credit assessment assigned to a securitization exposure(s), the risk weight associated with that external credit assessment should be used. In order to avoid any double counting, no additional capital recognition is permitted. If the CRM provider is not recognized as an eligible guarantor in paragraph 6 of Annex 2.10**,** the covered securitization exposures should be treated as unrated.

(f) In the situation where a credit risk mitigant is not obtained by the SPE but rather applied to a specific securitization exposure within a given structure (e.g. ABS tranche), the institution must treat the exposure as if it is unrated and then use the CRM treatment outlined in the Authority's Standardized approach rules for CRM or, where appropriate, in the Authority's rules for the application of the foundation IRB approach to recognize the hedge.

Standardized approach for securitization exposures

(a) Scope

120. Institutions that apply the standardized approach to credit risk for the type of underlying exposure(s) securitized must use the standardized approach under the securitization framework.

(b) Risk weights

121. The risk-weighted asset amount of a securitization exposure is computed by multiplying the amount of the position by the appropriate risk weight determined in accordance with the following tables. For off-balance sheet exposures, institutions must apply a CCF and then risk weight the resultant credit equivalent amount. If such an exposure is rated, a CCF of 100% must be applied. For positions with long-term ratings of B+ and below and short-term ratings other than A-1/ P-1, A-2/ P-2, A-3/ P-3, deduction from capital as defined in paragraph 116, above is required. Deduction is also required for unrated positions with the exception of the circumstances described in paragraphs 125 to 129, below.

Long-term rating category

External Credit Assessment	A A A to AA-	A+ to A-	BBB+ to BBB-	BB+ to BB-	B+ and below or Unrated
Risk Weight	20%	50%	100%	350%	Deduction

Short-term rating category

External Credit Assessment	A-1/ P-1	A-2/ P-2	A-3/ P-3	All other ratings or unrated
Risk Weight	20%	50%	100%	Deduction

122. The capital treatment of positions retained by originators, liquidity facilities, credit risk mitigant and securitizations of revolving exposures are identified separately. The treatment of clean-up calls is provided in paragraphs 112 to 114, above.

Investors may recognize ratings on below-investment grade exposures

123. Only third-party investors, as opposed to institutions that serve as originators, may recognize external credit assessments that are equivalent to BB+ to BB- for risk weighting purposes of securitization exposures.

Originators to deduct below-investment grade exposures

124. Originating institutions as defined in paragraph 8, above must deduct all retained securitization exposures rated below investment grade (i.e. BBB-).

Exceptions to general treatment of unrated securitization exposures

125. As noted in the tables above, unrated securitization exposures must be deducted. However, the following exceptions apply: (i) the most senior exposure in a securitization, (ii) exposures that are in a second loss position or better in ABCP programs and meet the requirements outlined in paragraph 128, below, and (iii) eligible liquidity facilities.

Treatment of unrated most senior securitization exposures

126. If the most senior exposure in a securitization of a traditional or synthetic securitization is unrated, an institution that holds or guarantees such an exposure may determine the risk weight by applying the "look-through" treatment, provided the composition of the underlying pool is known at all times. Institutions are not required to consider interest rate or currency swaps when determining whether an exposure is the most senior in a securitization for the purpose of applying the "look-through" approach.

127. In the look-through treatment, the unrated most senior position receives the average risk weight of the underlying exposures subject to supervisory review. Where the institution is unable to determine the risk weights assigned to the underlying credit risk exposures, the unrated position must be deducted.

Treatment of exposures in a second loss position or better in ABCP programs

128. Deduction is not required for those unrated securitization exposures provided by sponsoring institutions to ABCP programs that satisfy the following requirements:

(a) The exposure is economically in a second loss position or better and the first loss position provides significant credit protection to the second loss position;

(b) The associated credit risk is the equivalent of investment grade or better; and

(c) The institution holding the unrated securitization exposure does not retain or provide the first loss position.

129. Where these conditions are satisfied, the risk weight is the greater of (i) 100% or (ii) the highest risk weight assigned to any of the underlying individual exposures covered by the facility.

Risk weights for eligible liquidity facilities

130. For eligible liquidity facilities as defined in paragraph 132, below and where the conditions for use of external credit assessments in paragraph 119 are not met, the risk weight applied to the exposure's credit equivalent amount is equal to the highest risk weight assigned to any of the underlying individual exposures covered by the facility.

Credit conversion factors for off-balance sheet exposures

131. For risk-based capital purposes, institutions must determine whether, according to the criteria outlined below, an off-balance sheet securitization exposure qualifies as an 'eligible liquidity facility' or an 'eligible servicer cash advance facility'. All other off-balance sheet securitization exposures will receive a 100% Credit Conversion Factor (CCF).

Eligible liquidity facilities

132. Institutions are permitted to treat off-balance sheet securitization exposures as eligible liquidity facilities if the following minimum requirements are satisfied:

(a) The facility documentation must clearly identify and limit the circumstances under which it may be drawn. Draws under the facility must be limited to the amount that is likely to be repaid fully from the liquidation of the underlying exposures and any seller-provided credit enhancements. In addition, the facility must not cover any losses incurred in the underlying pool of exposures prior to a draw, or be structured such that draw-down is certain (as indicated by regular or continuous draws);

(b) The facility must be subject, where the IRB approach applies, to an asset quality test that precludes it from being drawn to cover credit risk exposures that are in default as defined in the relevant portion of the Authority's rules. In addition, if the exposures that a liquidity facility is required to fund are externally rated securities, the facility can only be used to fund securities that are externally rated investment grade at the time of funding;

(c) The facility cannot be drawn after all applicable (e.g. transaction-specific and program-wide) credit enhancements from which the liquidity would benefit have been exhausted; and

(d) Repayment of draws on the facility (i.e., assets acquired under a purchase agreement or loans made under a lending agreement) must not be subordinated to any interests of any note holder in the program (e.g. ABCP program) or subject to deferral or waiver

133. Where these conditions are met, the institution may apply a 20% CCF to the amount of eligible liquidity facilities with an original maturity of one year or less, or a 50% CCF if the facility has an original maturity of more than one year. However, if an external rating of the facility itself is used for risk-weighting the facility, a 100% CCF must be applied.

Eligible liquidity facilities available only in the event of market disruption

134. Institutions may apply a 0% CCF to eligible liquidity facilities that are only available in the event of a general market disruption (i.e. whereupon more than one SPE across different transactions are unable to roll over maturing commercial paper, and that inability is not the result of an impairment in the SPE's credit quality or in the credit quality of the underlying exposures). To qualify for this treatment, the conditions provided in paragraph 132 must be satisfied. Additionally, the funds advanced by the institution to pay holders of the capital market instruments (e.g. commercial paper) when there is a

general market disruption must be secured by the underlying assets, and must rank at least *pari passu* with the claims of holders of the capital market instruments.

Treatment of overlapping exposures

135. An institution may provide several types of facilities that can be drawn under various conditions. The same institution may be providing two or more of these facilities. Given the different triggers found in these facilities, it may be the case that an institution provides duplicative coverage to the underlying exposures. In other words, the facilities provided by an institution may overlap since a draw on one facility may preclude (in part) a draw under the other facility. In the case of overlapping facilities provided by the same institution, the institution does not need to hold additional capital for the overlap. Rather, it is only required to hold capital once for the position covered by the overlapping facilities (whether they are liquidity facilities or credit enhancements). Where the overlapping facilities are subject to different conversion factors, the institution must attribute the overlapping part to the facility with the highest conversion factor. However, if overlapping facilities are provided by different institutions, each institution must hold capital for the maximum amount of the facility.

Eligible servicer cash advance facilities

136. With specific approval from the Authority, where contractually provided for, servicers may advance cash to ensure an uninterrupted flow of payments to investors so long as the servicer is entitled to full reimbursement and this right is senior to other claims on cash flows from the underlying pool of exposures. Approved undrawn servicer cash advances or facilities that are unconditionally cancellable without prior notice are eligible for a 0% CCF.

Treatment of credit risk mitigation for securitization exposures

137. The treatment below applies to an institution that has obtained a credit risk mitigant on a securitization exposure. Credit risk mitigants include guarantees, credit derivatives, collateral and on-balance sheet netting. Collateral in this context refers to that used to hedge the credit risk of a securitization exposure rather than the underlying exposures of the securitization transaction.

138. When an institution other than the originator provides credit protection to a securitization exposure, it must calculate a capital requirement on the covered exposure as if it were an investor in that securitization. If an institution provides protection to an unrated credit enhancement, it must treat the credit protection provided as if it were directly holding the unrated credit enhancement.

Collateral

139. Eligible collateral is limited to that recognized under the standardized approach for CRM – see Annex 2.7**.** Collateral pledged by SPEs may be recognized.

Guarantees and credit derivatives

140. Credit protection provided by the entities listed in paragraph 6 of Annex 2.10 may be recognized. SPEs cannot be recognized as eligible guarantors.

141. Where guarantees or credit derivatives fulfill the minimum operational conditions as specified in the Authority's CRM rules (see Annex 2.10)**,** institutions can take account of such credit protection in calculating capital requirements for securitization exposures.

142. Capital requirements for the guaranteed/ protected portion are calculated according to CRM for the standardized approach as specified in paragraphs 9-12 of Annex 2.10**.**

Maturity mismatches

143. For the purpose of setting regulatory capital against a maturity mismatch, the capital requirement is determined in accordance with paragraphs 91-93, above and Annex 2.11**.** When the exposures being hedged have different maturities, the longest maturity must be used.

Capital requirement for early amortization provisions

Scope

144. As described below, an originating institution is required to hold capital against all or a portion of the investors' interest (i.e. against both the drawn and un-drawn balances related to the securitized exposures) when:

(a) It sells exposures into a structure that contains an early amortization feature; and

(b) The exposures sold are of a revolving nature. These involve exposures where the borrower is permitted to vary the drawn amount and repayments within an agreed limit under a line of credit (e.g., credit card receivables and corporate loan commitments).

145. The capital requirement should reflect the type of mechanism through which an early amortization is triggered.

146. For securitization structures where the underlying pool comprises revolving and term exposure, an institution must apply the relevant early amortization treatment (outlined below in paragraphs 148-155) to that portion of the underlying pool containing revolving exposures.

147. Institutions are not required to calculate a capital requirement for early amortizations in the following situations:

(a) Replenishment structures where the underlying exposures do not revolve and the early amortization ends the ability of the institution to add new exposures;

(b) Transactions of revolving assets containing early amortization features that mimic term structures (i.e., where the risk on the underlying facilities does not return to the originating institution);

(c) Structures where an institution securitizes one or more credit line(s) and where investors remain fully exposed to future draws by borrowers even after an early amortization event has occurred,

(d) The early amortization clause is solely triggered by events not related to the performance of the securitized assets or the selling institution, such as material changes in tax laws or regulations.

Maximum capital requirement

148. For an institution subject to the early amortization treatment, the total capital charge for all of its positions is subject to a maximum capital requirement (i.e. a 'cap') equal to the greater of (i) that required for retained securitization exposure, or (ii) the capital requirement that would apply had the exposures not been securitized. In addition, institutions must deduct the entire amount of any gain-on-sale and credit enhancing I/Os arising from the securitization transaction in accordance with paragraphs 116 and 117, above.

Mechanics

149. The originator's capital charge for the investors' interest is determined as the product of (a) the investors' interest, (b) the appropriate CCF (as discussed below), and (c) the risk weight appropriate to the underlying exposure type, as if the exposures had not been securitized. As described below, the CCFs depend upon whether the early amortization repays investors through a controlled or non-controlled mechanism. They also differ according to whether the securitized exposures are uncommitted retail credit lines (e.g. credit card receivables) or other credit lines (e.g. revolving corporate facilities). A line is considered uncommitted if it is unconditionally cancellable without prior notice.

Determination of CCFs for controlled early amortization features

150. An early amortization feature is considered controlled when the definition as specified in paragraph 104, above is satisfied.

Uncommitted retail exposures

151. For uncommitted retail credit lines (e.g., credit card receivables) in securitizations containing controlled early amortization features, institutions must compare the three-month average excess spread defined in paragraph 105 to the point at which the institution is required to trap excess spread as economically required by the structure (i.e. excess spread trapping point).

152. In cases where such a transaction does not require excess spread to be trapped, the trapping point is deemed to be 4.5 percentage points.

153. The institution must divide the excess spread level by the transaction's excess spread trapping point to determine the appropriate segments and apply the corresponding conversion factors, as outlined in the following table.

Controlled early amortization features

	Uncommitted	Committed
Retail credit lines	**3-month average excess spread Credit Conversion Factor (CCF)** 133.33% of trapping point or more 0% CCF less than 133.33% to 100% of trapping point 1% CCF less than 100% to 75% of trapping point 2% CCF less than 75% to 50% of trapping point 10% CCF less than 50% to 25% of trapping point 20% CCF less than 25% 40% CCF	90% CCF
Non-retail credit lines	90% CCF	90% CCF

154. Institutions are required to apply the conversion factors set out above for controlled mechanisms to the investors' interest referred to in paragraph 149, above.

Other exposures

155. All other securitized revolving exposures (i.e. those that are committed and all non-retail exposures) with controlled early amortization features will be subject to a CCF of 90% against the off-balance sheet exposures.

Determination of CCFs for non-controlled early amortization features

156. Early amortization features that do not satisfy the definition of a controlled early amortization as specified in paragraph 104, above will be considered non-controlled and treated as follows.

a) Uncommitted retail exposures

157. For uncommitted retail credit lines (e.g. credit card receivables) in securitizations containing non-controlled early amortization features, institutions must make the comparison described in paragraph 151, above.

158. The institution must divide the excess spread level by the transaction's excess spread trapping point to determine the appropriate segments and apply the corresponding conversion factors, as outlined in the following table.

Non-controlled early amortization features

	Uncommitted	**Committed**
Retail credit Lines	**3-month average excess spread Credit Conversion Factor (CCF)** 133.33% or more of trapping point 0% CCF less than 133.33% to 100% of trapping point 5% CCF less than 100% to 75% of trapping point 15% CCF less than 75% to 50% of trapping point 50% CCF less than 50% of trapping point 100% CCF	100% CCF
Non-retail credit lines	100% CCF	100% CCF

Other exposures

159. All other securitized revolving exposures (i.e. those that are committed and all non-retail exposures) with non-controlled early amortization features will be subject to a CCF of 100% against the off-balance sheet exposures.

C OPERATIONAL RISK

A. Definition of operational risk

160. Operational risk is defined in paragraph 4 of the Authority's paper, 'The Management of Operational Risk' (May 2007).

B. The measurement methodologies

161. Three methods are recognized for calculating operational risk capital charges in a continuum of increasing sophistication and risk sensitivity: (i) the Basic Indicator Approach; (ii) the Standardized Approach; and (iii) Advanced Measurement Approaches (AMA). Institutions are encouraged to move along the spectrum of available approaches as they develop more sophisticated operational risk measurement systems and practices. In order to make use of the Standardized Approach and AMA, an institution must satisfy the Authority that it meets the qualifying criteria set out in paragraphs 174-177 and 178-182 as appropriate.

162. The Authority reviews the general appropriateness of the capital requirement resulting from the operational risk approach used by each institution (whether Basic Indicator Approach, Standardized Approach or AMA). Where it has concerns, it will take them into account as part of its Pillar 2 assessment process. Internationally active institutions and institutions with significant operational risk exposures (for example, specialized processing banks) are expected to use an approach that is more sophisticated than the Basic Indicator Approach and that is appropriate for the risk profile of the institution. An institution will be permitted to use the Basic Indicator or Standardized Approach for some parts of its operations and an AMA for others provided certain minimum criteria are met, see paragraphs 194-197, below.

163. An institution is not permitted to choose to revert to a simpler approach once it has been approved for a more advanced approach without supervisory approval. However, if the Authority determines that an institution using a more advanced approach no longer meets the qualifying criteria for this approach, it may require it to revert to a simpler approach for some or all of its operations, until it meets the conditions specified by the Authority for returning to a more advanced approach.

1. The Basic Indicator Approach

164. Institutions using the Basic Indicator Approach must hold capital for operational risk equal to the average over the previous three years of a fixed percentage (denoted alpha) of positive annual gross income. Figures for any year in which annual gross income is negative or zero should be excluded from both the numerator and denominator when calculating the average. Where negative gross income distorts the

Pillar 1 capital charge, the Authority will take that into account as part of its pillar 2 assessment process.

The charge may be expressed as follows:

$$K_{BIA}=[\sum(GI_{1...n} \times \alpha)]/n$$

where:
K_{BIA} = the capital charge under the Basic Indicator Approach
GI = annual gross income, where positive, over the previous three years
N = number of the previous three years for which gross income is positive
α = 15%.

165. For this purpose, gross income is defined as net interest income plus net non-interest income as disclosed in the audited financial statements. It is intended that this measure should: (i) be gross of any provisions (e.g. for unpaid interest); (ii) be gross of operating expenses, including fees paid to outsourcing service providers[4]; (iii) exclude realized profits/losses from the sale of securities in the banking book[5]; and (iv) exclude extraordinary or irregular items as well as income derived from insurance.

166. The Basic Indicator Approach represents a point of entry basis and no specific criteria attach to its use. However, all institutions are encouraged to comply with the Basel Committee's guidance on *Sound Practices for the Management and Supervision of Operational Risk,* February 2003.

2. The Standardized Approach

167. In the Standardized Approach, institutions' activities are divided into eight business lines: corporate finance, trading & sales, retail banking, commercial banking, payment & settlement, agency services, asset management, and retail brokerage. The business lines are defined in detail in Annex 2.15.

168. Within each business line, gross income is a broad indicator that serves as a proxy for the scale of business operations and thus the likely scale of operational risk exposure within each of these business lines. The capital charge for each business line is calculated by multiplying gross income by a factor (denoted beta) assigned to that business line. Beta serves as a proxy for the industry-wide relationship between the operational risk loss experience for a given business line and the aggregate level of gross income for that business line. It should be noted that in the Standardized

[4] In contrast to fees paid for services that are outsourced, fees received by institutions that provide outsourcing services are to be included in the definition of gross income.
[5] Realized profits/losses from securities classified as "held to maturity" and "available for sale", which typically constitute items of the banking book (e.g. under certain accounting standards), are also excluded from the definition of gross income.

Approach gross income is measured for each business line, not the whole institution, i.e. in corporate finance, the indicator is the gross income generated in the corporate finance business line.

169. The total capital charge is calculated as the three-year average of the simple summation of the regulatory capital charges across each of the business lines in each year. In any given year, negative capital charges (resulting from negative gross income) in any business line may offset positive capital charges in other business lines without limit. However, where the aggregate capital charge across all business lines within a given year is negative, then the input to the numerator for that year will be zero. Where negative gross income distorts the Pillar 1 capital charge, the Authority will take that into account as part of its Pillar 2 assessment process. The total capital charge may be expressed as:

$$K_{TSA} = \{\sum_{\text{years } 1\text{-}3} \max [\sum(GI_{1\text{-}8} \times \beta_{1\text{-}8}), 0]\}/3$$

where:

K_{TSA} = the capital charge under the Standardized Approach
$GI_{1\text{-}8}$ = annual gross income in a given year, as defined above in the Basic Indicator Approach, for each of the eight business lines
$\beta_{1\text{-}8}$ = a fixed percentage relating the level of required capital to the level of the gross income for each business line as set out below.

Business Lines	**Beta Factors**
Corporate finance (β_1)	18%
Trading and sales (β_2)	18%
Retail banking (β_3)	12%
Commercial banking (β_4)	15%
Payment and settlement (β_5)	18%
Agency services (β_6)	15%
Asset management (β_7)	12%
Retail brokerage (β_8)	12%

3. Advanced Measurement Approaches (AMA)

170. Under the AMA, the regulatory capital requirement equals the risk measure generated by the institution's internal operational risk measurement system using the quantitative and qualitative criteria for the AMA discussed below. Use of the AMA is subject to written approval from the Authority.

171. Where internationally active foreign banking subsidiaries within a banking group do not represent a material part of the whole, the Authority will be prepared, where local supervisors agree, to agree an allocation mechanism for determining their regulatory capital requirement for operational risk. The Authority's approval is conditional on its being satisfied that the allocation mechanism is appropriate and can be supported empirically. Boards and senior management of relevant subsidiaries are responsible for conducting their own assessment of the entity's operational risks and controls, and for ensuring that it is adequately capitalized in respect of these risks.

172. Subject to supervisory approval as discussed in paragraph 183(d), below**,** the incorporation of a well-reasoned estimate of diversification benefits may be factored in at the group-wide level or at the banking subsidiary level. However, any banking subsidiaries whose host supervisors determine that they must calculate stand-alone capital requirements may not incorporate group-wide diversification benefits in their AMA calculations (e.g. where an internationally active banking subsidiary is deemed to be significant, the banking subsidiary may incorporate the diversification benefits of its own operations - those arising at the sub-consolidated level - but may not incorporate the diversification benefits of the parent).

173. The appropriateness of the allocation methodology will be reviewed with consideration given to the stage of development of risk-sensitive allocation techniques and the extent to which it reflects the level of operational risk in the legal entities and across the banking group. The Authority expects that AMA banking groups will continue efforts to develop increasingly risk-sensitive operational risk allocation techniques, notwithstanding initial approval of techniques based on gross income or other proxies for operational risk.

C. Qualifying criteria

1. The Standardized Approach

174. In order to qualify for use of the Standardized Approach, an institution must satisfy the Authority that, at a minimum:

- Its board of directors and senior management, as appropriate, are actively involved in the oversight of the operational risk management framework;
- It has an operational risk management system that is conceptually sound and is implemented with integrity; and
- It has sufficient resources in the use of the approach in the major business lines as well as the control and audit areas.

175. The Authority may require a period of initial monitoring of the outcome implementation by an institution of the Standardized Approach before permitting its use for regulatory capital purposes.

176. An institution must develop specific policies and have documented criteria for mapping gross income for current business lines and activities into the standardized

framework. The criteria must be reviewed and adjusted for new or changing business activities as appropriate. The principles for business line mapping are set out in Annex 2.15.

177. Where an internationally active institution makes use of the Standardized Approach, it must also meet the following additional criteria:

(a) The institution must have an operational risk management system with clear responsibilities assigned to an operational risk management function. The operational risk management function is responsible for developing strategies to identify, assess, monitor and control/mitigate operational risk; for codifying firm-level policies and procedures concerning operational risk management and controls; for the design and implementation of the firm's operational risk assessment methodology; and for the design and implementation of a risk-reporting system for operational risk.

(b) As part of the institution's internal operational risk assessment system, the institution must systematically track relevant operational risk data including material losses by business line. Its operational risk assessment system must be closely integrated into the risk management processes of the institution. Its output must be an integral part of the process of monitoring and controlling the institutions operational risk profile. For instance, this information must play a prominent role in risk reporting, management reporting, and risk analysis. The institution must have techniques for creating incentives to improve the management of operational risk throughout the firm.

(c) There must be regular reporting of operational risk exposures, including material operational losses, to business unit management, senior management, and to the board of directors. The institution must have procedures for taking appropriate action according to the information within the management reports.

(d) The institution's operational risk management system must be well documented. The institution must have a routine in place for ensuring compliance with a documented set of internal policies, controls and procedures concerning the operational risk management system, which must include policies for the treatment of noncompliance issues.

(e) The institution's operational risk management processes and assessment system must be subject to validation and regular independent review. These reviews must include both the activities of the business units and of the operational risk management function.

(f) The institution's operational risk assessment system (including the internal validation processes) must be subject to regular review by external auditors and/or supervisors.

2. Advanced Measurement Approaches (AMA)

(i) General standards

178. In order to qualify for use of the AMA, an institution must satisfy the Authority that, at a minimum:

- Its board of directors and senior management, as appropriate, are actively involved in the oversight of the operational risk management framework;
- It has an operational risk management system that is conceptually sound and is implemented with integrity; and
- It has sufficient resources in the use of the approach in the major business lines as well as the control and audit areas.

179. Where an institution meets the relevant criteria, the AMA calculation will nonetheless be subject to a period of initial monitoring by the Authority before it can be used for regulatory capital purposes in order to determine its credibility and appropriateness. As discussed below, an institution's internal measurement system must reasonably estimate unexpected losses based on the combined use of internal and relevant external loss data, scenario analysis and bank-specific business environment and internal control factors. The institution's measurement system must also be capable of supporting an allocation of economic capital for operational risk across business lines in a manner that creates incentives to improve business line operational risk management.

(ii) Qualitative standards

180. An institution must meet the following qualitative standards before it is permitted to use an AMA for operational risk capital:

(a) The institution must have an independent operational risk management function that is responsible for the design and implementation of the institution's operational risk management framework. The operational risk management function is responsible for codifying firm-level policies and procedures concerning operational risk management and controls; for the design and implementation of the firm's operational risk measurement methodology; for the design and implementation of a risk-reporting system for operational risk; and for developing strategies to identify, measure, monitor and control/mitigate operational risk.

(b) The institution's internal operational risk measurement system must be closely integrated into the day-to-day risk management processes of the institution. Its output must be an integral part of the process of monitoring and controlling the institution's operational risk profile. For instance, this information must play a prominent role in risk reporting, management reporting, internal capital allocation, and risk analysis. The institution must have techniques for allocating operational risk capital to major business lines and for creating

incentives to improve the management of operational risk throughout the firm.

(c) There must be regular reporting of operational risk exposures and loss experience to business unit management, senior management, and to the board of directors. The institution must have procedures for taking appropriate action according to the information within the management reports.

(d) The institution's operational risk management system must be well documented. The institution must have a routine in place for ensuring compliance with a documented set of internal policies, controls and procedures concerning the operational risk management system, which must include policies for the treatment of noncompliance issues.

(e) Internal and/or external auditors must perform regular reviews of the operational risk management processes and measurement systems. This review must include both the activities of the business units and of the independent operational risk management function.

(f) The validation of the operational risk measurement system by external auditors and/or supervisory authorities must include the following:

- Verifying that the internal validation processes are operating in a satisfactory manner; and

- Making sure that data flows and processes associated with the risk measurement system are transparent and accessible. In particular, it is necessary that auditors and supervisory authorities are in a position to have easy access, whenever they judge it necessary and under appropriate procedures, to the system's specifications and parameters.

(iii) Quantitative standards

AMA soundness standard

181. While there is no fixed formula that must be used for generating the operational risk measure for regulatory capital purposes, an institution must be able to demonstrate that its approach captures potentially severe 'tail' loss events. Whatever approach is used, the institution must demonstrate that its operational risk measure meets a soundness standard comparable to that of the internal ratings-based approach for credit risk, (i.e. comparable to a one year holding period and a 99.9^{th} percentile confidence interval).

182. While this provides significant flexibility to institutions in the development of an operational risk management system, they must have and maintain rigorous procedures for operational risk model development and independent model validation. The Authority, in common with supervisory bodies internationally, will

keep under review evolving industry practices and accumulated data and estimated capital requirements in the light of experience, to determine whether refinements to the framework may be required.

Detailed criteria

183. The following quantitative standards apply to internally-generated operational risk measures for purposes of calculating the regulatory minimum capital charge:

(a) The internal operational risk measurement system must reflect the full scope of operational risk defined in the Authority's policy paper, 'The Management of Operational Risk' and the loss event types set out in Annex 2.16.

(b) The Authority requires that the institution calculate its regulatory capital requirement as the sum of expected loss (EL) and unexpected loss (UL), unless the institution can demonstrate that it is adequately capturing EL in its internal business practices. That is, to base the minimum regulatory capital requirement on UL alone, the institution must be able to demonstrate to the satisfaction of the Authority that it has measured and accounted for its EL exposure.

(c) An institution's risk measurement system must be sufficiently 'granular' to capture the major drivers of operational risk affecting the shape of the tail of the loss estimates.

(d) Risk measures for different operational risk estimates must be added for purposes of calculating the regulatory minimum capital requirement. However, the institution may be permitted to use internally determined correlations in operational risk losses across individual operational risk estimates, provided it can demonstrate to the satisfaction of the Authority that its systems for determining correlations are sound, implemented with integrity, and take into account the uncertainty surrounding any such correlation estimates (particularly in periods of stress). The institution must validate its correlation assumptions using appropriate quantitative and qualitative techniques.

(e) Any operational risk measurement system must have certain key features to meet the Authority's soundness standard set out in this section. These elements must include the use of internal data, relevant external data, scenario analysis and factors reflecting the business environment and internal control systems.

(f) An institution needs to have a credible, transparent, well-documented and verifiable approach for weighting these fundamental elements in its overall operational risk measurement system. For example, there may be cases where estimates of the 99.9th percentile confidence interval based primarily on internal and external loss event data would be unreliable for business lines with a heavy-tailed loss distribution and a small number of observed losses. In such cases, scenario analysis, and business environment and control factors, may play a more dominant role in the risk measurement system. Conversely, operational loss

event data may play a more dominant role in the risk measurement system for business lines where estimates of the 99.9th percentile confidence interval based primarily on such data are deemed reliable. In all cases, the institution's approach for weighting the four fundamental elements should be internally consistent and avoid the double counting of qualitative assessments or risk mitigants already recognized in other elements of the framework.

Internal data

184. Institutions must track internal loss data in accordance with the criteria set out below. The tracking of internal loss event data is an essential prerequisite to the development and functioning of a credible operational risk measurement system. Internal loss data is crucial for tying an institution's risk estimates to its actual loss experience. This can be achieved in a number of ways, including using internal loss data as the foundation of empirical risk estimates, as a means of validating the inputs and outputs of the institution's risk measurement system, or as the link between loss experience and risk management and control decisions.

185. Internal loss data is most relevant when it is clearly linked to an institution's current business activities, technological processes and risk management procedures. Therefore, an institution must have documented procedures for assessing the on-going relevance of historical loss data, including those situations in which judgment overrides, scaling, or other adjustments may be used, to what extent they may be used and who is authorized to make such decisions.

186. Internally generated operational risk measures used for regulatory capital purposes must be based on a minimum five-year observation period of internal loss data, whether the internal loss data is used directly to build the loss measure or to validate it. When the bank first moves to the AMA, a three-year historical data window is acceptable (including such period of parallel calculation as may be required by the Authority).

187. To qualify for regulatory capital purposes, an institution's internal loss collection processes must meet the following standards:

- To assist in supervisory validation, an institution must be able to map its historical internal loss data into the relevant level 1 supervisory categories defined in Appendixes A and B of the Authority's policy paper, 'The Management of Operational Risk' (May 2007) and to provide these data to the Authority upon request. It must have documented, objective criteria for allocating losses to the specified business lines and event types. However, it is left to the institution to decide the extent to which it applies these categorizations in its internal operational risk measurement system.

- An institution's internal loss data must be comprehensive in that it captures all material activities and exposures from all appropriate sub-systems and geographic locations. An institution must be able to justify that any excluded activities

or exposures, both individually and in combination, would not have a material impact on the overall risk estimates. An institution must have an appropriate *de minimis* gross loss threshold for internal loss data collection, for example $10,000. The appropriate threshold may vary somewhat between institutions, and within an institution across business lines and/or event types. However, particular thresholds should be broadly consistent with those used by peer institutions.

- Aside from information on gross loss amounts, an institution should collect information about the date of the event, any recoveries of gross loss amounts, as well as some descriptive information about the drivers or causes of the loss event. The level of detail of any descriptive information should be commensurate with the size of the gross loss amount.

- An institution must develop specific criteria for assigning loss data arising from an event in a centralized function (e.g. an information technology department) or an activity that spans more than one business line, as well as from related events over time.

- Operational risk losses that are related to credit risk and have historically been included in institutions' credit risk databases (e.g. collateral management failures) will continue to be treated as credit risk for the purposes of calculating minimum regulatory capital under this Framework. Therefore, such losses will not be subject to the operational risk capital charge. Nevertheless, for the purposes of internal operational risk management, institutions must identify all material operational risk losses consistent with the scope of the definition of operational risk and the loss event types outlined in the Authority's policy paper, 'The Management of Operational Risk' (May 2007), including those related to credit risk. Such material operational risk-related credit risk losses should be flagged separately within an institution's internal operational risk database. The materiality of these losses may vary between institutions, and within an institution across business lines and/or event types. Materiality thresholds should be broadly consistent with those used by peer institutions.

- Operational risk losses that are related to market risk are treated as operational risk for the purposes of calculating minimum regulatory capital and will therefore be subject to the operational risk capital charge.

External data

188. An institution's operational risk measurement system must use relevant external data (either public data and/or pooled industry data), especially when there is reason to believe that the institution is exposed to infrequent, yet potentially severe, losses. These external data should include data on actual loss amounts, information on the scale of business operations where the event occurred,

information on the causes and circumstances of the loss events, or other information that would help in assessing the relevance of the loss event for other institutions. An institution must have a systematic process for determining the situations for which external data must be used and the methodologies used to incorporate the data (e.g. scaling, qualitative adjustments, or informing the development of improved scenario analysis). The conditions and practices for external data use must be regularly reviewed, documented, and subject to periodic independent review.

Scenario analysis

189. An institution must use scenario analysis or expert opinion in conjunction with external data to evaluate its exposure to high-severity events. This approach draws on the knowledge of experienced business managers and risk management experts to derive reasoned assessments of plausible severe losses. For instance, these expert assessments could be expressed as parameters of an assumed statistical loss distribution. In addition, scenario analysis should be used to assess the impact of deviations from the correlation assumptions embedded in the institution's operational risk measurement framework, in particular, to evaluate potential losses arising from multiple simultaneous operational risk loss events. Over time, such assessments need to be validated and re-assessed through comparison to actual loss experience to ensure their reasonableness.

Business environment and internal control factors

190. In addition to using loss data, whether actual or scenario-based, an institution's firm-wide risk assessment methodology must capture key business environment and internal control factors that can change its operational risk profile. These factors will make an institution's risk assessments more forward-looking, more directly reflect the quality of the institution's control and operating environments, help align capital assessments with risk management objectives, and recognize both improvements and deterioration in operational risk profiles in a more immediate fashion. To qualify for regulatory capital purposes, the use of these factors in an institution's risk measurement framework must meet the following standards:

- The choice of each factor needs to be justified as a meaningful driver of risk, based on experience and involving the expert judgment of the affected business areas. Whenever possible, the factors should be translatable into quantitative measures that lend themselves to verification.

- The sensitivity of an institution's risk estimates to changes in the factors and the relative weighting of the various factors need to be well reasoned. In addition to capturing changes in risk due to improvements in risk controls, the framework must also capture potential increases in risk due to greater complexity of activities or increased business volume.

- The framework and each instance of its application, including the supporting rationale for any adjustments to empirical estimates, must be documented and subject to independent review within the institution as well as by the Authority.

- Over time, the process and the outcomes need to be validated through comparison to actual internal loss experience, relevant external data, and appropriate adjustments made.

(iv) Risk mitigation

191. Under the AMA, an institution is allowed to recognize the risk mitigating impact of insurance in the measures of operational risk used for regulatory minimum capital requirements. The recognition of insurance mitigation is limited to 20% of the total operational risk capital charge calculated under the AMA.

192. An institution's ability to take advantage of such risk mitigation will depend on compliance with the following criteria:

- The insurance provider has a minimum claims paying ability rating of A (or equivalent).

- The insurance policy must have an initial term of no less than one year. For policies with a residual term of less than one year, the institution must make appropriate haircuts reflecting the declining residual term of the policy, up to a full 100% haircut for policies with a residual term of 90 days or less.

- The insurance policy has a minimum notice period for cancellation of 90 days.

- The insurance policy has no exclusions or limitations triggered by supervisory actions or, in the case of a failed institution, that preclude the institution, receiver or liquidator from recovering for damages suffered or expenses incurred by the institution, except in respect of events occurring after the initiation of receivership or liquidation proceedings in respect of the institution, provided that the insurance policy may exclude any fine, penalty, or punitive damages resulting from supervisory actions.

- The risk mitigation calculations must reflect the institution's insurance coverage in a manner that is transparent in its relationship to, and consistent with, the actual likelihood and impact of loss used in the institution's overall determination of its operational risk capital.

- The insurance is provided by a third-party entity. In the case of insurance through captives and affiliates, the exposure has to be laid off to an independent third-

party entity, for example through re-insurance, that meets the eligibility criteria.

- The framework for recognizing insurance is well reasoned and documented.

- The institution discloses a description of its use of insurance for the purpose of mitigating operational risk.

193. An institution's methodology for recognizing insurance under the AMA also needs to capture the following elements through appropriate discounts or haircuts in the amount of insurance recognition:

- The residual term of a policy, where less than one year, as noted above;

- A policy's cancellation terms, where less than one year; and

- The uncertainty of payment as well as mismatches in coverage of insurance policies.

D. Partial use

194. An institution will be permitted to use an AMA for some parts of its operations and the Basic Indicator Approach or Standardized Approach for the balance (partial use), provided that the following conditions are met:

- All operational risks of the bank's global, consolidated operations are captured;

- All of the institution's operations that are covered by the AMA meet the qualitative criteria for using an AMA, while those parts of its operations that are using one of the simpler approaches meet the qualifying criteria for that approach;

- On the date of implementation of an AMA, a significant part of the institution's operational risks are captured by the AMA; and

- The institution provides the Authority with a plan specifying the timetable to which it intends to roll out the AMA across all but an immaterial part of its operations. The plan should be driven by the practicality and feasibility of moving to the AMA over time, and not for other reasons.

195. Subject to the approval of the Authority, an institution opting for partial use may determine which parts of its operations will use an AMA on the basis of business line, legal structure, geography, or other internally determined basis.

196. Subject to the approval of the Authority, where an institution intends to implement an approach other than the AMA on a global, consolidated basis and it does

not meet the third and/or fourth conditions in paragraph 194, above, the institution may, in limited circumstances:

- Implement an AMA on a permanent partial basis; and

- Include in its global, consolidated operational risk capital requirements the results of an AMA calculation at a subsidiary where the AMA has been approved by the relevant host supervisor and is acceptable to the bank's home supervisor.

197. The Authority is prepared to grant such approval only on an exceptional basis, in particular limited to circumstances in which an institution cannot meet the standard conditions as a result of implementation decisions taken by supervisors of overseas subsidiary operations.

D Market Risk

CALCULATION OF CAPITAL CHARGES IN RELATION TO MARKET RISKS

Introduction

198. The calculation of capital in respect of an institution's market risks involves an assessment of the different risks pertaining to trading book positions in interest-rate related instruments and in equities, together with foreign exchange and commodities' positions held throughout the institution's business. All transactions, including forward sales and purchases must be included in the assessment, as from the transaction date. Two broad methodologies may be applied. First, the so-called 'standardized' approach involves a building-block approach under which the different risk elements are separately calculated and summed arithmetically. The particular measurement frameworks for the calculations are set out in sub-sections a)-e) below. Alternatively, an 'internal models' approach may be applied, subject to the fulfillment of certain conditions detailed in sub-section f) below and subject in each case to the prior consent of the Authority.

199. In assessing required capital cover for the position risk on traded debt instruments or equities (or debt or equity derivatives), two separate components must be addressed: the general market risk component and the specific risk component. ***General*** risk is the risk of a price change in the instrument due (in the case of traded debt instruments or debt derivatives) to a change in the level of interest rates or (in the case of equities or equity derivatives) to a broad equity market movement unrelated to the specific attributes of individual securities. ***Specific*** risk components relate to the risk of a price change in the instrument concerned due to factors related to its issuer or, in the case of a derivative, to the issuer of the underlying instrument. The aggregate capital requirement for interest rate risk comprises the sum of the general market interest rate risk capital requirements across currencies and the specific risk capital requirements.

200. The excess of an institution's long (short) positions over its short (long) positions in the same equity, debt and convertible issues and in identical financial futures, options and warrants represents its net position in each of those different instruments. Instruments will be considered the same where the issuer is the same, they have equivalent ranking in a liquidation, and the currency, coupon and maturity are the same. Positions in derivative instruments are to be treated as positions in the underlying (or notional) security or securities. Netting is not permitted between a convertible instrument and an offsetting position in the instrument into which the security may be converted. Net positions are to be calculated separately for each currency in which they are denominated, with the capital requirement for general and specific risk calculated separately in each individual currency. Before aggregation, all net positions, irrespective of their signs, must be converted on a daily basis into the institution's reporting currency at the prevailing spot exchange rate.

201. In measuring the price risk on options under the standardized approach, a number of alternatives with varying degrees of sophistication are permitted. The greater the volume

of options written, the more sophisticated the measurement method needs to be. Where significant amounts of options are written, comprehensive value-at-risk models, consistent with the criteria set out in sub-section f) must be used.

202. Internal models frequently seek to calculate institutions' general market risk, leaving specific risk (i.e. exposures to specific issuers of equity or debt securities) to be measured through separate credit risk measurement systems. Where models do not capture specific risk, a separate capital charge for that element must be calculated and applied.

203. In managing their market risks, institutions must be able to monitor their positions on a continuous basis and, in particular, to determine at the close of each trading day that they remain in compliance with stipulated capital requirements. Where the Authority has concerns that the market risk positions recorded as at normal end-quarter reporting dates may differ materially from levels incurred at other times, it is likely to impose additional reporting requirements in order to avoid any risk of 'window-dressing'. Institutions must also have effective risk management systems in place enabling them to track exposures on an intra-day basis to ensure that exposures are not excessive at any time, and are consistent with agreed limits. Where any breach of capital requirements is identified, this must be reported forthwith to the Authority, together with an explanation of the reasons for the breach and of the steps taken to restore compliance.

Treatment of Counterparty Credit Risk in the Trading Book

204. Institutions are required to calculate their counterparty credit risk charge for OTC derivatives, repo-style and similar transactions booked in the trading book, separate from the capital charge for general market risk and specific risk. The risk weights to be used must be consistent with those used for calculating the capital requirements in the banking book. Thus, institutions using the standardized approach in the banking book must use standardized approach risk weights in the trading book, and institutions moving to adopt IRB approaches will be required to use IRB weights in the trading book.

205. In the trading book, in the case of repo-style transactions, all instruments included in the trading book may be used as eligible collateral. Those instruments that fall outside the banking book definition of eligible collateral are subject to a haircut at the level applicable to non-main index equities listed on recognized exchanges (as set out in paragraph 12 of Annex 2.8). However, where institutions are using the own estimates approach to haircutting, they may also apply it in the trading book in accordance with paragraphs 15 and 16 of Annex 2.8. Consequently, for instruments that count as eligible collateral in the trading book, but not in the banking book, the haircuts must be calculated for each individual security. Where institutions are using a VaR approach to measuring exposure for repo-style transactions, they may also apply this approach in the trading book in accordance with paragraphs 37 to 40 of Annex 2.8, as well as with Annex 2.3.

206. The calculation of the counterparty credit risk charge for collateralized OTC derivative transactions is in accordance with the rules set out for such transactions in the banking book. The counterparty risk charge for repo-style transactions follows the rules set out in paragraphs 8 to 40 of Annex 2.8, as well as in Annex 2.3 with regard to banking book transactions.

Credit Derivatives

207. The counterparty credit risk charge for single name credit derivative transactions in the trading book is calculated using the following potential future exposure add-on factors:

Total Return Swap	**Protection Buyer**	**Protection Buyer**
"qualifying" reference obligation	5%	5%
"non-qualifying" reference obligation	10%	10%
Credit Default Swap		
"qualifying reference obligation 5% 5%*	5%	5%*
"non-qualifying" reference obligation	10%	10%*

There is no difference based on residual maturity. The definition of "qualifying" reflects that of the "qualifying" category for the treatment of specific risk in sub-section a) below.

*The protection seller of a credit default swap is only subject to the add-on factor where the transaction is subject to closeout on the insolvency of the protection buyer while the underlying remains solvent. The add-on should then be capped at the amount of unpaid premiums.

208. Where the credit derivative is a first to default transaction, the add-on is determined by the lowest credit quality underlying in the basket, i.e. if there are any non-qualifying items in the basket, the non-qualifying reference obligation add-on is to be used. For second and subsequent to default transactions, underlying assets should continue to be

allocated according to the credit quality, i.e. the second lowest credit quality will determine the add-on for a second to default transaction.

The Capital Requirement

209. The definition of capital that is used for market risk purposes is set out in paragraphs 20 and 21 of Part 2 of this paper. In calculating eligible capital, it is necessary first to calculate the institution's minimum capital requirement for credit and operational risks, and only afterwards its market risk capital requirement, to establish how much Tier 1 and Tier 2 capital is available to support market risk. Eligible capital is the sum of the whole of the institution's Tier 1 capital, plus all of its Tier 2 capital, subject to the limits imposed by paragraph 10 of Part 2. Tier 3 capital is regarded as eligible only if it can be used to support market risks under the conditions set out in paragraphs 20 and 21 of Part 2. The quoted capital ratio thus represents capital that is available to meet credit risk, operational risk, and market risk. Where an institution has Tier 3 capital, within the limits stipulated in paragraph 20 of Part 2, which is not currently supporting market risks, it may report that excess as unused but eligible Tier 3, alongside its standard ratio.

Market Risk – Standardized Measurement Method

a) Interest Rate Risk

210. The following paragraphs set out the framework for measuring the risk of holding or taking positions in debt securities and other interest rate related instruments in the trading book. The instruments covered include all fixed-rate and floating-rate debt securities and instruments that behave like them, including non-convertible preference shares. Convertible bonds, i.e. debt issues or preference shares that are convertible, at a stated price, into common shares of the issuer, should be treated as debt securities if they trade like debt securities and as equities if they trade like equities. The basis for dealing with derivative products is set out later in this sub-section.

211 The minimum capital requirement is expressed in terms of two separately calculated charges, one applying to the 'specific risk' of each security, whether it is a long or a short position, and the other to the interest rate risk in the portfolio (termed 'general market risk') where long and short positions in different securities or instruments can be offset.

I - Specific Risk

212. The capital charge for specific risk is designed to provide cover against an adverse movement in the price of an individual security, reflecting factors specific to the issuer. In measuring specific risk, offsetting is restricted to matched positions in the identical issue (including positions in derivatives). Even where the issuer is the same, no offsetting is permitted between different issues since differences in coupon rates, liquidity, call features etc mean that prices may diverge in the short run.

213. Capital charges for 'government', 'qualifying' and 'other' categories are as shown below:

Categories External Credit	External Credit Assessment	Specific risk capital charge
Government	AAA to AA-	0%
	A+ to BBB-	0.25%(residual term to maturity 6 months or less) 1% (residual term to maturity greater than 6 and up to/including 24 months) 1.6%(residual term to final maturity exceeding 24 months)
	BB+ to B-	8%
	Below B-	12%
	Unrated	8%
Qualifying		0.25% (residual term to final maturity 6 months or less) 1% (residual term to final maturity greater than 6 and up to and including 24 months) 1.6% (residual term to final maturity exceeding 24 months)
Other	BB+ to BB-	8%
	Below BB-	12%
	Unrated	8%

214. The category 'government' includes all forms of government paper (interpreted to include local or regional government subject to a zero credit risk weight within this framework), including bonds, Treasury bills and other short-term instruments. However, the Authority reserves the right to apply a specific risk weight to securities

issued by particular foreign governments where securities are denominated in a currency other than that of the issuing government. The Authority does not intend, at least for the time being, to provide for a lower specific risk charge where government paper is denominated in the domestic currency and funded by the institution in the same currency.

215. The 'qualifying' category includes securities issued by public sector entities and MDBs, together with other securities that are:

- rated investment grade (e.g. Baa or higher by Moody's and BBB or higher by Standard and Poor's) by at least two credit rating agencies specified by the Authority; or
- rated investment grade by one rating agency and not less than investment grade by any other rating agency specified by the Authority; or
- subject to supervisory approval, unrated, but deemed to be of comparable investment quality by the reporting institution, **and** the issuer has securities listed on a recognized stock exchange.

The Authority monitors closely the application of the qualifying criteria, notably with regard to the third category listed above. The Authority may be prepared at a later stage to extend qualifying category status to debt securities issued by banks and other regulated financial institutions in jurisdictions which have applied fully the Basel 2 framework to those institutions.

Specific risk rules for unrated debt securities

216. Where institutions use the IRB approach for a portfolio, unrated securities can be included in the 'qualifying' category if both the following conditions are met:

- the securities are rated equivalent[6] to investment grade in the institution's internal rating system which has been confirmed compliant with the requirements for an IRB approach; and
- the issuer has securities listed on a recognized stock exchange.

Specific rules for non-qualifying issuers

217. Instruments issued by a non-qualifying issuer receive the same specific risk charge as a non-investment grade corporate borrower under the standardized approach for credit risk in this framework.

218. However, this treatment may in certain cases considerably underestimate the

[6] Equivalent means that the debt security has a one-year PD equal to or less than the one year PD implied by the long-run average one-year PD of a security rated investment grade or better by a qualifying rating agency.

specific risk for debt instruments which have a high yield to redemption relative to government debt securities. Where concerns arise, the Authority may opt to apply a higher specific risk charge in such cases and/or disallow offsetting for the purposes of defining the extent of general market risk between such instruments and any other debt instruments. In that respect, securitization exposures that are subject to a deduction treatment under the securitization framework (e.g. equity tranches that absorb first loss), as well as securitization exposures that are unrated liquidity lines or letters of credit suffer a capital charge that is no less than the charge applying under the securitization rules.

Specific risk capital charges for positions hedged by credit derivatives

219 Full recognition is given where the values of the two legs (i.e. the long and the short) always move in opposite directions and broadly to the same extent. This is the case where:

- 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). [However, the maturity of the swap itself may be different from that of the underlying exposure.]

In these cases, no specific risk capital requirement applies to both sides of the position.

220. An 80% offset can be recognized where the value of the two legs (the long and the short) always move in opposite directions but not broadly to the same extent. This would be the case where a long cash position is hedged by a credit default swap or a credit linked note (or vice versa) and there is an exact match in terms of the reference obligation, the maturity of both the reference obligation and the credit derivative, and the currency of the underlying exposure. In addition, key features of the credit derivative contract (e.g. credit event definitions, settlement mechanisms) should not cause the price movement of the credit derivative to deviate materially from the price movements of the cash position. To the extent that the transaction transfers risk (i.e. taking account of restrictive payout provisions such as fixed payouts and materiality thresholds), an 80% specific risk offset may be applied to the side of the transaction with the higher capital charge, while the specific risk requirement on the other side will be zero.

221. Partial allowance can be recognized where the value of the two legs (the long and the short) usually moves in opposite directions. This would be the case in the following situations:

- the position is captured under the second tier of paragraph 219 above, but there is an asset mismatch between the reference

obligation and the underlying exposure. The requirement of paragraph 2g) of Annex 2.10 must also be met;

- the position is captured by the first tier of paragraph 219 above or by paragraph 220, but there is a currency or maturity mismatch between the credit protection and the underlying asset;
- the position is captured by paragraph 220 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.

222. In all the cases covered by paragraphs 219 to 221 above, it is not necessary to include specific risk capital requirements for each side of the transaction (i.e. the credit protection and the underlying asset). Only the higher of the two capital requirements applies. However, in all cases not covered by paragraphs 219 to 221 above, a specific risk capital charge must be assessed against each side of the position.

223. As regards first-to-default and second-to-default products in the trading book, the basic concepts developed for the banking book also apply. Institutions holding long positions in these products (e.g. buyers of basket credit linked notes) are treated as if they were protection sellers and are required to add the specific risk charges or use the external rating, if available. Issuers of these notes are treated as if they were protection buyers and are therefore allowed to offset specific risk for one of the underlyings - i.e. the asset with the lowest specific risk charge.

II - General Market Risk

224. Capital requirements for general market risk are designed to capture the risk of loss from changes in market interest rates – i.e. the risk of either parallel or non-parallel shifts in the yield curve. A choice between two principal methods of measuring general market risk is permitted – a 'maturity' method and a 'duration' method'. Institutions must opt for one method and may not make use of a combination of the two methods. In each case, the capital charge is the sum of four components:

a) the net long or short position in the whole trading book
b) a small proportion of the matched positions in each time-band (the 'vertical disallowance')
c) a larger proportion of the matched positions across different time-bands (the 'horizontal disallowance') and
d) a net charge for positions in options, where appropriate.

225. Separate maturity ladders must be used for each currency, with capital charges being calculated for each currency separately and then summed with no offsetting between positions of opposite sign. However, where an institution holds positions in a variety of currencies but where the volume and value are insignificant, the Authority

permits aggregate reporting within a single maturity ladder, with the net long or short position for each currency slotted into the time-bands appropriately. These individual net positions must be summed within each time-band, irrespective of whether they are long or short, to produce a gross position figure.

Maturity method

226. Individual long or short positions in debt securities and other sources of interest rate exposures including derivative instruments, are slotted into a maturity ladder comprising thirteen time-bands (or fifteen time-bands in the case of low coupon instruments). Fixed rate instruments are allocated according to the residual term to maturity, and floating-rate instruments according to the residual term to the next repricing date. Opposite positions of the same amount in the same issues (but not different issues by the same issuer), whether actual or notional, can be omitted from the interest rate maturity framework, as well as closely matched swaps, forwards, futures and FRAs which meet the conditions set out in paragraphs 237 and 238, below.

227. The first step in the calculation is to weight the positions in each time-band by a factor designed to reflect the price sensitivity of those positions to assumed changes in interest rates. The weights for each time-band are set out in the table below. Zero-coupon bonds and deep-discount bonds (defined as bonds with a coupon of less than 3%) should be slotted according to the time-bands set out in the second column of the table.

Maturity method: time-bands and risk weights

Assumed changes in yield	Coupon > 3%	Coupon < 3%	Risk weight
1.00	1 month or less	1 month or less	0.00%
1.00	1 to 3 months	1 to 3 months	0.20%
1.00	3 to 6 months	3 to 6 months	0.40%
1.00	6 to 12 months	6 to 12 months	0.70%
0.90	1 to 2 years	1 to 1.9 years	1.25%
0.80	2 to 3 years	1.9 to 2.8 years	1.75%
0.75	3 to 4 years	2.8 to 3.6 years	2.25%
0.75	4 to 5 years	3.6 to 4.3 years	2.75%
0.70	5 to 7 years	4.3 to 5.7 years	3.25%
0.65	7 to 10 years	5.7 to 7.3 years	3.75%
0.60	10 to 15 years	7.3 to 9.3 years	4.50%
0.60	15 to 20 years	9.3 to 10.6 years	5.25%
0.60	> 20 years	10.6 to 12 years	6.00%
0.60		12 to 20 years	8.00%
0.60		> 20 years	12.50%

228. The next step in the calculation is to offset the weighted longs and shorts in each time-band, resulting in a single short or long position for each band. Since, however, each band can include different instruments and different maturities, a 10% capital charge to reflect basis risk and gap risk is levied on the smaller of the offsetting positions, whether short or long. Thus, if the sum of the weighted longs in a timeband is $100 million and the sum of the weighted shorts $90 million, the so-called 'vertical disallowance' for that time-band is 10% of $90 million (i.e. $9 million).

229. The result of the above calculations is to produce two sets of weighted positions, the net long or short positions in each time-band ($10 million long in the example above), and the vertical disallowances, which have no sign. In addition, however, institutions are permitted to conduct two rounds of 'horizontal offsetting', first between the net positions in each of three zones: zero to 1 year, 1-4 years, and 4 years and over; and subsequently between the net positions in the three different zones. (For coupons less than 3%, the zones are 0-1 year, 1 to 3.6 years, and 3.6 years and over.) The offsetting is subject to a scale of disallowances expressed as a fraction of the matched positions, as set out in the table below. The weighted long and short positions in each of the three zones may be offset, subject to the matched position attracting a disallowance factor that is part of the capital charge. The residual net position in each zone may be carried over and offset against opposite positions in other zones, subject to a second set of disallowance factors.

Horizontal disallowances

<table>
<tr><th>Zones*</th><th>Time-band</th><th>Within the zone</th><th>Between adjacent zones</th><th>Between zones 1 and 3</th></tr>
<tr><td rowspan="4">Zone 1</td><td>0-1 month</td><td rowspan="4">40%</td><td rowspan="8"></td><td rowspan="12"></td></tr>
<tr><td>1-3 months</td></tr>
<tr><td>3-6 months</td></tr>
<tr><td>6-12 months</td></tr>
<tr><td rowspan="4">Zone 2</td><td>1-2 years</td><td rowspan="4">30%</td></tr>
<tr><td>2-3 years</td></tr>
<tr><td>3-4 years</td></tr>
<tr><td>4-5 years</td></tr>
<tr><td rowspan="5">Zone 3</td><td>5-7 years</td><td rowspan="5">30%</td><td rowspan="5">40%</td></tr>
<tr><td>7-10 years</td></tr>
<tr><td>10-15 years</td></tr>
<tr><td>15-20 years</td></tr>
<tr><td>Over 20 years</td></tr>
</table>

* For coupons less than 3%, the zones are 0-1 year, 1 –3.6 years and 3.6 years and over.

230. An example of the calculation of the capital requirement under this method is given in the table overleaf

WORKED EXAMPLE OF MATURITY METHOD OF CALCULATING GENERAL INTEREST RATE RISK

Zone	Maturity Band		Individual Net Positions		Weighting Factor	Weighted net Positions		By Band		By Zone		Between Zones	Between Zones
A	B Coupon =/> 3 %	C Coupon <3 %	D Long	E Short	F	G (D x F) Long	H (E x F) Short	I Matched	J Unmatched	K Matched	L Unmatched	M Matched	N Matched
1	1 month or less	1 month or less	$100	($50)	0.00%	$0.00	$0.00	$0.00	$0.00	$0.00	$1.30		
	1 to 3 months	1 to 3 months	$200	($100)	0.20%	$0.40	($0.20)	$0.20	$0.20	(T)			
	3 to 6 months	3 to 6 months	$300	($200)	0.40%	$1.20	($0.80)	$0.80	$0.40				
	6 to 12 months	6 to 12 months	$400	($300)	0.70%	$2.80	($2.10)	$2.10	$0.70			Zones 1 & 2	
2	1 to 2 years	1 to 1.9 years	$100	($200)	1.20%	$1.20	($2.40)	$1.20	($1.20)	$0.00	($5.20)	$1.30	
	2 to 3 years	1.9 to 2.8 years	$200	($300)	1.75%	$3.50	($5.25)	$3.50	($1.75)	(U)		(W)	Zones 1 & 3
	3 to 4 years	2.8 to 3.6 years	$300	($400)	2.25%	$6.75	($9.00)	$6.75	($2.25)			Zones 2 & 3	$0.00
3	4 to 5 years	3.6 to 4.3 years	$100	($100)	2.75%	$2.75	($2.75)	$2.75	$0.00	$4.50	$8.25	$3.90	(Z)
	5 to 7 years	4.3 to 5.7 years	$200	($200)	3.25%	$6.50	($6.50)	$6.50	$0.00	(V)		(X)	
	7 to 10 years	5.7 to 7.3 years	$300	($100)	3.75%	$11.25	($3.75)	$3.75	$7.50				
	10 to 15 years	7.3 to 9.3 years	$100	($200)	4.50%	$4.50	($9.00)	$4.50	($4.50)				
	15 to 20 years	9.3 to 10.6 years	$200	($100)	5.25%	$10.50	($5.25)	$5.25	$5.25				
	Over 20 years	10.6 to 12 years	$300	($300)	6.00%	$18.00	($18.00)	$18.00	$0.00				
		12 to 20 years	$0	$0	8.00%	$0.00	$0.00	$0.00	$0.00				
		Over 20 years	$0	$0	12.50%	$0.00	$0.00	$0.00	$0.00				
Total of Columns			$2,800	($2,550)				$55.30			$4.35		
								(S)			(Y)		
General Interest Rate Risk Capital Requirement								$5.53		$1.35	$4.35	$2.08	

Total General Interest Rate Risk Capital Requirement = 10%S + 40%T + 30%(U+V) + 40%(W+X) + 100%Y + 100%Z = $13.31

Note: For Instruments the maturity of which is on the boundary of two maturity bands, the instrument should be placed into the earlier maturity band. For example, instruments with a maturity of exactly one year are placed into the 6 to 12 months band.

Duration method

231. Where the Authority is satisfied that institutions have the necessary capability, they are encouraged to use the duration method, as providing a more accurate measure of their general market risk, by calculating the price sensitivity of each position separately. Institutions must elect and use their chosen method on a continuous basis (unless a change in method is approved by the Authority). Calculation systems are subject to monitoring by the Authority. The mechanics of the duration method are as follows:

First, calculate the price sensitivity of each instrument in terms of a change in interest rates of between 0.6 and 1.0 percentage points, depending on the maturity of the instrument (see table below);

Slot the resulting sensitivity measures into a duration-based ladder with the fifteen time-bands set out in the table below;

Subject long and short positions in each time-band to a 5% vertical disallowance designed to capture basis risk;

Carry forward the net positions in each time-band for horizontal offsetting subject to the disallowances set out in the table following paragraph 229 above.

Duration method: time-bands and assumed changes in yield

	Assumed change in yield (%)		**Assumed change in yield (%)**
Zone 1		**Zone 3**	
1 month or less	1.00	3.6 to 4.3 years	0.75
1 to 3 months	1.00	4.3 to 5.7 years	0.70
3 to 6 months	1.00	5.7 to 7.3 years	0.65
6 to 12 months	1.00	7.3 to 9.3 years	0.60
Zone 2		9.3 to 10.6 years	0.60
1.0 to 1.9 years	0.90	10.6 to 12 years	0.60
1.9 to 2.8 years	0.80	12 to 20 years	0.60
2.8 to 3.6 years	0.75	over 20 years	0.60

232 In the case of positions in insignificant currencies for which separate ladders have not been constructed, the gross positions in each time-band are subject to either the risk weighting set out in the table following paragraph 227 above (where the maturity method is used), or the assumed change in yield set out in the table following paragraph 231 above (where the duration method is used), with no further offsets.

Interest rate derivatives

233. Institutions' measurement systems must include all interest rate derivatives and off-balance sheet instruments in the trading book which react to changes in interest rates (e.g. forward rate agreements, (FRAs), other forward contracts, bond futures, interest rate and cross-currency swaps and forward foreign exchange positions). Options can be treated in a variety of ways (see sub-section e) below). A summary of the rules for dealing with interest rate derivatives is given in the table following paragraph 241**,** below.

Calculation of positions

234. The derivatives are converted into positions in the relevant underlying and become subject to specific and general market risk charges as described above. In order to calculate the standard formula, the amounts reported should be the market value of the principal amount of the underlying or of the notional underlying resulting from the prudent valuation guidance set out in paragraphs 16 and 17 of Annex 2.1. For instruments where the apparent notional amount differs from the effective notional amount, institutions must use the effective notional amount.

Futures and forward contracts, including forward rate agreements

235. These instruments are treated as a combination of a long and a short position in a notional government security. The maturity of a future or a FRA will be the period until delivery or exercise of the contract, plus – where applicable – the life of the underlying instrument. For example, a long position in a June three month interest rate future (taken in April) is to be reported as a long position in a government security with a maturity of five months and a short position in a government security with a maturity of two months. Where a range of deliverable instruments may be delivered to fulfill the contract, a reporting institution has flexibility to elect which deliverable security should go into the maturity or duration ladder, but it must take account of any conversion factor defined by the exchange. In the case of a future on a corporate bond index, positions are to be included at the market value of the notional underlying portfolio of securities.

Swaps

236. Swaps are treated as two notional positions in government securities with relevant maturities. For example, an interest rate swap under which an institution is receiving floating rate interest and paying fixed will be treated as a long position in a floating rate instrument of maturity equivalent to the period until the next interest fixing and a short

position in a fixed-rate instrument of maturity equivalent to the residual life of the swap. For swaps that pay or receive a fixed or floating interest rate against some other reference price, e.g. a stock index, the interest rate component should be slotted into the appropriate repricing maturity category, with the equity component being included in the equity framework. The separate legs of cross-currency swaps are to be reported in the relevant maturity ladders for the currencies concerned.

Calculation of capital charges for derivatives in the standardized methodology

Allowable offsetting of matched positions

237. Institutions may exclude altogether from the interest rate maturity framework (for both specific and general market risk) long and short positions (both actual and notional) in identical instruments with exactly the same issuer, coupon, currency and maturity. A matched position in a future or forward and its corresponding underlying may also be fully offset, and thus excluded from the calculation. (However, in this case, the leg representing the time to expiry of the future should be reported.) When the future or the forward comprises a range of deliverable instruments, offsetting of positions in the future and forward contract and its underlying is only permissible in cases where there is a readily identifiable underlying security which is the most profitable for the trader to deliver. The price of this security, sometimes called the 'cheapest-to-deliver', and the price of the future or forward contract should in such cases move in close alignment. No offsetting is allowed between positions in different currencies; the separate legs of cross-currency swaps or forward foreign exchange deals are to be treated as notional positions in the relevant instruments and included in the appropriate calculation for each currency.

238. In addition, opposite positions in the same category of instruments can in certain circumstances be regarded as matched and allowed to offset fully. (This would include the delta-equivalent value of options: the delta equivalent of the legs arising out of the treatment of caps and floors can also be offset against each other in accordance with the provisions of this paragraph.) To qualify for this treatment the positions must relate to the same underlying instruments, be of the same nominal value and be denominated in the same currency. (The separate legs of different swaps may also be 'matched' subject to the same conditions.) In addition:

- **for futures**: offsetting positions in the notional or underlying instruments to which the futures contract relates must be for identical products and must mature within several days of each other;
- **for swaps and FRAs**: the reference rate (for floating rate positions) must be identical and the coupon closely matched (i.e. within 15 basis points);
- **for swaps, FRAs and forwards**: the next interest fixing date or, for fixed coupon positions or forwards, the residual maturity must correspond within the following limits:
    - ~ less than one month hence: same day
    - ~ between one month and one year hence: within 7 days

~ over one year hence: within 30 days.

239. Institutions with large swap books may use alternative formulae for these swaps to calculate the positions to be included in the maturity or duration ladder. One method would be to first convert the payments required by the swap into their present values. For that purpose, each payment must then be discounted using zero coupon yields, and a single net figure for the present value of the cash flows entered into the appropriate time-band using procedures that apply to zero (or low) coupon bonds; these figures should be slotted into the general market risk framework as set out above. An alternative method would be to calculate the sensitivity of the net present value implied by the change in yield used in the maturity or duration method and allocate these sensitivities into the time-bands set out in the tables following paragraph 227 or paragraph 231 above, as appropriate. Other methods which produce similar results could also be used. However, such alternative treatments may only be used where:

- the Authority is satisfied with the accuracy of the systems being used;
- the positions calculated fully reflect the sensitivity of the cash flows to interest rate changes and are entered into the appropriate time-bands;
- the positions are denominated in the same currency.

Specific risk

240. Interest rate and currency swaps, FRAs, forward foreign exchange contracts and interest rate futures are not subject to a specific risk charge. This exemption also applies to futures on an interest rate index (e.g. LIBOR). However, in the case of futures contracts where the underlying is a debt security, or an index representing a basket of debt securities, a specific risk charge applies according to the credit risk of the issue as set out in paragraphs 212 to 223 above.

General market risk

241. General market risk applies to positions in all derivative products in the same manner as for cash positions, subject only to an exemption for fully or very closely matched positions in identical instruments (as per paragraphs 237 and 238 above). The various categories of instruments should be slotted into the maturity ladder according to the rules set out earlier. The following table provides an overall summary of the regulatory treatment of interest rate derivatives for market risk purposes.

Summary of treatment of interest rate derivatives

Instrument	Specific risk charge*	General market risk charge
Exchange-traded future		
- govt debt security	Yes**	Yes, as two positions
-corp debt security	Yes	Yes, as two positions
-index in interest rates	No	Yes, as two positions
OTC forward		
- govt debt security	Yes**	Yes, as two positions
- corp debt security	Yes	Yes, as two positions
- index on interest rates	No	Yes, as two positions
FRAs, Swaps	No	Yes, as two positions
Forward foreign exchange	No	Yes, as 1 position in each cy
Options		
-govt. debt security	Yes**	Either: (a) carve out with associated hedging positions i. simplified approach ii. scenario analysis iii. internal models (b) General market risk charge according to delta-plus method (gamma and vega to receive separate capital charges)
-corp. debt security	Yes	
-index on interest rates	No	
-FRAs, Swaps	No	

* This is the specific risk charge relating to the issuer of the instrument. Under existing rules for credit risk, there is a separate capital charge for counterparty risk.

** The specific risk capital charge applies only to government securities that are rated below AA-.

b) Equity position risk

242. This sub-section sets out the minimum capital standard to cover the risk of holding or taking positions in equities in the trading book. It applies to long and short positions in all instruments that exhibit market behaviour similar to equities, but not to non-convertible preference shares (which are covered by the interest rate risk requirements above). Long and short positions in the same issue may be reported on a net basis. Instruments covered include common stocks, whether voting or non-voting, convertible securities that behave like equities, and commitment to buy or sell equity securities. The treatment of derivative products, stock indices and index arbitrage is set out later in this section.

Specific and general market risk

243. As with interest rate related instruments, the minimum capital requirement for equities is expressed as the sum of two separately calculated charges, one applying to the specific risk of holding a long or short position in an individual equity, and the other to the general market risk of holding a long or short position in the market as a whole. Specific risk is defined as the institution's gross equity positions (i.e. the sum of all long equity positions and of all short equity positions) and the general market risk as the difference between the sum of the longs and the sum of the shorts (i.e. the overall net position in an equity market). The long or short position in the market must be calculated on a market by market basis i.e. a separate calculation has to be carried out for each national market in which the institution holds equities.

244. The capital charge for specific risk is 8%, unless the portfolio is both liquid and well-diversified, in which case a charge of 4% applies. The Authority will determine and publish the criteria for liquid and well diversified portfolios. The general market risk charge is 8%.

Equity derivatives

243. Except for options (see separate sub-section below), equity derivatives and off-balance sheet positions which are affected by changes in equity prices are to be included in the measurement system[1]. This includes futures and swap on both individual equities and on stock indices. The derivatives are to be converted into positions in the relevant underlying. The treatment of equity derivatives is summarized in the table following paragraph 252, below.

[1] Where equities are part of a forward contract, a future or an option (quantity of equities to be received or to be delivered), any interest rate or foreign currency exposure from the other leg of the contract should be reported as set out in paragraphs 210 to 241 and 253) to 263.

Calculation of positions

246. In order to calculate the standard formula for specific and general market risk, positions in derivatives must be converted into notional equity positions:

- futures and forward contracts relating to individual equities should in principle be reported at current market prices;

- futures relating to stock indices should be reported as the marked-to-market value of the notional underlying equity portfolio:

- equity swaps are to be treated as two notional positions. For example, an equity swap in which an institution is receiving an amount based on the change in value of one particular equity or stock index and paying a different index will be treated as a long position in the former and a short position in the latter. Where one of the legs involves receiving/paying a fixed or floating interest rate, that exposure should be slotted into the appropriate repricing time-band for interest rate related instruments as described in the standardized approach for interest rate risk;

- equity options and stock index options should be either 'carved out' together with the associated underlyings or be incorporated in the measure of general market risk described in this section, according to the delta-plus method.

Calculation of capital charges

Measurement of specific and general market risk

247. Matched positions in each identical equity or stock index in each market may be fully offset, resulting in a single net short or long position to which the specific and general market risk charges apply. For example, a future in a given equity may be offset against an opposite cash position in the same equity. (The interest rate risk arising out of the future, however, should be reported in accordance with the provisions for the standardized approach to interest rate risk, above).

Risk in relation to an index

248. Besides general market risk, a further capital charge of 2% applies to the net long or short position in an index contract comprising a diversified portfolio of equities. This capital charge is intended to cover factors such as execution risk. The Authority reviews the content of such portfolios to satisfy itself that only well-diversified indices benefit from the 2% charge, and not, for example, a sectoral index.

Arbitrage

249. In the case of the futures related arbitrage strategies described below, the additional 2% capital charge described above may be applied to only one index, with the opposite position exempt from a capital charge. The strategies are:

- when the institution takes an opposite position in exactly the same index at different dates or in different centres;
- when the institution has an opposite position in contracts at the same date in different but similar indices, provided the Authority is satisfied that the two indices contain sufficient common components to justify offsetting.

250. When an institution engages in a deliberate arbitrage strategy in which a futures contract on a broadly-based index matches a basket of stocks, it is allowed to carve out both positions from the standardized methodology on condition that:

- the trade has been deliberately entered into and is separately controlled;
- the composition of the basket of stocks represents at least 90% of the index when broken down into its notional components.

In such a case, the minimum capital requirement is 4% (i.e. 2% of the gross value of the positions on each side) to reflect divergence and execution risks. This applies even if all the stocks comprising the index are held in identical proportions. Any excess value of the stocks comprising the basket over the value of the futures contract or excess value of the futures contract over the value of the basket is to be treated as an open long or short position.

251. Where an institution takes a position in depository receipts against an opposite position in the underlying equity or identical equities in different markets, it may offset the position (i.e. bear no capital charge) but only on condition that any costs of conversion are fully taken into account. (Any resulting foreign exchange risk must be reported according to the provisions set out in the sub-section on Foreign Exchange Risk, below.)

252. The table below summarizes the regulatory treatment of equity derivatives for market risk purposes:

Summary of treatment of equity derivatives

Instrument	Specific risk*	General market risk
Exchange-traded Or OTC future		
- individual equity	Yes	Yes, as underlying
- index	2%	Yes, as underlying
Options		
- individual equity	Yes	Either (a) Carve out together with the associated hedging positions -simplified approach -scenario analysis -internal models (b) General market risk charge according to the delta-plus method(gamma and vega should receive separate capital charges)
- Index	2%	

* This is the specific risk charge relating to the issuer of the instrument. Under existing credit risk rules, a separate capital charge for counterparty risk also applies.

c) Foreign Exchange Risk

253. This sub-section sets out the minimum capital standard to cover the risk of holding or taking positions in foreign currencies, including gold. Gold is dealt with as a foreign exchange position rather than as a commodity because its volatility is more in line with foreign currencies, and institutions manage their positions in a similar manner to foreign currencies.

254. Two processes are involved in calculating the capital position for foreign exchange risk. The first involves measuring the exposure in a single currency position; and the second is to measure the risks inherent in an institution's mix of long and short positions in different currencies.

Measuring the exposure in a single currency

255. The net open position in each currency should be calculated by summing:

- the net spot position (i.e. all asset items less all liability items, including accrued interest, denominated in the currency in question);
- the net forward position (i.e. all amounts to be received less all amounts to be paid under forward foreign exchange transactions, including currency futures and the principal on currency swaps not included in the spot position);
- guarantees (and similar instruments) that are certain to be called and are likely to be irrecoverable;
- net future income/expenses not yet accrued but already fully hedged (at the discretion of the reporting institution);
- depending on particular accounting conventions, any other item representing a profit or loss in foreign currencies;
- the net delta-based equivalent of the total book of foreign currency options (subject to a separate capital charge for gamma and vega, unless an alternative methodology is applied)

256. Positions in composite currencies need to be reported separately. However, for the measurement of open positions, they may either be treated as a currency in their own right or split into their component parts on a consistent basis. Positions in gold should be measured in the same manner, having been converted into national currency at current spot rates. (Where gold is part of a forward contract –quantity of gold to be received or delivered – any interest rate risk or foreign currency exposure from the other leg of the contract should be reported as set out in the standardized approach for interest rate risk.)

Treatment of interest, other income and expenses

257. Interest accrued (i.e. earned but not yet received) should be included as a position. Accrued expenses should also be included. Unearned but expected future interest and anticipated expenses may be excluded unless the amounts are certain and institutions have taken the opportunity to hedge them. Where future income/expenses are included, this must be done on a consistent basis, and institutions may not select only those future flows which reduce their position.

The measurement of forward currency and gold positions

258. Forward currency and gold positions are normally to be valued at current spot market exchange rates. Using forward exchange rates would be inappropriate since it would result in the measured positions reflecting current interest rate differentials to some extent. However, institutions which base their normal management accounting on net present values are expected to use the net present values of each position, discounted using current exchange rates and valued at current spot rates, for measuring their forward currency and gold positions.

The treatment of structural positions

259. A matched currency position protects an institution against loss from movements in exchange rates, but will not necessarily protect its capital adequacy ratio. Where an institution has its capital denominated in its domestic currency and has a portfolio of foreign currency assets and liabilities that is completely matched, its capital/asset ratio will fall if the domestic currency depreciates. By running a short position in its domestic currency the institution can protect its capital adequacy ratio, although a loss would result if the domestic currency were to appreciate.

260. The Authority permits institutions to protect their capital adequacy in this way. Any positions taken with the deliberate intention of hedging partially or totally against the adverse effect of the exchange rate on an institution's capital ratio may be excluded from the calculation of net open currency positions, provided the following conditions are met:
- positions need to be of a 'structural' i.e. non-dealing nature, consistent with the definition applied by the Authority;
- the Authority needs to be satisfied in each case that the structural position that is excluded does no more than protect the institution's capital adequacy ratio;
- the exclusion needs to be treated consistently, with the treatment of the hedge remaining the same throughout the life of the assets or other items.

261. No capital charge is applied to positions related to items that are deducted from an institution's capital when calculating its capital base e.g. investments in non-consolidated

subsidiaries, or to other long term participations denominated in foreign currencies which are reported in the published accounts at historic cost.

Measuring the foreign exchange risk in a portfolio of foreign currency positions and gold

262. Institutions may choose between two alternative measures: a 'shorthand' method which treats all currencies equally; and the use of internal models which take account of the actual degree of risk having regard to the composition of the institution's portfolio. The conditions for the use of internal models set out in sub-section f) apply.

263. Under the shorthand method, the nominal amount (or net present value) of the net position in each foreign currency and in gold is converted at spot rates into the reporting currency[2]. The overall net open position is measured by aggregating:

- the sum of the net short positions or the sum of the net long positions, whichever is the greater; plus
- the net position (short or long) in gold, regardless of sign.

The capital charge is 8% of the overall net open position (see example below):

Example of the shorthand measure of foreign exchange risk

YEN	EURO	GBP	CA$	US$	GOLD
+50 +100 +150 -20 -180 -35	+100	+150	-20	-180	-35
+300			-200		35

The capital charge is 8% of the higher of either the net long currency positions or the net short currency positions (i.e. 300) and of the net position in gold (35) = 335x8% = 26.8.

[2] Where the bank is assessing its foreign exchange risk on a consolidated basis, it may be technically impractical in the case of some marginal operations to include the currency positions of a foreign branch or subsidiary of the bank. In such cases the internal limit in each currency may be used as a proxy for the positions. Provided there is adequate ex post monitoring of actual positions against such limits, the limits should be added, without regard to sign, to the net open position in each currency.

d) Commodities Risk

264. This sub-section sets out the minimum capital requirements to cover the risk of holding or taking positions in commodities (including precious metals, but excluding gold which is treated alongside foreign exchange risk in the previous sub-section). A commodity is defined as a physical product which is or can be traded on a secondary market e.g. agricultural products, minerals (including oil) and precious metals.

265. The price risk in commodities is often more complex and more volatile than that associated with currencies and interest rates. Commodity markets may also be less liquid than those for interest rates and currencies, with supply and demand changes consequently having more dramatic effects on price and volatility. These market characteristics can make price transparency and the effective hedging of commodities risk more difficult. Institutions also need to guard against the risk that arises when a short position falls due before a long position: owing to a shortage of liquidity, it may be difficult to close the short position, leaving the institution vulnerable to a market squeeze.

266. For spot or physical trading, the directional risk arising from a change in the spot price is the most important risk. However, the use of portfolio strategies involving forward or derivative contracts can involve a variety of additional risks which may well be larger than the risk of a change in spot prices. These include:

- 'basis risk' – i.e. the risk that the relationship between the prices of similar commodities alters over time;

- interest rate risk – i.e. the risk of a change in the cost of carry for forward positions and options; and

- forward gap risk – i.e. the risk that the forward price may change for reasons other than a change in interest rates.

267. The capital charges for commodities risk set out in this section are intended to provide cover against the above risks. In addition, however, there are credit counterparty risks on over-the-counter derivatives which must be included within credit risk capital requirements. Moreover, the funding of commodities positions may well create interest rate or foreign exchange risk which needs to be captured appropriately within the measurement framework set out earlier in this paper. Where a commodity is part of a forward contract (quantity of commodities to be received or delivered), any interest rate or foreign currency exposure from the other leg of the contract should be reported as set out in the provisions governing interest rate and foreign exchange rate risk, above. Positions which are purely stock financing (i.e. a physical stock has been sold forward and the cost of funding has been locked in until the date of the forward sale) may be omitted from the commodities risk calculation although they will be subject to interest rate and counterparty risk requirements.

268. There are three alternatives for measuring commodities position risk, as set out in the remainder of this section. As with other categories of market risk, institutions may use models subject to conditions set out below. Commodities risks can also be measured in a standardized manner, using either a very simple framework or a measurement system which captures forward gap and interest rate risk separately by basing the methodology on seven time-bands. Both the simplified approach and the maturity ladder approach are appropriate only for institutions conducting only a limited amount of commodities business. Major traders are expected over time to adopt a models approach subject to the safeguards set out below.

269. For the maturity ladder approach and the simplified approach, long and short positions in each commodity may be reported on a net basis for the purpose of calculating open positions. However, positions in different commodities are not generally offsettable in this way, unless the Authority is satisfied that, within particular sub-categories of the same commodity, products are deliverable against each other. They can also be considered as offsettable if they are close substitutes and a minimum correlation of 0.9 between the price movements can be clearly established over a minimum period of one year. Any institution seeking to base its calculation of capital charges on correlations must satisfy the Authority of the accuracy of its methodology, and obtain prior approval for its use. Where institutions use the models approach they can offset long and short positions in different commodities to a degree which is determined by empirical correlations; in the same way, a limited degree of offsetting is allowed for example between interest rates in different currencies.

(i) Models

270. Institutions may choose to adopt the models approach as set out in sub-section f), below**.** The methodology that is used must encompass:

- directional risk, to capture the exposure from changes in spot prices arising from net open positions;
- forward gap and interest rate risk, to capture the exposure to changes in forward prices arising from maturity mismatches; and
- basis risk, to capture the exposure to changes in the price relationships between two similar, but not identical, commodities.

It is also particularly important that models take proper account of market characteristics – notably delivery dates and the scope provided to traders to close out positions.

(ii) Maturity ladder approach

271. In calculating the capital charges under this approach, institutions first have to express each commodity position (spot and forward) in terms of the standard unit of measurement (e.g. barrels, kilograms etc). The positions in each commodity are then converted at current spot rates into the national currency.

272. Secondly, in order to capture forward gap and interest rate risk within a time-band (which together are sometimes referred to as curvature/spread risk), matched long and short positions in each time-band will carry a capital charge. The methodology is similar to that used for interest rate related instruments under the standardized measurement method, above. Positions in the separate commodities (expressed in terms of the standard unit of measurement) are first entered into a maturity ladder, with physical stocks entered into the first time-band. A separate maturity ladder is used for each commodity (see paragraph 269, above). (For markets which have daily delivery dates, any contracts maturing within ten days of one another may be offset.) For each time-band, the sum of short and long positions which are matched is multiplied first by the spot price for the commodity, and then by the appropriate spread rate for that band (as set out in the following table).

Time-bands and spread rates

Time-band	**Spread rate**
0-1 month	1.5%
1-3 months	1.5%
3-6 months	1.5%
6-12 months	1.5%
1-2 years	1.5%
2-3 years	1.5%
over 3 years	1.5%

273. The residual net positions from nearer time-bands can then be carried forward to offset exposures in time-bands that are farther out. However, recognizing that such hedging of positions among different time-bands is imprecise, a surcharge equal to 0.6% of the net position carried forward is added in respect of each time-band that the net position is carried forward. The capital charge for each matched amount created by carrying net positions forward is calculated as described in paragraph 272, above. At the end of this process an institution will have only long or only short positions, to which a capital charge of 15% applies. While, clearly there are differences in volatility between different commodities, in the interests of simplicity (given that institutions normally run relatively small open positions in commodities) one uniform capital charge applies to all open positions in commodities. Where more material risks are involved, institutions should adopt the models approach.

274. All commodity derivatives and off-balance sheet positions that are affected by changes in commodity prices should be included in the measurement framework for commodities risks. This includes commodity futures, commodity swaps and options, where the 'delta plus' method is used. (Where institutions are using other approaches to measure options risk, all options and the associated underlyings should be excluded

from both the maturity ladder approach and the simplified approach.) In order to calculate the risks, commodity derivatives are converted into notional commodities positions and assigned to maturities as follows:

a) futures and forward contracts relating to individual commodities are incorporated into the measurement framework as notional amounts of barrels, kilograms etc and assigned a maturity by reference to their expiry date;

b) commodity swaps where one leg is a fixed price and the other is the current market price should be incorporated as a series of positions equal to the notional amount of the contract, with one position corresponding with each payment on the swap, and slotted into the maturity ladder accordingly. The positions are long where the institution is paying fixed and receiving floating, and short if vice versa. (If one of the legs involves receiving/paying a fixed or floating interest rate, that exposure should be allocated to the appropriate repricing maturity band for the calculation of interest rate risk);

c) commodity swaps where the legs are in different commodities should be incorporated into the measurement framework of the respective commodities separately, without any offsetting (other than where the specific conditions in paragraph 269, above, are met).

(iii) Simplified Approach

275. In calculating the capital charge for directional risk, the same procedure applies as in the maturity ladder approach, described above. Once again, all commodity derivatives and off-balance sheet positions which are affected by changes in commodity prices must be included. The capital charge equals 15% of the net position, long or short, in each commodity.

276. In order to protect the institution against basis risk, interest rate risk and forward gap risk, the capital charge for each commodity, in accordance with paragraphs 271 and 274 above are subject to an additional capital charge equivalent to 3% of the institution's gross positions, long plus short, in that particular commodity. In valuing the gross positions in commodity derivatives for this purpose, the current spot price must be used.

e) Treatment of Options

277. Recognizing the wide diversity of institutions' activities in options and the difficulties of measuring price risk for options, several alternative approaches are permitted:
- those institutions solely using purchased options are free to use the simplified approach described later in this section;
- those institutions which also write options must use one of the intermediate approaches set out below or else a comprehensive risk management model meeting the requirements for internal models set out in the next section. The more significant its trading, the greater the level of sophistication expected in its measurement approach.

278. In the simplified approach, the positions for the options and the associated underlying, cash or forward, are not subject to the standardized methodology but rather are 'carved out' and subject to separately calculated capital charges that incorporate both general market risk and specific risk. The risk numbers thus generated are then added to the capital charges for the relevant category – i.e. interest rate related instruments, equities, foreign exchange and commodities as described in the previous sections. The delta-plus method uses the sensitivity parameters of 'greek letters' associated with options to measure their market risk and their capital requirements. Under this method, the delta-equivalent position of each option becomes part of the standardized methodology set out above, with the delta-equivalent amount subject to the applicable general market risk charges. Separate capital charges are then applied to the gamma and vega risks of the option positions. The scenario approach uses simulation techniques to calculate changes in the value of an options portfolio for changes in the level and volatility of its associated underlyings. Under this approach, the general market risk charge is determined by the scenario 'grid' (i.e. the specified combination of underlying and volatility changes) that produces the largest loss. For the delta-plus method and the scenario approach the specific risk capital charges are determined separately by multiplying the delta-equivalent of each option by the specific risk weights set out in the standardized interest rate risk methodology.

(i) Simplified approach

279. Institutions handling only a limited range of purchased option are free to use the simplified approach set out in the table below for particular trades. As an example of how the calculation would work, if a holder of 100 shares currently valued at $10 each holds an equivalent put option with a strike price of $11, the capital charge would be: $1000 x 16% (i.e. 8% specific plus 8% general market risk) = $160, less the amount the option is in the money ($11-$10) x 100 = $100, i.e. the capital charge would be $60. A similar methodology applies for options whose underlying is a foreign currency, an interest rate related instrument or a commodity.

Simplified approach: Capital charges

Position	Treatment
Long cash and long put or Short cash and long call	The capital charge is: [Market value of underlying security[1] x Sum of specific and general market risk charges[2] for the underlying] *minus* [Amount, if any, the option is in the money[3]] The capital charge calculated as above is bounded at zero, i.e., it cannot be a negative number.
Long call and/ or Long put (i.e., naked option positions)	The capital charge is the lesser of: i) Market value of the underlying security x Sum of specific and general market risk charges for the underlying; and ii) Market value of the option[4].

Notes to table:

1. In some cases such as foreign exchange, it may be unclear which side is the "underlying instrument"; this should be taken to be the asset which would be received if the option were exercised. In addition, the nominal value should be used for items where the market value of the underlying instrument could be zero, e.g., caps and floors, swap options etc.
2. Some options (e.g., where the underlying is an interest rate, a currency or a commodity) bear no specific risk, but specific risk is present in the case of options on certain interest rate related instruments (e.g., options on a corporate debt security or a corporate bond index - see Section A for the relevant capital charges), and in the case of options on equities and stock indices (see Section B for the relevant capital charges). The capital charge for currency options is 8% and for options on commodities is 15%.
3. For options with a residual maturity of more than six months, the strike price should be compared with the forward, not the current, price. An institution unable to do this should take the "in the money" amount to be zero.
4. Where the position does not fall within the trading book options on certain foreign exchange and commodities positions not belonging to the trading book), it is acceptable to use the book value instead of the market value.

(ii) Intermediate approaches

Delta-plus method

280. Institutions that write options may include delta-weighted option positions within the standardized methodology set out in preceding sub-sections. Each option must be reported as a position equal to the market value of the underlying multiplied by the delta. However, since delta does not sufficiently cover all the risk associated with options positions, institutions are also required to measure gamma (which measures the rate of change of delta) and vega (which measures the sensitivity of the value of an option with respect to a change in volatility) sensitivities in order to calculate the total capital charge. These sensitivities are to be calculated according to an approved exchange model or to the institution's proprietary options pricing model where that has been reviewed by the Authority.

281. Delta-weighted positions with debt securities or interest rates as the underlying are slotted into the interest rate time-bands, as set out in the standardized interest rate risk approach described earlier, under the following procedure. A two-legged approach is used as for other derivatives, requiring one entry at the time the underlying contract takes effect and a second at the time the underlying contract matures. For instance, a bought call option on a June three-month interest rate will in April be considered, on the basis of its delta-equivalent value, to be a long position with a maturity of five months and a short position with a maturity of two months. (A two months call option on a bond future where delivery of the bond takes place in September would be considered in April as being long the bond and short a five months deposit, both positions being delta-weighted.) The written option is similarly slotted as a long position with a maturity of two months and a short position with a maturity of five months. Floating rate instruments with caps or floors are treated as a combination of floating rate securities and a series of European-style options. For example, the holder of a three year floating rate note indexed to six month LIBOR with a cap of 15% treats it as:
(i) a debt security that reprices in six months; and
(ii) a series of written call options on a FRA with a reference rate of 15%, each with a negative sign at the time the underlying FRA takes effect and a positive sign at the time the underlying FRA matures. (The rules applying to closely matched positions set out in paragraph 238, above, also apply here.)

282. The capital charge for options with equities as the underlying are also based on the delta-weighted positions which are incorporated in the measure of market risk for equity position risk, described earlier. For the purposes of this calculation, each national market is to be treated as a separate underlying. The capital charge for options on foreign exchange and gold positions is based on the method set out in the foreign exchange and gold risk section of these rules. For delta risk, the net delta-based equivalent of the foreign currency and gold options are incorporated into the measurement of the exposure for the respective currency (or gold) position. The capital charge for options on commodities is based on the simplified or the maturity ladder

approach set out in that sub-section. The delta-weighted positions are incorporated in one of the measures described therein.

283. In addition to the above capital charges to cover delta risk, there are further capital charges for gamma and vega risk. Institutions using the delta-plus method must calculate the gamma and vega for each option position (including hedge positions) separately. The capital charges are calculated in the following way:

(i) For each individual option position, a gamma impact is calculated according to a Taylor series expansion as

Gamma impact = 0.5 x Gamma x VU^2
where VU = variation of the underlying of the option

(ii) VU is calculated as follows:

a) for interest rate options, where the underlying is a bond, the market value of the underlying is multiplied by the risk weights shown in the table following paragraph 227, above. An equivalent calculation is carried out where the underlying is an interest rate, based on the assumed changes in yield set out in that table;

b) for options on equities and equity indices, the market value of the underlying is multiplied by 8%;

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

d) for commodities options, the market value of the underlying is multiplied by 15%.

(iii) For the purpose of this calculation the following positions should be treated as the same underlying:

- for interest rates, each time-band set out in the table following paragraph 227, above (or, where appropriate, the duration time-bands);
- for equities and stock indices, each national market;
- for foreign currencies and gold, each currency pair, and gold;
- for commodities, each individual commodity as defined in the relevant section above.

(iv) Each option on the same underlying will have a gamma impact that is either positive or negative. These individual gamma impacts are summed, resulting in a net gamma impact for each underlying that is either positive or negative. Only those net gamma impacts that are negative are included in the capital calculation.

(v) The total gamma capital charge is the sum of the absolute value of the net negative gamma impacts as calculated above.

(vi) For volatility risk (vega), institutions are required to calculate the capital charges by multiplying the sum of the vegas for all options on the same underlying, as defined above, by a proportional shift in volatility of ±25%.

(vii) The total vega capital charge is the sum of the absolute value of the individual vega capital charges that have been calculated for vega risk.

Scenario approach

284. More sophisticated institutions may base the market risk capital charge for options portfolios and associated hedging positions on scenario matrix analysis. This is accomplished by specifying a fixed range of changes in the option portfolio's risk factors and calculating changes in the value of the option portfolio at various points along this 'grid'. For the purpose of calculating the capital charge institutions have to revalue the option portfolio using matrices for simultaneous changes in the option's underlying rate or price and in the volatility of that rate or price. A different matrix is set up for each individual underlying, pursuant to paragraph 283, above. Alternatively, where institutions are significant traders in options, the Authority permits, in the case of interest rate options the calculation to be based on a minimum of six sets of time-bands. When using this method, not more than three of the time-bands defined in the table following paragraph 227, above (or the equivalent duration time-bands) may be combined into any one set.

285. The options and related hedging positions are evaluated over a specified range above and below the current value of the underlying. The range for interest rates is consistent with the assumed changes in yield in the table following paragraph 227, above. Those institutions using the alternative method for interest rate options permitted in paragraph 284, above must use, for each set of time-bands, the highest of the assumed changes in yield applicable to the group to which the time-bands belong. (For example, if the time-bands 3-4 years, 4-5 years and 5-7 years are combined, the highest assumed change in yield of those three bands would be 0.75.) The other ranges are +/- 8% for equities, +/- 8% for foreign exchange and gold, and +/- 15% for commodities. For all risk categories, at least seven observations (including the current observation) should be used to divide the range into equally spaced intervals.

286. The second dimension of the matrix entails a change in the volatility of the underlying rate or price. A single change in the volatility of the underlying rate or price equal to a shift in volatility of +25% and –25% is expected to be sufficient in most cases. However, the Authority may opt to require a different change in volatility be used and/or that intermediate points on the grid be calculated.

287. After calculating the matrix, each cell contains the net profit or loss of the option and the underlying hedge instrument. The capital charge for each underlying is then calculated as the largest loss contained in the matrix.

288. The application of the scenario analysis by an institution is subject to the Authority's specific consent. Use of scenario analysis as part of the standardized methodology is also subject to the Authority's validation, having regard in particular to such of the qualitative standards listed in the following section with regard to use of the internal models approach as are appropriate to the nature of the business.

289. The intermediate approaches cover only the major risks associated with options. So far as specific risk is concerned, only the delta-related elements are captured; to capture other risks would require much more complicated provisions. At the same time, in certain respects, this is balanced by the fact that the simplifying assumptions used result in a relatively conservative treatment of certain options positions. The Authority reserves the right to introduce amendment in light of experience.

290. Certain options risks e.g. rho (the rate of change in the value of the option with respect to interest rates) and theta (rate of change of the value of the option with respect to time) are not measured in the current provisions. Institutions undertaking significant options business are encouraged at the least to ensure that they monitor such risks carefully. Where they wish to incorporate rho into their capital calculations for interest rate risk, they are permitted to do so.

f) Use of Internal Models

1. General criteria

291. The use by institutions of risk measures derived from their internal models requires explicit approval from the Authority. Such approval is only given where, at a minimum, the following criteria are met:

- the Authority is satisfied that the institution's risk management system is conceptually sound and implemented with integrity;
-the Authority is satisfied that the institution has sufficient numbers of staff skilled in the use of sophisticated models not only in the trading area but also in the risk control, audit, and if necessary, back office areas;
- the Authority judges that the institution's models have a proven track record of reasonable accuracy in measuring risk;
- the institution regularly conducts stress tests along the lines of those described later in this section.

292. The Authority normally requires a reasonable period of initial monitoring and live testing of an institution's internal model before it may be used for supervisory purposes.

293. In addition to the above general criteria, institutions using internal models for capital purposes are subject to all the requirements detailed in the remainder of this section.

2. Qualitative standards

294. It is important for the Authority to be able to satisfy itself that institutions using models have market risk management systems that are conceptually sound and implemented with integrity. Accordingly, the following qualitative criteria must be met before permission can be given to move to a models-based approach. The extent to which the qualitative criteria are met also helps to determine the level of the multiplication factor that is set for an institution, as described later in this section. Only those with models that, in the Authority's judgment, are in full compliance with the qualitative criteria are eligible for application of the minimum multiplication factor of 3.

295. The qualitative criteria involve the following:

(a) the institution should have an independent risk control unit that is responsible for the design and implementation of the overall risk management system. The unit should produce and analyse daily reports on the output of the risk measurement model, including an evaluation of the relationship between the measures of risk exposure and the trading limits. This unit must be independent from the business trading units and should report directly to senior management.

(b) the unit should conduct a regular back-testing programme, i.e. an ex-post comparison of the risk measure generated by the model against the actual daily changes in portfolio value over longer periods of time, as well as hypothetical changes based on static positions.

(c) the unit should also conduct the initial and ongoing validation of the internal model.

(d) the board of directors and senior management should be actively involved in the risk control process and must regard such process as an essential aspect of the business to which significant resources need to be devoted. In this regard, the daily reports prepared by the independent risk control unit must be reviewed by a level of management with sufficient seniority and authority to enforce both reductions of positions taken by individual traders and reductions in the overall risk exposure.

(e) the internal risk measurement model must be closely integrated into the day-to-day risk management process of the institution. Its output should, accordingly, be an integral part of the process of planning, monitoring and controlling its market risk profile.

(f) the risk measurement system should be used in conjunction with the internal trading and exposure limits. In this regard, trading limits should be related to the risk measurement model in a manner that is consistent over time and that is well-understood by both traders and senior management.

(g) a routine and rigorous programme of stress testing should be in place as a supplement to the risk analysis based on the day-to-day output of the risk measurement model. The results of stress testing should be reviewed periodically by senior management, used in the internal assessment of capital adequacy, and reflected in the policies and limits set by management and the board of directors. Where stress tests reveal particular vulnerability to a given set of circumstances, prompt steps should be taken to manage those risks appropriately (e.g., by hedging against that outcome or reducing the size of the institution's exposures, or increasing capital).

(h) the institution should have a routine in place for ensuring compliance with a documented set of internal policies, controls and procedures concerning the operation of the risk measurement system. The risk measurement system must be well documented, for example, through a risk management manual that describes the basic principles of the risk management system and that provides an explanation of the empirical techniques used to measure market risk.

(i) an independent review of the risk measurement system should be carried out regularly in the institution's own internal auditing process. This review should include both the activities of the business trading units and of the independent risk management unit. A review of the overall risk management process should take place at regular intervals (ideally not less than once a year) and should specifically address, at a minimum:

  (i) the adequacy of the documentation of the risk management system and process;
  (ii) the organisation of the risk control unit;
  (iii) the integration of market risk measures into daily risk management;
  (iv) the approval process for risk pricing models and valuation systems used by front- and back-office personnel;
  (v) the validation of any significant changes in the risk measurement process;

(vi) the scope of market risks captured by the risk measurement model;
(vii) the integrity of the management information system;
(viii) the accuracy and completeness of position data;
(ix) the verification of the consistency, timeliness and reliability of data sources used to run internal models, including the independence of such data sources;
(x) the accuracy and appropriateness of volatility and correlation assumptions;
(xi) the accuracy of valuation and risk transformation calculations;
(xii) the verification of the model's accuracy through frequent back-testing, as described below. (See also the Supervisory Framework for the Use of Backtesting in Conjunction with the Internal Models Approach to Market Risk Capital Requirements, prepared by the Basel Committee and appearing as Annex 2.18 to this paper.

3. Specification of market risk factors

296. An important part of an institution's internal market risk measurement system is the specification of an appropriate set of market risk factors, i.e. the market rates and prices that affect the value of its trading positions. The risk factors contained in a market risk measurement system should be sufficient to capture the risks inherent in the institution's portfolio of on- and off-balance sheet trading positions. Although institutions have some discretion in specifying the risk factors for their internal models, the following guidelines should be fulfilled.

(a) For interest rates, there must be a set of risk factors corresponding to interest rates in each currency in which the institution has interest-rate-sensitive on- or off-balance sheet positions.

- The risk measurement system should model the yield curve using one of a number of generally accepted approaches, for example, by estimating forward rates of zero coupon yields. The yield curve should be divided into various maturity segments in order to capture variation in the volatility of rates along the yield curve; there will typically be one risk factor corresponding to each maturity segment. For material exposures to interest rate movements in the major currencies and markets, institutions must model the yield curve using a minimum of six risk factors. However, the number of risk factors used must ultimately reflect the nature of the trading strategies. For instance, an institution which has a portfolio of various types of securities across many points of the yield curve and which engages in complex arbitrage strategies requires a greater number of risk factors to capture interest rate risk accurately.

- The risk measurement system must incorporate separate risk factors to capture spread risk (e.g. between bonds and swaps). A variety of approaches may be used to capture the spread risk arising from less than perfectly correlated movements between government and other fixed-income interest rates, such as specifying a completely separate yield curve for non-government fixed-income instruments (for instance, swaps or municipal securities) or estimating the spread over government rates at various points along the yield curve.

(b) For exchange rates (which may include gold), the risk measurement system should incorporate risk factors corresponding to the individual foreign currencies in which the institution's positions are denominated. Since the value-at-risk figure calculated by the risk measurement system will be expressed in the institution's reporting currency, any net position denominated in a foreign currency will introduce a foreign exchange risk. Thus, there must be risk factors corresponding to the exchange rate between the reporting currency and each foreign currency in which there is a significant exposure.

(c) For equity prices, there should be risk factors corresponding to each of the equity markets in which significant positions are held:

- at a minimum, there should be a risk factor that is designed to capture market-wide movements in equity prices (e.g., a market index). Positions in individual securities or in sector indices may be expressed in 'beta-equivalents' relative to this market-wide index. (A 'beta-equivalent' position would be calculated from a market model of equity price returns (such as the CAPM model) by regressing the return on the individual stock or sector index on the risk-free rate of return and the return on the market index.)

- a somewhat more detailed approach would be to have risk factors corresponding to various sectors of the overall equity market (for instance, industry sectors or cyclical and non-cyclical sectors). As above, positions in individual stocks within each sector could be expressed in 'beta-equivalents' relative to the sector index.

- the most extensive approach would be to have risk factors corresponding to the volatility of individual equity issues.

- the sophistication and nature of the modelling technique for a given market should correspond to the institution's exposure to the overall market as well as its concentration in individual equity issues in that market.

(d) For commodity prices there should be risk factors corresponding to each of the commodity markets in which significant positions are held:

- for institutions with relatively limited positions in commodity-based instruments, a straightforward specification of risk factors is acceptable. Such a specification might typically entail one risk factor for each commodity price to which there is exposure. In cases where the aggregate positions are reasonably small, it may be acceptable to use a single risk factor for a relatively broad sub-category of commodities (for instance, a single risk factor for all types of oil).

- for more active trading, the model must also take account of variation in the 'convenience yield' between derivatives positions such as forwards, swaps and cash positions in the commodity. (The 'convenience yield' reflects the benefits of direct ownership of the physical commodity – e.g. the ability to profit from temporary market shortages – and is affected by both market conditions and factors such as physical storage costs.)

4. Quantitative standards

297. Institutions have flexibility in devising the precise nature of their models, but the following minimum standards apply for the purpose of calculating the capital charge. Institutions may always opt to apply stricter standards.

(a) "Value-at-risk" must be computed on a daily basis.

(b) In calculating the value-at-risk, a 99th percentile, one-tailed confidence interval is to be used.

(c) In calculating the value-at-risk, an instantaneous price shock equivalent to a 10-day movement in prices is to be used, i.e., the minimum "holding period" will be ten trading days. Institutions may use value-at-risk numbers calculated according to shorter holding periods scaled up to ten days by the square root of time (for the treatment of options, see also (h) below).

(d) The choice of historical observation period (sample period) for calculating value-at-risk is constrained to a minimum length of one year. For institutions which use a weighting scheme or other methods for the historical observation period, the "effective" observation period must be at

least one year (i.e., the weighted average time lag of the individual observations cannot be less than 6 months).

(e) Data sets must be updated no less frequently than once every three months, and should also be reassessed whenever market prices are subject to material changes. In the event of a significant upsurge in price volatility, the Authority reserves the right to require calculation of value-at-risk using a shorter observation period.

(f) No particular type of model is prescribed. So long as each model used captures all the material risks run, institutions are free to use models based, for example, on variance-covariance matrices, historical simulations, or Monte Carlo simulations.

(g) Institutions have discretion to recognize empirical correlations within broad risk categories (i.e., interest rates, exchange rates, equity prices and commodity prices, including related options volatilities in each risk factor category). They are not permitted to recognize empirical correlations across broad risk categories without prior approval. Applications may be made, on a case-by-case basis, for empirical correlations across broad risk categories to be recognized, where the Authority is satisfied as to the soundness and integrity of the institution's system for measuring those correlations.

(h) Models must accurately capture the unique risks associated with options within each of the broad risk categories. The following criteria apply to the measurement of options risk:

i) models must capture the non-linear price characteristics of options positions;

ii) institutions are expected to move towards the application of a full 10-day price shock to options positions or positions that display option-like characteristics;

iii) each institution's risk measurement system must have a set of risk factors that captures the volatilities of the rates and prices underlying the option positions, i.e., vega risk. Those with relatively large and/or complex options portfolios should have detailed specifications of the relevant volatilities. This means that institutions should measure the volatilities of options positions split by different maturities.

(i) Each institution must meet, on a daily basis, a capital requirement expressed as the higher of 1 and 2 below, multiplied by a multiplication factor (see (j) below):

1 its previous day's value-at-risk number measured according to the parameters specified in (a) to (h) above; and

2 an average of the daily value-at-risk measures on each of the preceding sixty business days.

(j) The multiplication factor is set by the Authority, on the basis of an assessment of the quality of each risk management system, and subject to an absolute minimum of 3. Institutions are required to add to the factor set by the Authority, a "plus factor" directly related to the ex-post performance of the model, thereby introducing a built-in positive incentive to maintain the predictive quality of the model. The plus factor will range from 0 to 1 based on the outcome of the institution's back-testing. If the back-testing results are satisfactory and all of the qualitative standards set out above, a plus factor of zero may apply. Annex 2.18 provides additional details of the approach to be applied for back-testing and the plus factor. Generally, the Authority requires back-testing to be performed on the basis of actual trading outcomes; however, it may also in certain cases seek additional back-testing information on the basis of hypothetical positions (i.e. using changes in portfolio value that would occur if end of day positions were to remain unchanged).

(k) Institutions using models will also be subject to a capital charge to cover specific risk (as defined under the standardized approach for market risk) of interest rate related instruments and equity securities. The manner in which the specific risk capital charge is to be calculated is set out later in this section.

5. Stress testing

298. Institutions using the internal models approach for calculating market risk capital requirements must have in place a rigorous and comprehensive stress-testing programme. Stress testing to identify events or influences that could greatly impact the institution is a key component of its assessment of its capital position.

299. Stress scenarios need to cover a range of factors that can create extraordinary losses or gains in trading portfolios, or make the control of risk in those portfolios very difficult. These factors include low-probability events in all major types of risks, including the various components of market, credit and operational risks. Stress scenarios need to shed light on the impact of such events on positions that display both linear and non-linear characteristics (i.e., options and instruments that have option-like characteristics).

300. Stress tests should be both of a quantitative and qualitative nature, incorporating both market risk and liquidity aspects of market disturbances. Quantitative criteria should identify plausible stress scenarios to which institutions could be exposed. Qualitative criteria should reinforce the fact that two major goals of stress testing are to evaluate the

capacity of the institution's capital to absorb potential large losses and to identify steps it can take to reduce its risk and conserve capital. This assessment is integral to setting and evaluating the institution's risk management strategy, and the results of stress testing should be routinely communicated to senior management and, periodically, to the board of directors.

301. Institutions should combine the use of stress scenarios as set out at (a), (b) and (c) below, with stress tests developed by them to reflect their specific risk characteristics. In particular, institutions are asked to provide information on stress testing in three broad areas:

(a) Supervisory scenarios requiring no simulations by the institution

Institutions should have information on the largest losses experienced during the reporting period available for supervisory review. This loss information is compared with the level of capital that results from the internal measurement system, enabling identification, for example, of the number of days of peak day losses that would have been covered by a given value-at-risk estimate.

(b) Scenarios requiring a simulation by the institution

Institutions should subject their portfolios to a series of simulated stress scenarios and provide the Authority with the results. These scenarios may include testing the current portfolio against past periods of significant disturbance – for example, the 1987 equity market crash, the European Exchange Rate Mechanism crises of 1992 and 1993 or the fall in bond markets in the first quarter of 1994, incorporating both the large price movements and the sharp reduction in liquidity associated with these events. A second type of scenario evaluates the sensitivity of market risk exposure to changes in the assumptions about volatilities and correlations. Applying this test would require an evaluation of the historical range of variation for volatilities and correlations and evaluation of the current positions held against the extreme values of the historical range. Due consideration should be given to the sharp variation that, at times, has occurred in a matter of days in periods of significant market disturbance. The 1987 equity market crash, the suspension of the ERM or the fall in bond markets in the first quarter of 1994, for example, all involved correlations within risk factors approaching the extreme values of 1 or -1 for several days at the height of the disturbance.

(c) Scenarios developed by the institution to capture the specific characteristics of its portfolio

In addition to the general scenarios identified in (a) and (b) above, an institution should also develop its own stress tests which it identifies as

most adverse, based on the characteristics of its portfolio (e.g. problems in a key region of the world combined with a sharp move in oil prices). The Authority should be provided with a description of the methodology used to identify and carry out the scenarios as well as with a description of the results derived from these scenarios.

6. External validation of models

302. Before granting approval for the use of internal models, the Authority requires that models are first validated by both the internal and external auditors of the institution. It reviews the validation procedures performed by the internal and external auditors, and may independently carry out further validation procedures.

303. The validation of models by the external auditors should include, at a minimum, the following steps:

(a) verifying and ensuring that the internal validation processes described above are operating satisfactorily;

(b) ensuring that the formulae used in the calculation process as well as for the pricing of options and other complex instruments are validated by a qualified unit, which in all cases should be independent from the trading area;

(c) checking and ensuring that the structure of the internal models is adequate with respect to the institution's activities and geographical coverage;

(d) checking the results of the institution's back-testing of its internal measurement system (i.e., comparing value-at-risk estimates with actual profits and losses) to ensure that the model provides a reliable measure of potential losses over time. This means that institutions should make the results as well as the underlying inputs to their value-at-risk calculations available to the Authority, as well as to their external auditors, upon request ; and

(e) making sure that data flows and processes associated with the risk measurement system are transparent and accessible. In particular, it is necessary that auditors and supervisory authorities are able to have ready access, as and when they judge it necessary (and subject to appropriate procedures) to the models' specifications and parameters.

7. Combination of internal models and the standardized methodology

304. Other than where exposure to a particular risk factor (e.g. commodity prices) is insignificant, the internal models approach in principle requires institutions to have an integrated risk measurement system that captures the broad risk factor categories (i.e., interest rates, exchange rates (which may include gold), equity prices and commodity prices, with related options volatilities being included in each risk factor category). Thus, institutions which start to use models for one or more risk factor categories are expected, over a reasonable period of time, to extend the models to all their market risks.

305. An institution using one or more models will no longer be able to revert to measuring the risk measured by those models according to the standardized methodology, unless the Authority withdraws approval for that model. However, the Authority does not apply a fixed period time within which institutions using a combination of internal models and the standardized methodology must move to a comprehensive model. Rather, this is determined having regard to the particular circumstances of each case. For institutions which, for the time being, are using a combination of internal models and the standardized methodology, the following conditions apply:

(a) each broad risk factor category must be assessed using a single approach (either internal models or the standardized approach), i.e., no combination of the two methods is, in principle, permitted within a risk factor category or across different entities for the same type of risk. (However, institutions may incur risks in positions not captured by their models – e.g. in remote locations, in minor currencies or in negligible business areas. Such risks should be measured according to the standardized methodology.);

(b) all of the criteria set out in this section apply to the models that are used;

(c) institutions may not modify the combination of the two approaches they are using without obtaining prior clearance from the Authority:

(d) no element of market risk may escape measurement, i.e. the exposure for all the various risk factors, whether calculated according to the standardized approach or internal models, must be captured; and

(e) the capital charges assessed under the standardized approach and under the models approach should be aggregated using the simple sum method.

8. Transitional arrangements

306. Notwithstanding paragraphs 304 and 305 above, the Authority is prepared to show flexibility with regard to 'partial' models during a reasonable transitional period as institutions work to further enhance their risk measurement models. Accordingly,

provided it can be satisfied that 'cherry-picking' between the standardized and models approach is not being sought, the Authority is prepared to consider permitting the use of a model which may not achieve e.g. full worldwide coverage within a risk category.

9. Treatment of specific risk

307. Where an institution has a VaR measure that incorporates specific risk and that meets all the qualitative and quantitative requirements for general risk models, it may base its charge on modeled estimates, provided the measure is based on models that meet the additional criteria and requirements set out below. Those unable to meet the additional criteria are required to base their specific risk capital charge on the full amount of the specific risk charge calculated under the standardized methodology.

308. The criteria for supervisory recognition of institutions' modeling of specific risk require that the model used must capture all material components of price risk and be responsive to changes in market conditions and compositions of portfolios. In particular, the model must:

i) explain the historical price variation in the portfolio[3];
ii) capture concentrations (magnitude and changes in composition)[4];
iii) be robust to an adverse environment[5];
iv) capture name-related basis risk[6];
v) capture event risk[7]; and
vi) be validated through back-testing[8].

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[3] The key ex ante measures of model quality are "goodness-of-fit" measures which address the question of how much of the historical variation in price value is explained by the model. One measure of this type which can often be used is an R-squared measure from regression methodology. If this measure is to be used, the model would be expected to be able to explain a high percentage, such as 90%, of the historical price variation or to explicitly include estimates of the residual variability not captured in the factors included in this regression. For some types of model, it may not be feasible to calculate a goodness-of-fit measure. In such an instance, an institution is expected to contact the Authority to define an acceptable alternative measure which would meet this regulatory objective.

[4] The institution would be expected to demonstrate that the model is sensitive to changes in portfolio construction and that higher capital charges are attracted for portfolios that have increasing concentrations in particular names or sectors.

[5] The institution should be able to demonstrate that the model will signal rising risk in an adverse environment. This could be achieved by incorporating in the historical estimation period of the model at least one full credit cycle and ensuring that the model would not have been inaccurate in the downward portion of the cycle. Another approach for demonstrating this is through simulation of historical or plausible worst-case environments.

[6] Institutions should be able to demonstrate that the model is sensitive to material idiosyncratic differences between similar but not identical positions, for example debt positions with different levels of subordination, maturity mismatches, or credit derivatives with different default events.

[7] For debt positions, this should include migration risk. For equity positions, events that are reflected in large changes or jumps in prices must be captured e.g. merger break-up/takeovers. In particular, firms must consider issues relating to survivorship bias.

[8] Aimed at assessing whether specific risk, as well as general market risk, is being captured adequately.

309. Where an institution is subject to event risk that is not reflected in its VaR measure, because it is beyond the 10 day holding period and 99 percent confidence interval (i.e. low probability and high severity events), it must ensure that the impact of such events is factored into its internal capital assessment, for example through its stress testing.

310. An institution's model must conservatively assess the risk arising from less liquid positions and/or positions with limited price transparency under realistic market scenarios. In addition, the model must meet minimum data standards. Proxies may be used only where available data are insufficient or are not reflective of the true volatility of a position or portfolio, and only where they are appropriately conservative. As techniques and best practices evolve, institutions should avail themselves of these advances.

311. In addition, institutions must have an approach in place to capture in its regulatory capital default risk of its trading book positions that is incremental to the risk captured by the VaR-based calculation specified above. To avoid double-counting, an institution may, when calculating its incremental default charge, take into account the extent to which default risk has already been incorporated into the VaR calculation, especially for risk positions that could and would be closed within 10 days in the event of adverse market conditions or other indications of deterioration in the credit environment. No specific approach for capturing the incremental default risk is prescribed; it may be part of the institution's internal model or a surcharge from a separate calculation. Where the incremental risk is captured through a surcharge, the surcharge is not subject to a multiplier or regulatory back-testing; however, the institution should be able to demonstrate that the surcharge meets its aim.

312. Whichever approach is used, an institution must demonstrate that it meets a soundness standard comparable to that of the internal-ratings based approach for credit risk set out in this capital framework, under the assumption of a constant level of risk, and adjusted where appropriate to reflect the impact of liquidity, concentrations, hedging and optionality. Institutions not capturing the incremental default risk through an internally developed approach must use the fallback of calculating the surcharge through an approach consistent with that for credit risk.

313. In all cases, cash or synthetic exposures that would be subject to a deduction treatment under the securitization framework under these rules (e.g. equity tranches that absorb first losses), as well as securitization exposures that are unrated liquidity lines or letters of credit, would be subject to a capital charge that is no less than that applying under the securitization provisions. (Such deduction treatment items include risk equivalent positions e.g. inventories of credit exposures that the institution intends to sell through cash securitizations and for which it has in place tranched credit protections so that it retains an exposure.)

314. An exception to this treatment may apply for institutions that are dealers in such exposures, where they can demonstrate, in addition to trading intent, that a liquid two-way market exists for the securitization exposures, or in the case of synthetic

securitizations that rely solely on credit derivatives, for the securitization exposures themselves or all their constituent risk components. A two-way market is deemed to exist for these purposes 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 day and settled at such price within a relatively short time conforming to trade custom. In addition, for an institution to apply this exception, it must have sufficient market data to ensure it fully captures the concentrated default risk in accordance with the above standards.

315. Institutions which apply modelled estimates of specific risk are required to conduct backtesting aimed at assessing whether specific risk is being accurately captured. The methodology to be used for validating the specific risk estimates involves performing separate backtests on sub-portfolios using daily data on sub-portfolios subject to specific risk. The key sub-portfolios for this purpose are traded debt and equity positions. However, if the trading portfolio is decomposed into finer categories (e.g., emerging markets, traded corporate debt, etc.), these distinctions should also be employed for sub-portfolio back-testing purposes. Institutions are required to commit to a sub-portfolio structure and to retain that structure unless it can be demonstrated to the Authority that a change would be appropriate.

316. Institutions must have in place a process to analyze exceptions identified through the back-testing of specific risk. This process is intended to serve as the fundamental means by which models of specific risk can be corrected in the event they become inaccurate. There is a presumption that models incorporating specific risk are 'unacceptable' if the results at the sub-portfolio level produce a number of exceptions commensurate with the Red Zone (see Annex 2.18). In such cases, immediate action should be taken to correct the problem in the model and to ensure that there is a sufficient capital buffer to absorb the risk that appears not to have been adequately captured.

10. Model validation standards

317. It is important for institutions to have in place processes to ensure that their internal models have been adequately validated by suitably qualified parties independent of the development process to ensure that they are conceptually sound and adequately capture all material risks. This validation should 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 model no longer being adequate. More extensive model validation is particularly important where specific risk is also modeled, and is required to meet the further specific risk criteria. As techniques and best practices evolve, institutions should avail themselves of these advances. Model validation should not be limited to backtesting but should, at a minimum, also include the following:

(a) tests to demonstrate that any assumptions made within the internal model are appropriate and do not underestimate risk This may include the assumption of

the normal distribution, the use of the square root of time to scale from a one day holding period to a 10 day holding period or where extrapolation or interpolation techniques are used, or pricing models;

(b) further to the regulatory backtesting programmes, testing for model validation should be carried out using additional tests, which may include for instance:

- tests carried out using hypothetical changes in portfolio value that would occur were end of day positions to remain unchanged. It therefore excludes fees, commissions, bid-ask spreads, net interest income and intra-day trading;
- testing carried out for longer periods than required for the regular backtesting programme (e.g. 3 years). The longer time period generally improves the power of the backtesting. A longer time period may not be desirable if the VaR model or market conditions have changed to the extent that historical data are no longer relevant;
- testing carried out using confidence intervals other than the 99 percent interval required under the quantitative standards;
- testing of portfolios below the overall institution level.

(c) the use of hypothetical portfolios to ensure that the model is able to account for particular structural features that may arise, e.g.:

- where data histories for a particular instrument do not meet the normal quantitative standards and where the institution has to map these positions to proxies, then it must ensure that the proxies produce conservative results under the relevant market scenarios;
- ensuring that material basis risks are adequately captured. This may include mismatches between long and short positions by maturity or by issuer;
- ensuring that the model captures concentration risk that may arise in an undiversified portfolio.

Part 3

Pillar 2 – Supervisory Review

Introduction

1. Pillar 2 introduces new requirements and expectations for both banks and supervisory authorities:

i Banks must be able to demonstrate that they have in place procedures that enable senior management to ensure that they have, and will continue to have, sufficient capital and controls in place to mitigate the risks in the business, both currently and looking forward at least 3 years.

Management should summarize the key components of their **capital assessment and risk profile** procedures **(CARP)** in a document that is formally reviewed and endorsed by the Board at least annually. This document should be made available to the Authority on request. It is an important element in the Board's ongoing responsibility for ensuring, and demonstrating to the Authority, that the risk profile, the level, distribution and composition of capital, the control framework and strategic planning are appropriately integrated and consistent.

ii The Authority will integrate the CARP document into its **supervisory assessment process (SAP)**. A well structured CARP document helps the Authority and the Board identify where there may be differences in their respective views on the adequacy of the overall governance arrangements and whether the control environment and capital available are consistent with the institution's risk profile.

The Authority's assessment of the CARP document is a significant input to determining the minimum level of regulatory capital the Authority requires each bank under its regulatory oversight to maintain.

The Authority's Approach to Implementing Pillar 2

2. As a general point, the Authority remains committed to having a framework that is sufficiently flexible to be applied, both by the senior management of firms and by supervisors, in a way that is proportionate to the size, business and risk profiles of the entities/groups concerned.

3. As part of this approach, the Authority seeks to satisfy itself that there is an acceptable and justifiable balance between the risk profile, the amount of capital held and techniques employed by the institution to manage and mitigate its risks effectively. The

use of effective risk management techniques will, other things being equal, yield capital benefits to institutions.

The relationship between Pillars 1 and 2 (the need for additional capital)

4. While the Pillar 1 capital calculation provides a sound base measurement of the minimum level of capital required to support the credit, market and operational risks of banks, it does not cover all the risks to which a bank is exposed. A bank's own assessment of the amount of capital required for regulatory purposes (assuming it will be on the Standardized approaches) should be derived by management using a "Pillar 1 plus" approach. This requires each bank to have regard to the various business and other risks identified below that are material to it but which are not captured by the Pillar 1 methodology. However, in setting the actual regulatory capital requirement for each bank, the Authority conducts its own assessment of a bank's risk profile and other factors, such as the adequacy of the governance arrangements, and will, where it considers it prudent to do so, make adjustments to the bank's own internal calculations. This process is covered in more detail in paragraphs 29 to 31 and in Annex 3.3. In all cases, the Pillar 1 capital figure determines the absolute floor for regulatory capital at the consolidated group and legal entity levels.

5. Some factors that might lead to the need for additional capital under Pillar 2 include:

i the further an institution's business profile differs from the "diversified group" model that underpins the Pillar 1 methodology in Basel II, the more likely it is that additional capital should be held to reflect that lack of diversity;

ii the presence of risks (see paragraph 17 for details) only partially, or not at all, captured by Pillar 1- unless management can show that those risks are adequately mitigated in some other way, e.g. by recognized risk management techniques that have been put into place and assessed as adequate by the Authority;

iii there may also be strategic or cyclical risks inherent in a business model that need to be incorporated in a bank's capital planning. These will become apparent when management conduct appropriate stress and scenario tests – the results of which should be shared and discussed with the Authority and summarized in the institution's CARP document.

6. A capital adjustment determined by the Authority may also reflect a fundamental difference in purpose between a bank's own assessment of the total amount of capital it needs to satisfy shareholder and market expectations - e.g. to underpin its rating/share price - and the specific depositor protection consideration of supervisors. The two are not always identical. It is important that the CARP document make clear on which basis it has been prepared.

7. The Authority aims to determine any such capital adjustments in a transparent manner and explain its thinking so that banks know clearly what they have to do to address any concerns raised. However, increased capital is not viewed by the Authority as the only option where it identifies enhanced risks in a bank. This is likely to be the case, for instance, where the Authority perceives weaknesses in aspects of the control environment or high-level governance framework. Remedial action, such as requiring a strengthening in risk management, applying/tightening internal limits, strengthening the level of provisions and reserves or improving internal controls will be called for where judged appropriate by the Authority.

Determining the regulatory capital figure

8. Differentiated capital requirements may be set between the bank and the consolidated group to help ensure a prudent distribution of capital and that the risks in subsidiaries that are not themselves subject to solo capital requirements are properly mitigated. The Authority may also differentiate between the requirements it sets for the different banking groups/sub-groups it supervises, reflecting its assessment of the inherent risks in the business of each institution and the way these are managed.

9. In prescribing the minimum level of capital a bank is required to maintain, the Authority sets a ratio that banks must maintain between the amount of capital determined as the outcome of the Pillar 1 calculation and the total required regulatory capital figure. This is explained, with an example, in Annex 3.3.

The Capital Assessment and Risk Profile (CARP): Considerations for Banks

Documenting the CARP procedures

10. Bearing in mind the general approach described above and the intention to be proportionate, it is inappropriate to prescribe a "one size fits all" approach that firms must follow.

11. However, it may be helpful to provide some guidance as to what management should cover in a well structured, comprehensive document.

12. The prime expectation is that a CARP document should provide a relatively high level overview while containing enough detail to enable the Board and the Authority to obtain sufficient insight into the analysis undertaken and procedures that are in place to be able to understand and if necessary challenge them**.**

13. The Authority expects banks to revisit and revise where necessary their CARP documents on at least an annual basis.

Additional guidance and a suggested template

14. Further guidance, including a suggested template of a CARP document, is contained in Annex 3.1. This is intended to help make discussion of the CARP between the bank and the Authority as straightforward as possible.

Establishing the risk profile

15. The key challenge for management is to satisfy itself, and the Authority, that it has in place comprehensive procedures for identifying, assessing and mitigating risk and ensuring that these are effectively linked into the high level risk appetite and the capital and strategic planning processes. Many of the elements should already be incorporated in existing policies and procedures; some elements may be more formally documented than others. A useful starting point for management in establishing its risk profile might be to undertake a gap analysis to establish what additional work needs to be undertaken (and by whom) to bring existing documentation and procedures up to the required standard-including where necessary introducing new controls.

16. It is particularly important to document clearly the full list of potential risks faced by the group, and how material these are perceived to be, by each material legal entity and/or business line depending on how complex the organizational structure is. For example, where a bank has a matrix management structure responsible for business lines across legal entities, it may need to identify its material risks on both a business line and legal entity basis.

17. Below is a menu (and brief description) of what are generally accepted to be among the generic types of risk that banks are likely to face and need to consider under Pillar 2. Banks that are members of bigger, more complex groups are likely to face a greater range of these risks than banks whose business is more straightforward.

Risk menu:

i Credit risk: the unforeseen loss that might crystallize (and potentially impact capital) from a counterparty failing to meet an agreed contractual obligation – including settlement risk. Primarily addressed under the Pillar 1 calculation (and by robust internal limit setting and monitoring procedures).

ii Market risk: the risk to earnings and capital from adverse movements in asset prices / exchange rates on trading book activities. Primarily addressed under Pillar 1.

iii Operational risk: potential losses arising from inadequate or failed internal procedures and controls – including people and systems – or from external events. Legal risk (including potential regulatory/compliance costs arising from failure to meet prescribed rules or Codes of Conduct etc) are included here. A detailed

description of the wide range of events that should be considered and how operational risk should be addressed is contained in the Authority's May 2007 policy paper, The Management of Operational Risk. These risks will be covered, at least partially, by the Pillar 1 capital charge.

iv Concentration risk: any large (e.g. over 10% of capital / earnings) credit exposure to connected counter parties; product/ instrument type; sectors; countries or geographical area; single customer type (e.g. high net-worth individuals) where correlations exist that could result in otherwise unexpected material risks crystallizing.

v Liquidity risk: a potentially major risk is that banks will be unable to meet their liabilities as they fall due.

vi Interest rate risk (in the banking book): the potential for earnings and capital to be damaged by losses and falls in asset prices arising from adverse movements in interest rates.

vii Business/Strategic risk: includes the risk that strategic business decisions prove to be ill-founded or poorly executed (e.g. acquisitions; moves into new markets, products, or regions; changing the operating model), or there is a failure to anticipate/react to a more general shift in the economic environment, demographics etc.

viii Reputational risk: the adverse impact on earnings (and/or access to liquidity/ capital) that could result from a change in how a group is perceived by shareholders/counter parties/market exchanges/regulators/customers/governments.

ix Pension obligation or retirement health benefit risk: primarily an issue for firms with long-term obligations to funded defined benefit arrangements where short-term changes in asset prices or changes in underlying longer-term assumptions (e.g. longevity) can significantly increase the funding commitment.

x Residual risk: the potential that credit risk mitigation techniques (used to reduce the Pillar 1 capital calculation) prove less effective when tested than expected - including inadequate/late/non-standard documentation of innovative transactions such as structured credit derivatives.

xi Securitization risk: the possibility that a securitization undertaken will be structured in a way that it fails to remove as much risk from the balance sheet as expected (and provided for under the Pillar1 calculation).

xii Insurance risk: this relates to the inherent uncertainty as to when insurance liabilities that exist within any insurance subsidiaries within a banking group could crystallize.

18. Some risks in this list overlap so care should be taken to avoid double-counting when evaluating a risk profile. A good example of this is reputational risk. The likelihood is that any change in perception would result from one or more of the other risks in the list crystallizing and becoming known to external stakeholders.

19. Equally, no such illustrative list can be relied upon to be totally exhaustive. Management need to consider if there are any other inherent risks that need to be addressed (e.g. does the firm's internal risk register presented to its Audit Committee raise additional issues which are less generic - e.g. key person risk).

Materiality

20. While it is essential that all risks faced by the group are addressed by its CARP procedures, it is equally important that it can distinguish and be able to explain those it believes to be material and how each of them is mitigated. In assessing materiality, management is likely to want to measure the impact of a risk crystallizing against a variety of benchmarks such as capital, earnings, reputational damage, impact on customer confidence, share price/market rating and the implications for the availability/cost of funding.

21. Not all risks can be quantified easily. Where that is the case, it is important that management describes in the CARP document the approach it has adopted to assess whether a risk is material or not.

Stress and scenario testing

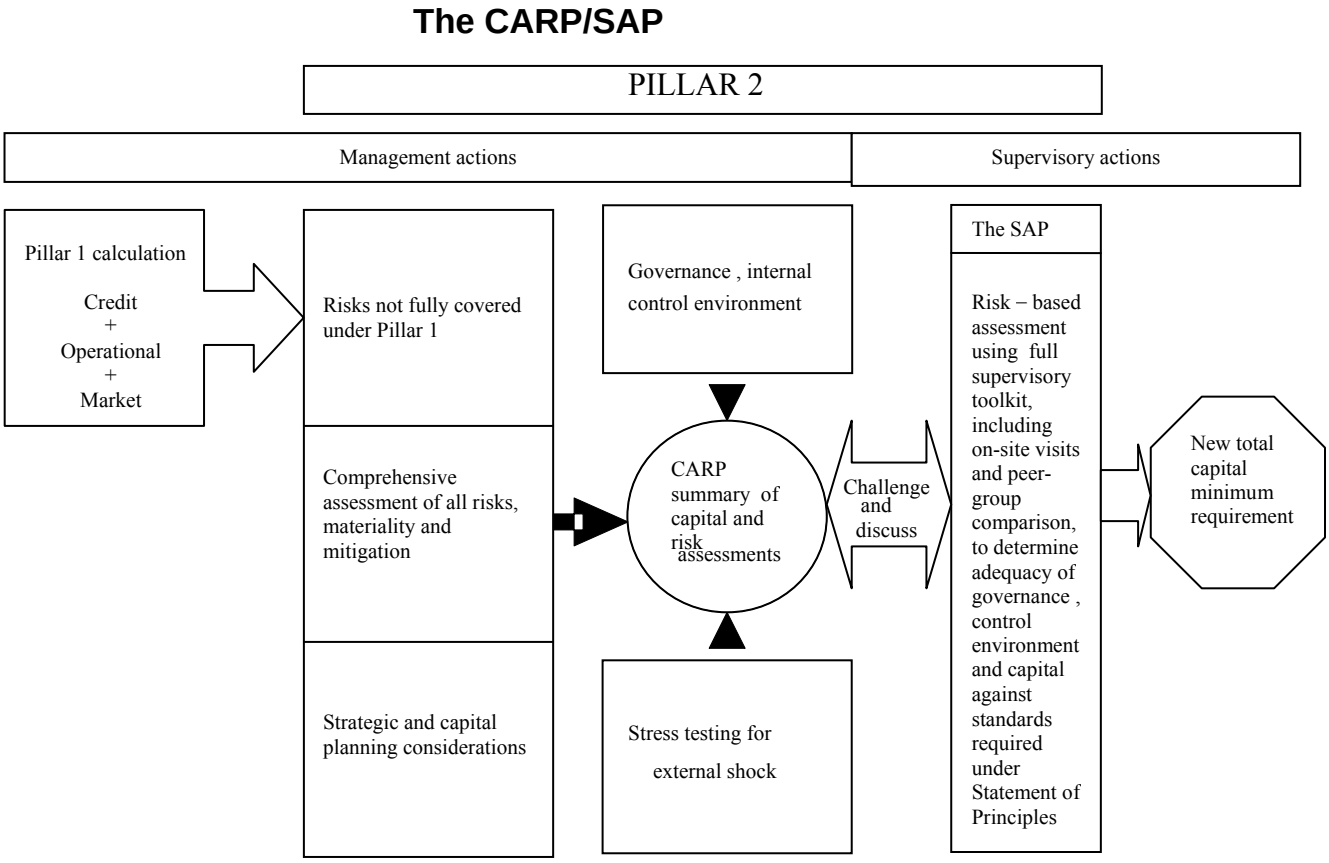
22. As well as having comprehensive procedures for assessing material risks, the Authority also expects bank management to be able to demonstrate that it is mindful of the particular stage of the business cycle in which the bank is operating. This requires management to have in place procedures to undertake, review and, where appropriate, react to the results of rigorous, forward-looking stress testing that identifies possible events or cyclical changes in market conditions that could adversely impact the bank's earnings, liquidity or asset values. More detail is contained in paragraph 28 iii.

The Supervisory Assessment Process (SAP)

23. The focus of the Authority's SAP is an evaluation of the effectiveness of a bank's high level governance arrangements and how good management is at assessing their capital needs relative to their risks.

The CARP/SAP interaction

24. A schematic showing the interaction between the CARP and the SAP is set out below.



Further details of how this works in practice are set out below. A summary of the supervisory "toolkit" that the Authority uses in its SAP is set out in Annex 3.2. It includes a reference to the Authority's approach to "home/host" issues that are relevant to firms that are part of overseas groups or where the Authority is the lead supervisor for an international group.

What the Authority looks for during the SAP

25. Supervision is not an exact science. It has always involved a mix of quantitative and qualitative judgments. Pillar 2 brings some of these more qualitative elements, particularly regarding the range of potential risks that banks are likely to need to address and attempt to measure, more explicitly into the supervisory process.

26. It requires bank management to undertake regularly (at least once a year) a comprehensive risk assessment and document the results. Some guidance on the Authority's expectations when reviewing the results of those periodic assessments and how they were derived is set out below.

Governance and capital planning

27. A sound and effective governance structure is the foundation for an accurate assessment of an institution's risk profile and how best this can be managed in relation to the adequacy of its current and future capital position and strategic business plan. An assessment of the robustness of the governance and capital planning arrangements in place is a major factor in determining the eventual regulatory capital requirement set by the Authority under the new Pillar 2 framework. In making this assessment supervisors look in particular for evidence that:

i a strategic plan exists that clearly outlines the bank's capital needs, anticipated capital expenditures, desirable capital level, and external capital sources.

ii senior management have an effective framework for assessing the various risks facing the business and relating those risks to the bank's capital needs.

iii the Board actively encourages a strong internal control culture through its approach, underpinned by written policies and procedures.

iv management effectively communicates and implements its policies and procedures throughout the group.

v there is a regular, risk-based programme of monitoring compliance with internal policies. This should include independent review and the involvement of internal and external auditors as part of an ongoing programme to enable the Board to monitor compliance with, and assess the ongoing adequacy of, its internal policies and procedures.

vi management information systems are fit for purpose**.** They should enable bank management to monitor and control material risk exposures and report these to the Board and other relevant parties. These reports should be produced regularly and contain sufficient detail to enable senior management and the Board to:

- a evaluate the level and trend of material risks and their effect on capital levels;
- b evaluate the sensitivity and reasonableness of key assumptions used in the capital assessment measurement system;
- c determine that the bank holds sufficient capital against the various risks and is in compliance with established capital adequacy goals; and
- d assess its future capital requirements based on the bank's reported risk profile and make necessary adjustments to the bank's strategic plan accordingly.

The risk profile and mitigation

28. To be satisfied that a bank's CARP procedures are comprehensive, the Authority expects to see evidence that at least the following potentially significant risks have been appropriately addressed by management:

i risks that may not have been fully covered under the Pillar1 calculation

a *credit risk*

Not all aspects of credit risk may be fully captured by the Pillar 1 capital calculation. This is particularly likely to be the case where:

- there is a lack of diversification in the business; and/or
- risk mitigation techniques (including securitization; the use of credit derivatives ; as well as more "traditional" techniques such as cash collateral) prove, in the event , not to be as effective or robust as has been expected in calculating Pillar1 offsets.

a(i) *Lack of diversification*

As noted earlier, the Pillar1 framework is predicated on the assumption that it delivers a reasonable measure of the minimum amount of risk capital that a "well diversified " bank – by geography, customer-type, product range - needs to hold for regulatory purposes. Given the nature of the business undertaken by banks in Bermuda, the Authority is minded to conclude that the full diversification benefits built into the Basel methodology are unlikely to be appropriate when the Authority sets its capital requirements. This is likely to mean that an additional amount of capital over the Pillar1 minimum will be required – to be determined on a case by case basis –to take this relative lack of diversification into account. Management should consider how best to address this in their own internal capital adequacy assessments.

a(ii) R*esidual risks arising from ineffective credit risk mitigation (CRM) techniques*

Credit risk mitigants can be flawed and deliver less actual protection against loss than provided for in the Pillar1 calculation. Examples of potential flaws include:

- inability to realize in a timely manner collateral pledged (on default of the counterparty);
- refusal or delay by a guarantor to pay; and
- ineffectiveness of untested documentation.

These risks are addressed in the sections on credit risk mitigation and securitisation which set out the strict criteria that banks need to meet before they are permitted to take account of these techniques in calculating regulatory capital.

Where the Authority is not satisfied as to the robustness, suitability or application of the mitigants in place, it may require a bank to take a reduced offset for particular mitigants (on the whole credit portfolio or by specific product line) in calculating its Pillar1 capital. Or it could require a specific additional amount of capital to be held under Pillar 2; or combine the above together with other remedial action it judges appropriate for management to implement.

b *Operational risk*

For banks adopting The Standardized Approach (TSA) under Pillar 1, gross income is only a broad proxy for the scale of operational risk exposure facing the institution. It is unlikely that this measure provides an accurate reflection of the actual operational loss experience. In some cases (e.g. for banks with low margins, or those going through a significant period of change/restructuring) it might underestimate the amount of capital needed to protect against operational risk. It is, of course, equally possible that the past record of operational losses – where sufficient, reliable data have been collected by the firm to measure them accurately – would justify a lower operational risk charge than generated under the pillar 1 calculation.

A summary of the operational risk experience should be included in the CARP document together with management's conclusions on the adequacy of the Pillar1 capital figure (bearing in mind the need to be forward as well as backward looking). If management make the case that the Pillar 1 figure is excessive, the Authority takes into account the robustness of the operational risk monitoring systems in place and, allied to that, the quantity and quality of data that management have used to reach that decision. In reaching a decision on whether to agree to a reduction under Pillar 2 the Authority also takes into account the experiences/expectations of other banks of similar size and with similar operations.

c market risk

As with credit risk, the Pillar1 market risk requirements are designed for large, international banks with well diversified trading book activities. The current business profile of Bermudian banks does not conform to that model. Market risk accounts for only a small proportion of the total risk profile of local banks. While that remains the case, it continues to be measured for regulatory purposes within the risk measurement rules applied to the banking book.

Unless a bank's strategic plans reveal a significant shift towards more trading-book type activities and/ or it seeks the Authority's approval to use internal VaR models it is unlikely the Authority will see a need for a market risk add-on under Pillar 2.

Any bank wishing to change its market risk profile materially should approach the Authority to discuss its thinking and the likely implications well in advance.

ii risks not covered at all under Pillar 1

Banking groups potentially have a wide range of risks embedded in their business that could potentially pose a material risk to depositors unless properly identified and mitigated – either by holding capital against them or by enhanced controls. Some examples of the risks Bermudian banks are most likely to face that are outside the scope of Pillar 1, that should be considered in the CARP and the results appropriately documented, include:

a C*oncentration risk*:

As well as lacking full diversification in their activities (see above), it is clear that particular risk concentrations can and do exist in the assets, liabilities, and off-balance sheet activities of local banks. The most likely concentrations are likely to be in credit risk – including sectoral, country, and settlement risks. (Risk concentrations can also arise from a reliance upon limited funding sources; this risk is covered under the liquidity risk procedures (see below)).

Large credit concentrations are not addressed in the Pillar 1 capital charge even though experience shows that they are arguably the single most important cause of major problems in banks. The Authority's existing large exposure requirements are designed to help mitigate that risk and the threat it poses to depositors.

As a result, banks should have in place effective internal policies, systems and controls to identify, measure, monitor, and control their material risk concentrations (including sectoral and geographic). When preparing their CARP document management should summarize these concentrations. The Authority also expects a bank's management to conduct periodic stress tests of its major credit risk concentrations. The Authority will review the results of those stress tests.

If management identifies other forms of material concentrations these should be highlighted in the CARP document. Failure to have adequate controls and limits in place to enable management to actively monitor and manage large concentrations of risk will result in corrective action being considered by the Authority.

b *Interest rate risk in the banking book*:

Interest rate risk in the banking book is a potentially significant risk for banks which should be addressed under Pillar 2. The policy requirements the Authority introduced in 2007 are designed to ensure that institutions take proper steps to address this risk ('The Monitoring and Control of Interest rate Risk', May 2007). They recognize that banks' internal systems are the principal tool for the measurement and control of interest rate risk in the banking book.

As part of its SAP the Authority will expect to find (in the CARP document and any supporting documentation) evidence that the approach taken to interest rate risk includes all material interest rate positions of the bank and is fully consistent with the Authority's detailed requirements (including stress testing for a 200 basis point shift in the yield curve).

If the Authority determines that a bank is not holding capital commensurate with the level of its interest rate risk it is likely to require corrective action by management - including reducing the risk profile; holding a specific amount of additional capital; or some combination of the two.

c *Liquidity risk*:

Access to sufficient liquidity is crucial to the ongoing viability of any banking organization. When undertaking trading activities banks should also be mindful of the liquidity of those markets and their ability to close out positions quickly (and at what cost). Liquidity risk is a good example of a Pillar 2 exposure that is unlikely to be adequately mitigated simply by holding additional capital - although banks' capital positions can have an effect on their ability to obtain liquidity, especially in a crisis. The priority, when addressing liquidity risk, is for each bank to have in place adequate systems for measuring, monitoring and controlling its liquidity consistent with the parameters set down by the Authority (see "The Measurement and Monitoring of Liquidity", May 2007). Rigorous stress testing is an important element in this process.

Failure to meet the Authority's requirements will trigger discussions with the Board on the development of the institution's business and the appropriateness of the liquidity framework it has in place.

d *Reputational risk:*

The potential adverse impact of a loss of market or customer confidence, particularly in times of relative stress, on liquidity and/or capital, that could result from reputational damage/adverse publicity - whether well-founded in

fact or not - is a significant risk to any banking group. An important part of the SAP is to assess whether the Board can demonstrate that it has in place processes that ensure it will be alerted promptly and will be able to react accordingly to such risks as they begin to materialize. It is particularly important that this includes an ability to identify and deal with a combination of risks that of themselves may not appear material but which collectively could lead to significant reputational damage. One way of doing so would be through the existence of a strong Risk Committee accountable to the Board. An effective Audit Committee would also have a role to play.

e *Pension fund risk***:**

Groups that have defined benefit pension arrangements should be able to demonstrate to the Authority (e.g. by summarizing the key facts in its CARP document) the approach they have taken to quantifying their current / future funding commitments , taking into account potential changes in such factors as life expectancy. This should include both contractual and moral commitments which management, their advisors and the fund trustees determine may face the bank. Where a funding deficit is identified to exist over and above the "normal" level of contributions and poses a material risk to future profitability of the bank/group, that sum should be provided for as a Pillar 2 capital buffer. Management may determine that sum either by using the measure under IFRS or some other measure, agreed with the fund trustees, to determine the amount of cash the group would need to pay in over and above normal contributions in "the foreseeable future" – say the next 3 years. That figure should be reviewed at least annually and deducted from the capital base when determining capital resources available.

iii *external risks arising during a business cycle (stress and scenario testing)*

As noted above, supervisors expect to see evidence of stress testing at the level of some of the most significant individual risks covered above - e.g. large credit concentrations, interest rate risk in the banking book and liquidity risk. Those tests should be demonstrably proportionate in relation to the complexity of the risks incurred. Such testing typically might embrace the impact of movements in asset prices; interest rates; other relevant economic variables; or even changes in the behaviour of major competitors/customers in key markets or product offerings that would, for instance, need a response to protect market share/strategic imperatives. The results should be summarized in the CARP document (detailed results should be appended or be available to the Authority on request).

As well as these risk specific stress-tests the Authority also expects management to undertake more general scenario testing that estimates the impact of a combination of factors at different stages in the business cycle on its ability to meet regulatory capital and liquidity requirements. These assessments need not be overly

sophisticated but should extrapolate historical events and consider a range of options as to the depth/severity of events in both the domestic market and on any material activities undertaken globally.

Bearing in mind the significance of property and related exposures to the local economy and the balance sheets of local banks, one scenario that management should consider would be the impact of a shock to the income stream in that sector. Other scenarios, which have the potential for high impact but relatively low probabilities of crystallizing, would consider the impact of a sharp downturn in Bermuda's international business sector, with consequential impact on the rest of the economy and, in particular, the property sector; or a recession in tourist business. Banks with overseas operations should also consider the impact of a severe global recession or disruption to the US economy and/or financial markets.

The intention is to help management and the Authority assess the potential vulnerabilities of the business (and hence of depositors) to exceptional, but plausible events. It is for management to explain which scenario it has taken as its "central" scenario for the purposes of its capital planning.

Calculating and Reporting Regulatory Capital under Basel II

29. The increased granularity required under Pillar 2 in relating risk to capital, plus the introduction of an operational risk charge related to gross income provides the basis for the Authority to derive differentiated minimum capital requirements reflecting the risk profile, governance and internal control arrangements within each banking group.

30. The Authority sets a ratio unique to each bank that relates the total regulatory capital figure set by the Authority under its Pillar 2 SAP to the "base" capital figure that is derived from the Pillar 1 Standardized Approach calculation. This approach assumes that (other than in exceptional circumstances) banks only update their internal CARP assessment annually. Linking the Pillar 1 and Pillar 2 capital figures in this way ensures that there is a dynamic relationship between the risks in the business as measured by the Pillar 1 base capital level – which needs to be calculated and reported to the Authority quarterly – and the total 'target' capital level that a bank must meet at all times to address the combined Pillar 1 and Pillar 2 risks.

31. The move from Basel I to Basel II at the beginning of 2009 requires some transitional arrangements. These are set out in Annex 3.3, which also illustrates how the Authority sets minimum capital levels under this framework and the form in which they are communicated to individual institutions.

Part 4

Pillar 3 – Market Discipline

Introduction

1. Market discipline is the term that describes the monitoring and control of an institution's management by outside stakeholders to ensure that it acts in their best interests. By monitoring the activities of the institution and responding accordingly, stakeholders influence the behaviour of the institution and discourage it from taking actions damaging to their interests. If this is to work effectively, the market must receive frequent, relevant, and meaningful information about an institution's risk management strategies and operations. Enhanced disclosure is therefore an important part of the new capital adequacy framework.

Overview and Scope

2. The Authority's approach, which is fully in line with the Basel II framework, is intended to encourage institutions to capitalize on modern risk management techniques, and to establish a more risk responsive linkage between their operations and capital requirements. The approach also provided a strong incentive for institutions to improve their risk management systems.

   The purpose of Pillar 3 – market discipline is to encourage market discipline by developing a set of disclosure requirements which allow market participants to assess key pieces of information on the scope of application, capital, risk exposures, risk assessment processes, and hence the capital adequacy of the institution. The enhanced transparency is intended to strengthen market discipline by providing a common, consistent framework for assessing and comparing the underlying risks to which banks are exposed.

   Pillar 3 is applicable to all Bermuda licensed banks and deposit companies as well as those investment businesses which have agreed with the Authority that they should fall within the scope of the new capital framework. In the rest of this paper, all references to banks should be taken as including relevant investment businesses.

   Where a bank is part of a group, the disclosure requirements apply at the top consolidated level. Individual banking entities within the group need only disclose details of their tier 1 and total capital and their total Pillar 1 capital charge (although overseas entities will, of course, have to comply with any local disclosure requirements). However, the Authority will still have the discretion to require additional disclosure at a sub-consolidated level, especially in the case of banks

which are part of an international group which is already subject to similar disclosure requirements at the top consolidated level.

As a general point, the disclosure requirements are tailored to reflect the nature, size and complexity of an institution. Accordingly, smaller and or less complex institutions will only be required to disclose certain relevant parts of Pillar 3 requirements. Institutions should refer to the Authority where they are uncertain about how Pillar 3 applies to them.

Guiding Principles

3. The following principles are intended to assist institutions better to understand some of the issues that the Authority considers essential to effective implementation of Pillar III:
   - **Greater disclosure is intended to promote greater transparency and market discipline of an institution's risk management policies and procedures.**
   - **An institution should have in place a formal disclosure policy approved by the board which outlines fully its approach to market discipline. At a minimum, this should cover the disclosures to be made, the internal controls over the disclosure process, the frequency and location of disclosures and the arrangements for ensuring their accuracy.**
   - **A formal disclosure policy should include a methodology for reviewing the effectiveness of the policy.**
   - **An institution's public disclosures should include consideration of all its risks in a consistent manner and link risk to capital requirements,**
   - **Disclosures should be consistent with how senior management and the board of directors assess and manage risk.**
   - **Disclosures should not conflict with established accounting requirements.**
   - **Whenever possible, all required disclosures should be in one place. Disclosures do not have to be in an institution's financial statements but, where not, these should contain a reference as to where the material may be found.**
   - **Prudential disclosures should be in full in an easily identifiable location. The Authority recommends the use of a company's website as the primary place for all its public disclosures. The Authority should be informed of any alternative methods of disclosure which should be clearly identified and easily accessible by the market.**
   - **Certain required prudential accounting disclosures may, in part, serve to meet required supervisory disclosures.**
   - **Pillar 3 disclosures are not required to be audited by an external auditor. However the methodology used must be consistent with that used for its audited disclosures.**

- **Institutions should decide what constitutes relevant disclosures based on the materiality concept[15].**
- **In general institutions should publish material information as soon as practicable**.

Compliance with Pillar 3

4. The Authority expects licensed institutions to take early steps to implement Pillar 3 requirements that are appropriate to their business, and to maintain an ongoing review of the adequacy of their disclosures. Institutions should include Pillar 3 in their Basel II implementation plans and, as part of this, should prepare for the potential reaction of stakeholders to the publication of large amounts of previously unpublished information. For its part, the Authority will monitor closely the policies developed by licensed institutions in that regard, as well as the effectiveness of their implementation. Where it has concerns as to the appropriateness or completeness of disclosures, these will be discussed with the institution's senior management and Board, normally in the context of the Supervisory Assessment Process. Discussions may also involve the institution's external auditors. In general all required disclosures should be made within 40 business days after the end of the period to which they relate. Where there is doubt or uncertainty on a particular issue institutions are required to seek further assistance from the Authority. Issues of non compliance will be addressed by the Authority.

Frequency of Disclosures

5. The Authority's normal expectation is that most disclosures will be made on a semi-annual basis. However, the Authority is willing to adopt a flexible approach and will be prepared to discuss with individual institutions the frequency of disclosures. For example, while it may be appropriate for most quantitative disclosures to be made on a semi-annual basis, basic information covering tier 1 capital, total capital and total required capital might be provided on a quarterly basis. Qualitative disclosures, on the other hand, such as general information on an institution's risk management objectives and associated policies and procedures might be made less frequently, for example on an annual basis. Institutions will be required to keep the effectiveness of their disclosures, including frequency, under ongoing review. The Authority reserves the right to adjust an institution's frequency and timing of disclosures and or require any additional disclosures that it may deem appropriate to meet the intent of this market disclosure policy.

[15] Information would be regarded as material if its omission or misstatement could change or influence the assessment or decision of a user relying on that information for the purpose of making economic decisions.

Proprietary and confidential information

6. There is no intention under Pillar 3 to impose on banks a single standard disclosure obligation. Further, it is not the intention of the Authority to require an institution to publicly disclose any information that might put it at a competitive disadvantage or disclose confidential customer information. The Authority believes that the requirements set out below strike an appropriate balance between the need for meaningful disclosure and the protection of proprietary and confidential information. Where an institution believes that the release of certain prudential information might adversely affect it, management should discuss their concerns with the Authority with a view to determining whether an alternative disclosure of more general information may be possible. In any such case, the institution may have to disclose both the omission and the reason for it. In general these matters will be dealt with on a case by case basis.

Disclosure Requirements

7. The following sections set out in tabular form the Authority's public disclosure requirements under Pillar 3. There is no obligation to complete the table although institutions may find it helpful to do so. Equally, institutions are free to use a different format for their disclosures provided that all of the required information is included. Note that the table is intended to establish minimum disclosure requirements (although institutions are free to publish more if they wish). Institutions should therefore stand ready to justify any decision not to disclose in line with these requirements, whether on materiality or other grounds. It is recommended that disclosures be shared with the Authority prior to the information being published.

   Disclosures under Pillar 3 must be validated. The Authority is not requiring external audit. Instead, it will be the responsibility of a licensed entity to ensure that the required prudential disclosures are appropriately verified for their reliability and consistency with any previously released information. The Authority requires that an institution's Chief Executive Officer or other appropriate senior manager should attest to the reliability of the information disclosed.

** *Please note that the paragraph references in the tables refer to the original Basel recommendations entitled:* *Basel II: International Convergence of Capital Measurement and Capital Standards: a Revised Framework which can be accessed via the Bank for International Settlement (BIS) website.*

PILLAR 3 DISCLOSURES			Disclosure Provided				Frequency				Location of Disclosure**
			Yes	No	N/A	If No or N/A reason disclosure not provided	Annual	Qrtly	Semi A	If other provide details	
Table 1 - Scope of application											
Qualitative Disclosures	a)	The name of the top corporate entity in the group to which the Framework applies									
	b)	An outline of differences in the basis of consolidation for accounting and regulatory purposes, with a brief description of the entities[1] within the group									
		(a) that are fully consolidated[2];									
		(b) that are pro-rata consolidated[3];									
		(c) that are given a deduction treatment;[4] and									
		(d) from which surplus capital is recognised plus									
		(e) that are neither consolidated nor deducted (e.g. where the investment is risk-weighted).									
	(c)	Any restrictions, or other major impediments, on transfer of funds or regulatory capital within the group.									
Quantitative Disclosures	(d)	The aggregate amount of surplus capital of insurance subsidiaries (whether deducted or subjected to an alternative method[5]) included in the capital of the consolidated group.									
	(e)	The aggregate amount of capital deficiencies[6] in all subsidiaries not included in the consolidation i.e. that are deducted and the name(s) of such subsidiaries.									

** Provide details (e.g., financial statements, MD&A, website) and page reference where applicable.

1 Entity = securities, insurance and other financial subsidiaries, commercial subsidiaries, significant minority equity investments in insurance, financial and commercial entities.

2 Following the listing of significant subsidiaries in consolidated accounting, e.g. accounting for consolidated and separate financial statements/subsidiaries

3 Following the listing of subsidiaries in consolidated accounting, e.g. accounting for investments/interests in joint ventures.

4 May be provided as an extension (extension of entities only if they are significant for the consolidating bank) to the listing of significant subsidiaries in consolidated accounting, e.g. accounting for consolidated and separate financial statements/ and accounting for investments/interests in joint ventures .

5 See paragraphs 30 and 33.

6 A capital deficiency is the amount by which actual capital is less than the regulatory capital requirement. Any deficiencies which have been deducted on a group level in addition to the investment in such subsidiaries are not to be included in the aggregate capital deficiency.

PILLAR 3 DISCLOSURES			Disclosure Provided				Frequency				Location of Disclosure**
			Yes	No	N/A	If No or N/A reason disclosure not provided	Annual	Qrtly	Semi A	If other provide details	
	(f)	The aggregate amounts (e.g. current book value) of the firm's total interests in insurance entities, which are risk-weighted[7] rather than deducted from capital or subjected to an alternate group-wide method[8], as well as their name, their country of incorporation or residence, the proportion of ownership interest and, if different, the proportion of voting power in these entities. In addition, indicate the quantitative impact on regulatory capital of using this method versus using the deduction or alternate group-wide method.									
Table 2 - Capital structure											
Qualitative Disclosures	(a)	Summary information on the terms and conditions of the main features of all capital instruments, especially in the case of innovative, complex or hybrid capital instruments.									
Quantitative Disclosures	(b)	The amount of Tier 1 capital, with separate disclosure of:									
		• paid-up share capital/common stock;									
		• reserves;									
		• minority interests in the equity of subsidiaries;									
		• innovative instruments;[9]									
		• other capital instruments;									
		• surplus capital from insurance companies;[10]									
		• regulatory calculation differences deducted from Tier 1 capital; and									
		• other amounts deducted from Tier 1 capital,									

[7] See paragraph 31.
[8] See paragraph 30.
[9] Innovative instruments are covered under the Committee's press release, Instruments eligible for inclusion in Tier 1 capital (27 October 1998).
[10] See paragraph 33.

PILLAR 3 DISCLOSURES			Disclosure Provided				Frequency				Location of Disclosure**
			Yes	No	N/A	If No or N/A reason disclosure not provided	Annual	Qrtly	Semi A	If other provide details	
		including goodwill and investments.									
	(c)	The total amount of tier 2 and tier 3 capital.									
	(d)	Other deductions from capital.									
	(e)	Total eligible capital									
Table 3 - Capital adequacy											
Qualitative Disclosures	(a)	A summary discussion of the bank's approach to assessing the adequacy of its capital to support current and future activities.									
Quantitative Disclosures	(b)	Capital requirements for credit risk:									
		• Portfolios subject to standardised, disclosed separately for each portfolio;									
		• Corporate (including SL not subject to supervisory slotting criteria), sovereign and bank;									
		• Residential mortgage;									
		• Qualifying revolving retail;[11] and									
		• Other retail;									
		• Securitization exposures									
	(c)	Capital requirements for market risk:									
		• Standardised approach;									
	(d)	Capital requirements for operational risk :									
		• Standardised approach;									
	(e)	Total and Tier 1[12] capital ratio:									
		• For the top consolidated group; and									
		• For significant bank subsidiaries (stand alone or									

[11] Banks should distinguish between the separate non-mortgage retail portfolios used for the Pillar 1 capital calculation (i.e. qualifying revolving retail exposures and other retail exposures) unless these portfolios are insignificant in size (relative to overall credit exposures) and the risk profile of each portfolio is sufficiently similar such that separate disclosure would not help users' understanding of the risk profile of the banks' retail business.

[12] Including proportion of innovative capital instruments.

PILLAR 3 DISCLOSURES				Disclosure Provided				Frequency				Location of Disclosure**
				Yes	No	N/A	If No or N/A reason disclosure not provided	Annual	Qrtly	Semi A	If other provide details	
			sub-consolidated depending on how the Framework is applied).									
Table 4[13] - Credit risk: general disclosures for all banks												
Qualitative Disclosures	(a)	The general qualitative disclosure requirements (paragraph 824) with respect to credit risk, including:										
		•	Definitions of past due and impaired (for regulatory accounting purposes);									
		•	Description of approaches followed for specific and general allowances and statistical methods;									
		•	Discussion of the bank's credit risk management policy; and									
		•	A description of the nature of exposures within each portfolio that are subject to the standardised approach, description of any plans for moving to advanced methodologies to be taken to migration of existing exposures and timing for migrating exposures.									
Quantitative Disclosures	(b)	Total gross credit risk exposures, plus average gross exposure over the period broken down by major types of credit exposure. [14]										
	(c)	Geographic distribution of exposures, broken down in significant areas by major types of credit exposure.										
	(d)	Industry or counterparty type distribution of exposures, broken down by major types of credit exposure.										
	(e)	Residual contractual maturity breakdown of the whole portfolio, broken down by major types of credit										

[13] Table 4 does not include equities.

[14] This breakdown could be that applied under accounting rules, and might, for instance, be (a) loans, commitments and other non-derivative off balance sheet exposures, (b) debt securities, and (c) OTC derivatives.

PILLAR 3 DISCLOSURES			Disclosure Provided				Frequency				Location of Disclosure**
			Yes	No	N/A	If No or N/A reason disclosure not provided	Annual	Qrtly	Semi A	If other provide details	
		exposure.									
	(f)	By major industry or counterparty type:									
		• Amount of impaired loans and if available, past due loans, provided separately;[15]									
		• Specific and general allowances; and									
		• Charges for specific allowances and charge-offs during the period.									
	(g)	Amount of impaired loans and, if available, past due loans provided separately broken down by significant geographic areas including, if practical, the amounts of specific and general allowances related to each geographical area.									
	(h)	Reconciliation of changes in the allowances for loan impairment.									
	(i)	For each portfolio, the amount of exposures subject to the standardised approach									
Table 5 - Credit risk: disclosures for portfolios subject to the standardized approach.											
Qualitative Disclosures	(a)	For portfolios under the standardised approach:									
		• Names of ECAIs and ECAs used, plus reasons for any changes;									
		• Types of exposure for which each agency is used;									
		• A description of the process used to transfer public issue ratings onto comparable assets in the banking book; and									
		• The alignment of the alphanumerical scale of each agency used with risk buckets.[16]									

[15] Banks are encouraged also to provide an analysis of the ageing of past-due loans.
[16] This information need not be disclosed if the bank complies with a standard mapping which is published by the relevant supervisor.

PILLAR 3 DISCLOSURES				Disclosure Provided				Frequency				Location of Disclosure**
				Yes	No	N/A	If No or N/A reason disclosure not provided	Annual	Qrtly	Semi A	If other provide details	
Quantitative Disclosures	(b)	•	For exposure amounts after risk mitigation subject to the standardised approach, amount of a bank's outstandings (rated and unrated) in each risk bucket as well as those that are deducted.									
Table 6 - Credit risk mitigation: disclosures for standardised approach.[17,18]												
Qualitative Disclosures*	(a)	The general qualitative disclosure requirement (paragraph 824) with respect to credit risk mitigation including:										
		•	policies and processes for, and an indication of the extent to which the bank makes use of, on- and off-balance sheet netting;									
		•	policies and processes for collateral valuation and management;									
		•	a description of the main types of collateral taken by the bank;									
		•	the main types of guarantor/credit derivative counterparty and their creditworthiness; and									
		•	information about (market or credit) risk concentrations within the mitigation taken.									

[17] At a minimum, banks must give the disclosures below in relation to credit risk mitigation that has been recognised for the purposes of reducing capital requirements under this Framework. Where relevant, banks are encouraged to give further information about mitigants that have not been recognised for that purpose.

[18] Credit derivatives that are treated, for the purposes of this Framework, as part of synthetic securitisation structures should be excluded from the credit risk mitigation disclosures and included within those relating to securitisation.

PILLAR 3 DISCLOSURES			Disclosure Provided				Frequency				Location of Disclosure**
			Yes	No	N/A	If No or N/A reason disclosure not provided	Annual	Qrtly	Semi A	If other provide details	
Quantitative Disclosures*	(b)	For each separately disclosed credit risk portfolio under the standardised, the total exposure (after, where applicable, on- or off- balance sheet netting) that is covered by eligible financial collateral after the application of haircuts.[19]									
	(c)	For each separately disclosed portfolio under the standardised approach, the total exposure (after, where applicable, on- or off-balance sheet netting) that is covered by guarantees/credit derivatives.									
Table 7 - General disclosure for exposures related to counterparty credit risk (CCR).											
Qualitative Disclosures	(a)	The general qualitative disclosure requirement (paragraphs 824 and 825) with respect to derivatives and CCR, including:									
		• Discussion of methodology used to assign economic capital and credit limits for counterparty credit exposures;									
		• Discussion of policies for securing collateral and establishing credit reserves;									
		• Discussion of policies with respect to wrong-way risk exposures;									
		• Discussion of the impact of the amount of collateral the bank would have to have to provide given a credit rating downgrade.									
Quantitative Disclosures	(b)	Gross positive fair value of contracts, netting benefits, netted current credit exposure, collateral held (including type, e.g. cash, government									

[19] If the comprehensive approach is applied, where applicable, the total exposure covered by collateral after haircuts should be reduced further to remove any positive adjustments that were applied to the exposure, as permitted under Part 2.

PILLAR 3 DISCLOSURES			Disclosure Provided				Frequency				Location of Disclosure**
			Yes	No	N/A	If No or N/A reason disclosure not provided	Annual	Qrtly	Semi A	If other provide details	
		securities, etc.), and net derivatives credit exposure.[20] Also report measures for exposure at default, or exposure amount, under the SM method. The notional value of credit derivative hedges, and the distribution of current credit exposure by types of credit exposure.[21]									
	(c)	Credit derivative transactions that create exposures to CCR (notional value), segregated between use for the institution's own credit portfolio, as well as in its intermediation activities, including the distribution of the credit derivatives products used[22], broken down further by protection bought and sold within each product group.									
	(d)	The estimate of alpha if the bank has received supervisory approval to estimate alpha.									
Table 8 - Securitization: disclosure for the standardised approach.											
Qualitative Disclosures*	(a)	The general qualitative disclosure requirement (paragraph 824) with respect to securitisation (including synthetics), including a discussion of:									
		• the bank's objectives in relation to securitisation activity, including the extent to which these activities transfer credit risk of the underlying securitised exposures away from the bank to other entities;									

[20] *Net credit exposure* is the credit exposure on derivatives transactions after considering both the benefits from legally enforceable netting agreements and collateral arrangements. The notional amount of credit derivative hedges alerts market participants to an additional source of credit risk mitigation.

[21] This might be interest rate contracts, FX contracts, equity contracts, credit derivatives, and commodity/other contracts.

[22] This might be Credit Default Swaps, Total Return Swaps, Credit options, and other.

PILLAR 3 DISCLOSURES				Disclosure Provided				Frequency				Location of Disclosure**
				Yes	No	N/A	If No or N/A reason disclosure not provided	Annual	Qrtly	Semi A	If other provide details	
		•	the roles played by the bank in the securitisation process[23] and an indication of the extent of the bank's involvement in each of them; and									
		•	the regulatory capital approach that the bank follows for its securitisation activities.									
	(b)	Summary of the bank's accounting policies for securitisation activities, including:										
		•	whether the transactions are treated as sales or financings;									
		•	recognition of gain on sale;									
		•	key assumptions for valuing retained interests, including any significant changes since the last reporting period and the impact of such changes; and									
		•	treatment of synthetic securitisations if this is not covered by other accounting policies (e.g. on derivatives).									
	(c)	Names of ECAIs used for securitisations and the types of securitisation exposure for which each agency is used.										
Quantitative Disclosures*	(d)	The total outstanding exposures securitised by the bank and subject to the securitisation framework (broken down into traditional/synthetic), by exposure type.[24,25,26]										
	(e)	For exposures securitised by the bank and subject to the securitisation framework:										

[23] For example: originator, investor, servicer, provider of credit enhancement, sponsor of asset backed commercial paper facility, liquidity provider, swap provider.

[24] For example, credit cards, home equity, auto, etc.

[25] Securitisation transactions in which the originating bank does not retain any securitisation exposure should be shown separately but need only be reported for the year of inception.

[26] Where relevant, banks are encouraged to differentiate between exposures resulting from activities in which they act only as sponsors, and exposures that result from all other bank securitisation activities that are subject to the securitisation framework.

PILLAR 3 DISCLOSURES			Disclosure Provided				Frequency				Location of Disclosure**
			Yes	No	N/A	If No or N/A reason disclosure not provided	Annual	Qrtly	Semi A	If other provide details	
		• amount of impaired/past due assets securitised; and									
		• losses recognised by the bank during the current period[27]									
		broken down by exposure type.									
	(f)	Aggregate amount of securitisation exposures retained or purchased broken down by exposure type.									
	(g)	Aggregate amount of securitisation exposures retained or purchased broken down into a number of risk weight bands. Exposures that have been deducted entirely from Tier 1 capital, credit enhancing I/Os deducted from Total Capital, and other exposures deducted from total capital should be disclosed separately by type of underlying asset.									
	(h)	For securitisations subject to the early amortisation treatment, the following items by underlying asset type for securitised facilities:									
		• the aggregate drawn exposures attributed to the seller's and investors' interests;									
	(i)	Banks using the standardised approach are also subject to disclosures (g) and (h), and should use the capital charges for the standardised approach.									
	(j)	Summary of current year's securitisation activity, including the amount of exposures securitised (by exposure type), and recognised gain or loss on sale by asset type.									

[27] For example, charge-offs/allowances (if the assets remain on the bank's balance sheet) or write-downs of I/O strips and other residual interests.

PILLAR 3 DISCLOSURES			Disclosure Provided				Frequency				Location of Disclosure**
			Yes	No	N/A	If No or N/A reason disclosure not provided	Annual	Qrtly	Semi A	If other provide details	
Table 9 - Market risk: disclosures for banks using the standardised approach.											
Qualitative disclosures	(a)	The general qualitative disclosure requirement (paragraph 824) for market risk including the portfolios covered by the standardised approach.									
Quantitative disclosures	(b)	The capital requirements for:									
		• interest rate risk;									
		• equity position risk;									
		• foreign exchange risk; and									
		• commodity risk.									
Table 10 - Operational risk.											
Qualitative disclosures	(a)	In addition to the general qualitative disclosure requirement (paragraph 824), the approach(es) for operational risk capital assessment for which the bank qualifies.									
Table 11 - Equities: disclosures for banking book positions.											
Qualitative disclosures	(a)	The general qualitative disclosure requirement (paragraph 824) with respect to equity risk, including:									
		• differentiation between holdings on which capital gains are expected and those taken under other objectives including for relationship and strategic reasons; and									
		• discussion of important policies covering the valuation and accounting of equity holdings in the banking book. This includes the accounting techniques and valuation methodologies used, including key assumptions and practices affecting valuation as well as significant									

PILLAR 3 DISCLOSURES			Disclosure Provided				Frequency				Location of Disclosure**
			Yes	No	N/A	If No or N/A reason disclosure not provided	Annual	Qrtly	Semi A	If other provide details	
		changes in these practices.									
Quantitative disclosures*	(b)	Value disclosed in the balance sheet of investments, as well as the fair value of those investments; for quoted securities, a comparison to publicly quoted share values where the share price is materially different from fair value.									
	(c)	The types and nature of investments, including the amount that can be classified as:									
		• Publicly traded; and									
		• Privately held.									
	(d)	The cumulative realised gains (losses) arising from sales and liquidations in the reporting period.									
	(e)	• Total unrealised gains (losses)[28]									
		• Total latent revaluation gains (losses)[29]									
		• any amounts of the above included in Tier 1 and/or Tier 2 capital.									
	(f)	Capital requirements broken down by appropriate equity groupings, consistent with the bank's methodology, as well as the aggregate amounts and the type of equity investments subject to any supervisory transition or grandfathering provisions regarding regulatory capital requirements.									
Table 12 - Interest rate risk in the banking book (IRRBB)											
Qualitative disclosures	(a)	The general qualitative disclosure requirement (paragraph 824), including the nature of IRRBB and key assumptions, including assumptions regarding loan prepayments and behaviour of non-maturity deposits, and frequency of IRRBB measurement.									

[28] Unrealised gains (losses) recognised in the balance sheet but not through the profit and loss account.
[29] Unrealised gains (losses) not recognised either in the balance sheet or through the profit and loss account.

Annex 1.1

Application of the 15% Tier 1 limit on Innovative Instruments

1. Innovative instruments are limited to a maximum of 15% of Tier 1 capital, net of goodwill. To determine the allowable amount of innovative instruments, the amount of non-innovative Tier 1 should be multiplied by 17.65% (i.e. 15% of 85%).

2. Thus, for example, where a bank has $75 million of common equity, $15mn of non-cumulative preferred stock, $5mn of minority interest in the common equity of a consolidated subsidiary, and$10mn of goodwill, the net amount of non-innovative tier 1 capital is $85mn (75+15+5-10). Accordingly, the allowable amount of innovative instruments for inclusion in tier 1 capital in this case is $85mn x17.65% = $15mn. If the bank issues innovative instruments up to its limit, total tier 1 capital would amount to $85mn + $15mn = $100mn.

Annex 2.1
MARKET RISK

Trading Book: Definitions and Key Requirements

1. An institution's trading book consists of positions in financial instruments and commodities held either with the intention of trading (see paragraph 3 below) or in order to hedge other elements of the trading book. Positions not assigned to the trading book fall into the banking book. To be eligible for trading book capital treatment, financial instruments (as defined under paragraph 2 below) must either be free of any restrictive covenants affecting their tradability or else able to be hedged completely[1]. In addition, trading book positions must be subject to frequent and accurate re-valuation, and the portfolio must be actively managed. An institution must have clearly defined policies and procedures for determining which exposures to include in, and which to exclude from, the trading book for purposes of calculating its regulatory capital. It must also take into account its particular risk management capabilities and practices, while ensuring that they comply at all times with the criteria for the trading book, set out in paragraphs 4 and 5 below. Compliance with relevant policies and procedures must be fully documented and subject to periodic internal audit review. Moreover, the institution must agree with the Authority a trading book policy statement, approved by its Board of Directors, setting out its general approach to the management of market risks (see paragraph 10 below).

2. A financial instrument is any contract that gives rise to both a financial asset in one entity and a financial liability or equity instrument in another entity. Financial instruments include both primary financial instruments (or cash instruments) and derivative financial instruments. Typical examples include transferable securities, money market instruments (e.g. treasury bills, CDs and commercial paper), financial futures contracts, forward rate agreements, interest-rate, currency and equity swaps, as well as options to acquire or dispose of any of the above. A financial asset is any asset that is cash, the right to receive cash or another financial asset; or the contractual right to exchange financial assets on potentially favorable terms, or an equity instrument. A financial liability is the contractual obligation to deliver cash or another financial asset or to exchange financial liabilities under conditions that are potentially unfavourable.

3. Positions held with the intention of trading[2] are those held expressly for short-term resale and/or with the intention of benefiting from actual or expected short-term price movements, or to lock in arbitrage profits, and may include proprietary positions,

[1] A hedge is a position that materially or entirely offsets the component risk elements of another trading book position or portfolio. Trading book exposures may be hedged with positions which in their own right would not normally qualify for inclusion in the trading book. Such positions must be marked to market daily, and will attract both counterparty risk and general position risk capital requirements. The effectiveness of a hedge should be defined within the accounting framework adopted by the institution for financial reporting.

[2] Cash held in money market funds should be excluded from the trading book.

positions arising from client servicing (e.g. matched principal broking) and market making.

4. Policies and procedures with regard to the trading book must, at a minimum, address the general considerations listed below. These are not intended to be specific tests governing eligibility, but rather a minimum set of key points that should be addressed by the policies and procedures for overall management of the institution's trading book:

a) details of the activities considered to be trading and constituting part of the trading book for regulatory capital purposes;

b) the extent to which exposures can be marked to market daily by reference to an active, liquid, two-way market;

c) for exposures that are marked-to-model, the extent to which the institution can;
(i) identify the material risks of the exposure;
(ii) hedge the material risks of the exposure and the extent to which hedging instruments would have an active, liquid, two-way market;
(iii) derive reliable estimates for the key assumptions and parameters used in the model.

d) the extent to which the institution can and is required to generate valuations for the exposure that can be validated externally in a consistent manner;

e) the extent to which legal restrictions or other operational requirements would impede the institution's ability to effect an immediate liquidation of the exposure;

f) the extent to which the institution is required to, and can, actively risk manage the exposure within its trading operations; and

g) the extent to which the institution may transfer risk or exposures between the banking and trading books, and the criteria for such transfers.

5 The basic requirements for positions eligible to receive trading book capital treatment are as follows:

a) Institutions must have a clearly documented trading strategy, approved by senior management, covering the relevant positions, instruments and portfolios, and including details of expected holding horizons;

b) Clearly defined policies and procedures must be in place for the active management of the positions, including:

- positions to be managed on a trading desk
- position limits to be in place and regularly monitored for appropriateness

- dealers must have autonomy to enter into/manage the position within agreed limits and in accordance with agreed strategy
- positions must be marked to market on at least a daily basis and, when marking to model, the parameters must be assessed on a daily basis
- positions must be reported to senior management as an integral part of the institution's risk management process
- positions must be actively monitored with reference to market information sources, and assessment made of market liquidity or the ability to hedge positions or the portfolio risk profiles. This includes assessing the quality and availability of market inputs to the valuation process, level of market turnover, sizes of positions traded in the market, etc.

c) Clearly defined policy and procedures must be in place relating to the monitoring of positions against trading book strategy, including the monitoring of turnover and stale positions in the institution's trading book.

6. When a banking book credit risk exposure is hedged using a credit derivative booked in the trading book (i.e. using an internal hedge), the banking book exposure is not deemed to be protected for capital purposes unless a credit derivative which meets the conditions set out in paragraph 2 of Annex 2.10 is purchased from an eligible third party protection provider. Where such third party protection is purchased and is recognized as a hedge of a banking book exposure for regulatory capital purposes, neither the internal nor external credit derivative hedge is included in the trading book for regulatory capital purposes.

7. Positions in an institution's own eligible regulatory capital instruments must always be deducted from capital. The same applies with regard to positions in eligible regulatory capital instruments issued by other banks, securities firms and other financial entities, in accordance with paragraph 12 of Part 1 of this paper. Exceptionally, where an institution can demonstrate that it is an active market-maker, the Authority will be prepared to approve a dealer exception, provided it is satisfied as to the systems and controls surrounding the trading of the paper in question.

8 Term trading-related repo-style transactions that are accounted for within the banking book may be included in the trading book for regulatory capital purposes provided all such transactions are so included. For this purpose, trading-related repo-style transactions are defined only as those that meet the requirements of paragraphs 1, 3, 4 and 5 of this Annex, where both legs are in the form either of cash or securities eligible for inclusion within the trading book. Regardless of whether transactions are booked in the banking book or the trading book, all repo-style transactions are subject to a banking book counterparty credit risk charge.

De Minimis Threshold

9. In assessing the proportion of an institution's trading book business relative to its total business, the following formula is used:

$$\frac{\text{total trading book open position}}{(\text{total trading book open position}) + (\text{on and off-balance assets not part of the trading book})}$$

For the purpose of calculating the total open position in the trading book, long and short positions are summed, regardless of whether they are positive or negative. Debt instruments are valued at their market prices or principal values, and equities and commodities at their market prices. Where a derivative is based on an underlying security, it is valued according to the market value of that security or commodity. Otherwise the notional principal amount underlying the derivative should be used. Underwriting positions (which always belong in the trading book) are valued according to the full market value of the underlying securities. Forward foreign exchange contracts are (for this purpose only) treated as banking book business; however, FX futures and options (since they are financial instruments) are, unless hedging the banking book, treated as trading book items.

Trading Book Policy Statement

10. Each licensed institution must agree a trading book policy statement with the Authority. This includes the case of institutions seeking exemption from the detailed market risk calculations since exemption is dependent on receipt by the Authority of such a statement. Statements should be approved by an institution's Board, and should be reviewed at least annually and updated as necessary. Where statements are prepared on a consolidated basis for a banking group, they need to make clear the application to each deposit-taking or licensed investment business subsidiary within the group. The policy statement should be in two parts. The first part should:

a) List the activities the institution normally considers as trading and constituting part of the trading book, together with a list of excluded activities and the rationale for the classification;
b) Identify the process used in valuing positions, including in particular those for which market prices are not readily available;
c) Specify the procedures used for the transfer of risk or instruments between the banking and trading books;
d) Comment on the treatment of deposit-taking subsidiaries to be excluded from the market risk calculation; and
e) Explain the procedures in place to monitor adherence to the threshold limits for exempted entities within the group.

11. The second part of the statement should identify the methodology which the

institution intends to adopt for calculating capital requirements for its trading book risk. Institutions have certain choices as to methods for calculating various of the position risk capital requirements (e.g. for interest-rate risk they may choose between simplified methods, standard methods or the use of models).

12. Where institutions intend to seek exemption under the de minimis threshold and continue to calculate their capital adequacy on the basis of banking book risk-weighted assets, their trading book policy statement need only include the details listed under 10 a) and 10 e) above.

13. A number of matters require specific Authority approval before institutions may proceed to make use of them within their trading books:

a) collateralization policies in respect of repurchase/reverse repurchase/stock lending/stock borrowing transactions
b) approval of alternative valuation methods
c) approval of underwriting
d) permission for the use of models

14. Institutions making use of the market risk calculation methodology should discuss with their external auditors to ensure that:

a) The criteria used for the allocation of positions are reasonable and in accordance with their accounting policies; and

b) Their policy for the valuation of positions is acceptable and in accordance with best accounting practice.

15. Institutions' trading book policy statements must be reviewed frequently (at least annually), and, where necessary, updated subject to agreement with the Authority. Updated statements need to be reviewed and approved by the institution's Board of Directors.

Prudent Valuation of Trading Book Positions

16. The following paragraphs provide guidance with regard to prudent valuation of positions in the trading book. The guidance is particularly important for less liquid positions which, although they will not be excluded from the trading book solely on grounds of diminished liquidity, raise supervisory concerns about prudent valuation.

17. A framework for prudent valuation practices should at a minimum include the following:

a) Systems and Controls

Institutions must establish and maintain adequate systems and controls sufficient to give management and supervisors confidence that their valuation estimates are prudent and reliable. These systems must be integrated with other risk management systems within the institution (e.g. for credit analysis). Such systems must include:

(i) documented policies and procedures for the process of valuation. This includes clearly defined responsibilities of the various areas involved in the determination of the valuation, sources of market information and review of their appropriateness, frequency of independent valuation, timing of closing prices, procedures for adjusting valuations, end of the month and ad hoc verification procedures; and

(ii) clear and independent (i.e. independent of the front office) reporting lines for the department accountable for the valuation process. The reporting line should ultimately be to a main board executive director.

b) Valuation Methodologies

Marking to Market involves the at least daily valuation of positions at readily available close-out prices that are sourced independently. Examples of readily available close-out prices include exchange rates, screen prices, or quote from several independent reputable brokers. Institutions must mark to market as much as possible. The more prudent side of bid/offer must be used unless the institution is a significant market maker in a particular position type and it can close out at mid-market.

Marking to Model may be used where marking to market is not possible and marking to model can be demonstrated to be prudent. Marking to Model is defined as any valuation which has to be benchmarked, extrapolated or otherwise calculated from a market input. When marking to model, an extra degree of conservatism is appropriate. In assessing whether a mark to model valuation is prudent, the Authority reviews the following aspects:

- senior management should be aware of the elements of the trading book which are subject to mark to model and should understand the materiality of the resulting uncertainty in the reporting of the risk/performance of the business;
- market inputs should be sourced, to the extent possible, in line with market prices (see above). The appropriateness of the market inputs for the particular position being valued should be reviewed regularly;
- where available, generally accepted valuation methodologies for particular products should be used as far as possible;
- where the model is developed by the institution itself, it should be based on appropriate assumptions, which have been assessed and subjected to challenge

by suitably qualified parties independent of the development process. The model should be developed or approved independently of the front office. It should be independently tested. This includes validating the mathematics, the assumptions and the software implementation;

- there should be formal change control procedures in place and a secure copy of the model should be held and periodically used to check valuations;
- Risk Management should be aware of the weaknesses of the models used and how best to reflect these in the valuation output;
- the model should be subject to periodic review to determine the accuracy of its performance (e.g. assessing continued appropriateness of the assumptions, analysis of P&L versus risk factors, comparison of actual close-out values to model outputs);
- valuation adjustments should be made as appropriate, for example, to cover the uncertainty of the model valuation (see also comments on valuation adjustments in (c) below).

Independent Price Verification

Independent price verification is distinct from daily mark to market. It is the process by which market prices or model inputs are regularly verified for accuracy. While daily marking to market may be performed by dealers, verification of market prices or model inputs should be performed by a unit independent of the dealing room, at least monthly (or, depending on the nature of the market/trading activity, more frequently). It need not be performed as frequently as daily marking to market, since the objective, i.e. independent marking of positions, should reveal any error or bias in pricing, thereby resulting in the elimination of inaccurate daily marks. Independent price verification entails a higher standard of accuracy in that the market prices or model inputs are used to determine profit and loss figures, whereas daily marks are used primarily for management reporting in between reporting dates. For independent price verification, whereas pricing sources are more subjective e.g. only one available broker quote, prudent measures such as valuation adjustments may be appropriate.

(c) Valuation adjustments or reserves

Institutions must establish and maintain procedures for considering the need for valuation adjustments/reserves. This applies both where third party valuations are used and where positions are marked to model. The Authority expects at a minimum the possible need for the following valuation adjustments/reserves to be formally considered: unearned credit spreads; close-out costs; operational risks; early termination; investing and funding costs; future administrative costs; and, where appropriate, model risk.

Bearing in mind that the 10-day assumption included in the quantitative standards under the internal model approach may be inconsistent with an institution's ability to sell or hedge out positions under normal market conditions, institutions must make downward valuation adjustments/reserves for these less liquid positions, and must review their continued appropriateness on an ongoing basis. Reduced liquidity may arise from market

events. Additionally, close-out prices for concentrated positions and/or stale positions should be considered in establishing those valuation adjustments/reserves. Institutions must consider all relevant factors when determining the appropriateness of valuation adjustments/reserves for less liquid positions. These factors may include, but are not limited to, the amount of time it would take to hedge out the position/risks within the position, the average volatility of bid/offer spreads, the availability of independent market quotes (number and identity of market makers), the average and volatility of trading volumes, market concentrations, the aging of positions, the extent to which valuation relies on marking to model, and the impact of other model risks. Resulting valuation adjustments/reserves must impact Tier 1 regulatory capital, and may exceed those made pursuant to financial accounting standards.

Annex 2.2

Definition of Capital included in the Capital Base

A Capital Elements

Tier 1

(a) Paid up share capital/common stock

(b) Disclosed reserves

Tier 2

(a) Undisclosed reserves

(b) Asset revaluation reserves

(c) General provisions/ general loan-loss reserves [subject to a limit of 1.25% of risk-weighted assets (standardized approach) or 0.6% of credit risk-weighted assets where an IRB approach is used for credit risk]

(d) Hybrid (debt/equity) capital instruments

(e) Subordinated debt

Tier 3: Short term subordinated debt meeting the conditions set out in paragraph 41 of the paper may be used for the purpose and subject to the limits set out in paragraph 40 of the paper.

The sum of Tier 1, tier 2 and Tier 3 elements is eligible for inclusion in the capital base, subject to the limits set out below.

B Limits and Restrictions

(i) The total of Tier 2 (supplementary) elements is limited to a maximum of 100% of the total of the Tier 1 elements;

(ii) Subordinated term debt is limited to a maximum of 50% of Tier 1 elements;

(iii) Tier 3 capital is limited to 250% of the amount of Tier 1 capital required to support market risks;

(iv) Where general provisions/general loan-loss reserves include amounts reflecting lower valuations of asset or latent but unidentified losses present in the balance sheet, the amount of such provisions or reserves is limited to a maximum of 1.25% of risk-weighted assets;

(v) Asset revaluation reserves which take the form of latent gains on unrealized securities (see below) are subject to a discount of 55%.

C Deductions from the Capital Base

From Tier 1:

Goodwill and increase in equity capital resulting from a 'gain on sale' pursuant to the securitization rules in paragraph 117 of section B of Part 2 of the paper.

From the aggregate of Tier 1 and Tier 2 capital:

(i) Investments in unconsolidated banking and financial company subsidiaries;

(ii) Investments in the capital of other banks and financial institutions;

(iii) Significant minority investments in other financial entities;

(iv) Significant investments in other commercial entitles which exceed the materiality thresholds.

D Definition of Capital Elements

(i) Tier 1: includes only **permanent shareholders' equity** (issued and fully paid ordinary shares/common stock and perpetual non-cumulative preference shares) and **disclosed reserves** (created or increased by appropriations of retained earnings or other surplus e.g., share premiums, retained profit, general reserves and legal reserves). Disclosed reserves also include general funds of the same quality that meet the following criteria:

- allocations to the funds are made out of post-tax retained earnings or out of pre-tax earnings adjusted for all potential tax liabilities;
- the funds and movements into or out of them must be disclosed separately in the published financial statements;
- the funds must be available to a bank to meet losses for unrestricted and immediate use as soon as they occur;
- losses cannot be charged directly to the funds but must be taken through the profit and loss account.

In the case of consolidated statements, this also includes minority interests in the equity of subsidiaries which are less than wholly owned. This basic definition of capital excludes revaluation reserves and cumulative preference shares.

(ii) Tier 2

(a) Undisclosed reserves are eligible for inclusion within supplementary elements where these reserves are accepted by the relevant supervisor. Such reserves consist of that part of the accumulated after-tax surplus of retained profits which banks in some

countries may be permitted to maintain as an undisclosed reserve. Apart from the fact that the reserve is not identified in the published balance sheet, it should have the same high quality and character as a disclosed reserve; as such, it should not be encumbered by any provision or other known liability but should be freely and immediately available to meet unforeseen future losses. This definition of undisclosed reserves excludes hidden values arising from holdings of securities in the balance sheet at below current market prices (see below).

(b) Revaluation reserves arise in two ways. First, banks (and other companies) may be permitted to revalue fixed assets, normally their own premises, from time to time to reflect changes in market values. In some cases, the amount of the revaluation is determined by law. Such revaluations are reflected on the face of the balance sheet as a revaluation reserve.

Secondly, hidden values of 'latent' revaluation reserves may be present as a result of long-term holdings of equity securities valued in the balance sheet at the historic cost of acquisition.

Both types of revaluation reserve may be included in tier 2 capital provided that the assets are prudently valued, fully reflecting the possibility of price fluctuation and forced sale. In the case of 'latent' revaluation reserves a discount of 55% is applied to the difference between historic book cost and market value to reflect the potential volatility of this form of unrealized capital and the notional tax change on it.

(c) General provisions/general loan-loss reserves (for banks using the Standardized approach for Credit risk): provisions or loan-loss reserves held against future, presently unidentified losses are freely available to meet losses which subsequently materialize, and therefore qualify for inclusion within supplementary elements. Provisions ascribed to identified deterioration of particular assets or known liabilities, whether individual or grouped, must be excluded. Furthermore, general provisions/ loan-loss reserves eligible for inclusion within Tier 2 are limited to a maximum of 1.25% of weighted risk assets.

(d) Hybrid (debt/equity) capital instruments: includes a range of instruments which combine characteristics of equity capital and debt. Their precise specifications may differ, but they must meet the following requirements:

- they are unsecured, subordinated and fully paid-up;
- they are not redeemable at the initiative of the holder or without the prior consent of the supervisory authority;
- they are available to participate in losses without the bank being obliged to cease trading (unlike conventional subordinated debt);

- although the capital instrument may carry an obligation to pay interest that cannot permanently be reduced or waived (unlike dividends on ordinary shareholders' equity), it should allow service obligations to be deferred (as with cumulative preference shares) where the profitability of the bank does not support payment.

Cumulative preference shares, having these characteristics, are also eligible for inclusion in this category. In addition, the following are examples of instruments that may be eligible for inclusion: long term preferred shares in Canada; titres participatifs and titres subordonnes a duree indeterminee in France; Genusscheine in Germany; perpetual subordinated debt and preference shares in the UK, and mandatory convertible debt instruments in the US. Debt capital instruments which do not meet these criteria may be eligible for inclusion in item (e).

(e) Subordinated term debt: includes conventional unsecured subordinated debt capital instruments with a minimum original fixed term to maturity of over 5 years, and limited life redeemable preference shares. During the last 5 years to maturity, a cumulative discount (or amortization) factor of 20% per year is applied to reflect the diminishing value of the instruments as a continuing source of strength. Unlike instruments included in item (d) above, these instruments are not normally available to participate in the losses of a bank which continues trading. For this reason, such instruments are limited to a maximum of 50% of Tier 1 capital.

Annex 2.3

Treatment of Counterparty Credit Risk and Cross-Product Netting

1. These provisions identify permissible methods for estimating the Exposure at Default (EAD) or the exposure amount for instruments with counterparty credit risk (CCR).[3] Institutions may seek supervisory approval to make use of an internal modeling method meeting the requirements and specifications identified here. As alternatives they may also use the standardized method or the current exposure method.

I. Definitions and general terminology

2. This section defines terms used throughout.

A. General terms

- **Counterparty Credit Risk (CCR)** is the risk that the counterparty to a transaction could default before the final settlement of the transaction's cash flows. An economic loss would occur if the transactions or portfolio of transactions with the counterparty has a positive economic value at the time of default. Unlike a firm's exposure to credit risk through a loan, where the exposure to credit risk is unilateral and only the lending bank faces the risk of loss, CCR creates a bilateral risk of loss: the market value of the transaction can be positive or negative to either counterparty to the transaction. The market value is uncertain and can vary over time with the movement of underlying market factors.

B. Transaction types

- **Long Settlement Transactions** are transactions where a counterparty undertakes to deliver a security, a commodity, or a foreign exchange amount against cash, other financial instruments, or commodities, or vice versa, at a settlement or delivery date that is contractually specified as more than the lower of the market standard for this particular instrument and five business days after the date on which the bank enters into the transaction.

- **Securities Financing Transactions (SFTs)** are transactions such as repurchase agreements, reverse repurchase agreements, security lending and borrowing, and margin lending transactions, where the value of the transactions depends on market valuations and the transactions are often subject to margin agreements.

- **Margin Lending Transactions** are transactions in which an institution extends

[3] In the present document, the terms "exposure at default" and "exposure amount" are used together in order to identify measures of exposure under both an IRB and a standardized approach for credit risk.

credit in connection with the purchase, sale, carrying or trading of securities. Margin lending transactions do not include other loans that happen to be secured by securities collateral. Generally, in margin lending transactions, the loan amount is collateralized by securities whose value is greater than the amount of the loan.

C. Netting sets, hedging sets, and related terms

- **Netting Set** is a group of transactions with a single counterparty that are subject to a legally enforceable bilateral netting arrangement and for which netting is recognised for regulatory capital purposes under the provisions of paragraphs 97 to 101 of this Annex, the Authority's rules on credit risk mitigation techniques, or the Cross-Product Netting Rules set out below. Each transaction that is not subject to a legally enforceable bilateral netting arrangement that is recognised for regulatory capital purposes should be interpreted as its own netting set for the purpose of these rules.

- **Risk Position** is a risk number that is assigned to a transaction under the CCR standardized method (set out in this Annex) using a regulatory algorithm.

- **Hedging Set** is a group of risk positions from the transactions within a single netting set for which only their balance is relevant for determining the exposure amount or EAD under the CCR standardized method.

- **Margin Agreement** is a contractual agreement or provisions to an agreement under which one counter party must supply collateral to a second counterparty when an exposure of that second counterparty to the first counterparty exceeds a specified level.

- **Margin Threshold** is the largest amount of an exposure that remains outstanding until one party has the right to call for collateral.

- **Margin Period of Risk** is the time period from the last exchange of collateral covering a netting set of transactions with a defaulting counterpart until that counterpart is closed out and the resulting market risk is re-hedged.

- **Effective Maturity under the Internal Model Method** for a netting set with maturity greater than one year is the ratio of the sum of expected exposure over the life of the transactions in a netting set discounted at the risk-free rate of return divided by the sum of expected exposure over one year in a netting set discounted at the risk-free rate. This effective maturity may be adjusted to reflect rollover risk by replacing expected exposure with effective expected exposure for forecasting horizons under one year. The formula is given in paragraph 38, below.

- **Cross-Product Netting** refers to the inclusion of transactions of different product categories within the same netting set pursuant to the Cross-Product Netting Rules

set out in this Annex.

- **Current Market Value (CMV)** refers to the net market value of the portfolio of transactions within the netting set with the counterparty. Both positive and negative market values are used in computing CMV.

D. Distributions

- **Distribution of Market Values** is the forecast of the probability distribution of net market values of transactions within a netting set for some future date (the forecasting horizon) given the realized market value of those transactions up to the present time.

- **Distribution of Exposures** is the forecast of the probability distribution of market values that is generated by setting forecast instances of negative net market values equal to zero (this takes account of the fact that, when the institution owes the counterparty money, it does not have an exposure to the counterparty).

- **Risk-Neutral Distribution** is a distribution of market values or exposures at a future time period where the distribution is calculated using market implied values such as implied volatilities.

- **Actual Distribution** is a distribution of market values or exposures at a future time period where the distribution is calculated using historic or realised values such as volatilities calculated using past price or rate changes.

E. Exposure measures and adjustments

- **Current Exposure** is the larger of zero, or the market value of a transaction or portfolio of transactions within a netting set with a counterparty that would be lost upon the default of the counterparty, assuming no recovery on the value of those transactions in bankruptcy. Current exposure is often also called Replacement Cost.

- **Peak Exposure** is a high percentile (typically 95% or 99%) of the distribution of exposures at any particular future date before the maturity date of the longest transaction in the netting set. A peak exposure value is typically generated for many future dates up until the longest maturity date of transactions in the netting set.

- **Expected Exposure** is the mean (average) of the distribution of exposures at any particular future date before the longest-maturity transaction in the netting set matures. An expected exposure value is typically generated for many future dates up until the longest maturity date of transactions in the netting set.

- **Effective Expected Exposure** at a specific date is the maximum expected exposure that occurs at that date or any prior date. Alternatively, it may be defined

for a specific date as the greater of the expected exposure at that date, or the effective exposure at the previous date. In effect, the Effective Expected Exposure is the Expected Exposure that is constrained to be non-decreasing over time.

- **Expected Positive Exposure (EPE)** is the weighted average over time of expected exposures where the weights are the proportion that an individual expected exposure represents of the entire time interval. When calculating the minimum capital requirement, the average is taken over the first year or, if all the contracts in the netting set mature before one year, over the time period of the longest-maturity contract in the netting set.

- **Effective Expected Positive Exposure (Effective EPE)** is the weighted average over time of effective expected exposure over the first year, or, if all the contracts in the netting set mature before one year, over the time period of the longest-maturity contract in the netting set where the weights are the proportion that an individual expected exposure represents of the entire time interval.

- **Credit Valuation Adjustment** is an adjustment to the mid-market valuation of the portfolio of trades with a counter party. This adjustment reflects the market value of the credit risk due to any failure to perform on contractual agreements with a counter party. This adjustment may reflect the market value of the credit risk of the counterparty or the market value of the credit risk of both the bank and the counterparty.

- **One-Sided Credit Valuation Adjustment** is a credit valuation adjustment that reflects the market value of the credit risk of the counterparty to the firm, but does not reflect the market value of the credit risk of the bank to the counterparty.

F. CCR-related risks

- **Rollover Risk** is the amount by which expected positive exposure is understated when future transactions with a counterpart are expected to be conducted on an ongoing basis, but the additional exposure generated by those future transactions is not included in calculation of expected positive exposure.

- **General Wrong-Way Risk** arises when the probability of default of counterparties is positively correlated with general market risk factors.

- **Specific Wrong-Way Risk** arises when the exposure to a particular counterpart is positively correlated with the probability of default of the counterparty due to the nature of the transactions with the counterparty.

II. Scope of application

3. The methods for computing the exposure amount under the standardized approach for credit risk or EAD under the internal ratings-based (IRB) approach to credit risk

described in this Annex are applicable to SFTs and OTC derivatives.

4. Such instruments generally exhibit the following abstract characteristics:

- The transactions generate a current exposure or market value.
- The transactions have an associated random future market value based on market variables.
- The transactions generate an exchange of payments or an exchange of a financial instrument (including commodities) against payment.
- The transactions are undertaken with an identified counterparty against which a unique probability of default can be determined[4].

5. Other common characteristics of the transactions to be covered may include the following:

- Collateral may be used to mitigate risk exposure and is inherent in the nature of some transactions.
- Short-term financing may be a primary objective in that the transactions mostly consist of an exchange of one asset for another (cash or securities) for a relatively short period of time, usually for the business purpose of financing. The two sides of the transactions are not the result of separate decisions but form an indivisible whole to accomplish a defined objective.
- Netting may be used to mitigate the risk. Positions are frequently valued (most commonly on a daily basis), according to market variables.
- Re-margining may be employed.

6. An exposure value of zero for counterparty credit risk can be attributed to derivative contracts or SFTs that are outstanding with a central counterparty (e.g. a clearing house). This does not apply to counter party credit risk exposures from derivative transactions and SFTs that have been rejected by the central counterparty. Furthermore, an exposure value of zero can be attributed to banks' credit risk exposures to central counterparties that result from the derivative transactions. SFTs or spot transactions that the bank has outstanding with the central counterparty. This exemption extends in particular to credit exposures from clearing deposits and from collateral posted with the central counterparty. A central counterparty is an entity that interposes itself between counterparties to contracts traded within one or more financial markets, becoming the legal counterparty such that it is the buyer to every seller and the seller to every buyer. In order to qualify for the above exemptions, the central counterparty CCR exposures with all participants in its arrangements must be fully collateralized on a daily basis, thereby providing protection for the central counterparty's CCR exposures. Assets held by a central counterparty as a custodian on the bank's behalf would not be subject to a capital requirement for counterparty credit risk exposure.

7. Under all of the three methods identified in this Annex, when an institution

[4] Transactions for which the probability of default is defined on a pooled basis are not included in this treatment of CCR.

purchases credit derivative protection against a banking book exposure, or against a counterparty credit risk exposure, it will determine its capital requirement for the hedged exposure subject to the criteria and general rules for the recognition of credit derivatives, i.e. substitution or double default rules as appropriate. Where these rules apply, the exposure amount or EAD for counterparty credit risk from such instruments is zero.

8. The exposure amount or EAD for counterparty credit risk is zero for sold credit default swaps in the banking book where they are treated in the framework as a guarantee provided by the bank and subject to a credit risk charge for the full notional amount.

9. Under all three methods identified in this Annex, the exposure amount or EAD for a given counterparty is equal to the sum of the exposure amounts or EADs calculated for each netting set with that counterparty.

III. Cross-product netting rules[5]

10. Institutions that receive approval to estimate their exposures to CCR using the internal model method may include within a netting set SFTs, or both SFTs and OTC derivatives subject to a legally valid form of bilateral netting that satisfies the following legal and operational criteria for a Cross-Product Netting Arrangement (as defined below). The institution must also have satisfied any prior approval or other procedural requirements that its national supervisor determines to implement for purposes of recognizing a Cross-Product Netting Arrangement.

Legal Criteria

11. The institution must have executed a written, bilateral netting agreement with the counterparty that creates a single legal obligation, covering all included bilateral master agreements and transactions ("Cross-Product Netting Arrangement"), such that it would have either a claim to receive or obligation to pay only the net sum of the positive and negative (i) closeout values of any included individual master agreements and (ii) mark-to-market values of any included individual transactions (the "Cross-Product Net Amount"), in the event a counterparty fails to perform due to any of the following: default, bankruptcy, liquidation or similar circumstances.

12. The institution has written and reasoned legal opinions that conclude with a high degree of certainty that, in the event of a legal challenge, relevant courts or administrative authorities would find the firm's exposure under the Cross-Product Netting Arrangement to be the Cross-Product Net Amount under the laws of all relevant jurisdictions. In reaching this conclusion, legal opinions must address the validity and enforceability

[5] These Cross-Product Netting Rules apply specifically to netting across SFTs, or to netting across both SFTs and OTC derivatives, for purposes of regulatory capital computation under the Internal Models Method (IMM). They do not revise or replace the rules that apply to recognition of netting within the OTC derivatives, repo-style transaction, and margin lending transaction product categories. The rules in the 1988 Accord and this Framework continue to apply for purposes of regulatory capital recognition of netting within product categories under IMM or other relevant methodology.

of the entire Cross-Product Netting Arrangement under its terms and the impact of the Cross-Product Netting Arrangement on the material provisions of any included bilateral master agreement.

- The laws of "all relevant jurisdictions" are: (i) the law of the jurisdiction in which the counterparty is chartered and, if the foreign branch of a counterparty is involved, then also under the law of the jurisdiction in which the branch is located, (ii) the law that governs the individual transactions, and (iii) the law that governs any contract or agreement necessary to effect the netting.

- A legal opinion must be generally recognized as such by the legal community in the firm's home country or a memorandum of law that addresses all relevant issues in a reasoned manner.

13. The institution has internal procedures to verify that, prior to including a transaction in a netting set, the transaction is covered by legal opinions that meet the above criteria.

14. The institution undertakes to update legal opinions as necessary to ensure continuing enforceability of the Cross-Product Netting Arrangement in light of possible changes in relevant law.

15. The Cross-Product Netting Arrangement does not include a walk away clause. A walk away clause is a provision which permits a non-defaulting counterparty to make only limited payments, or no payment at all, to the estate of the defaulter, even if the defaulter is a net creditor.

16. Each included bilateral master agreement and transaction included in the Cross-Product Netting Arrangement satisfies applicable legal requirements for recognition of (i) bilateral netting of derivatives contracts in paragraphs 97 to 100 of this Annex, or (ii) credit risk mitigation techniques in Part 2, Section B iii) of this paper.

17. The institution maintains all required documentation in its files.

Operational Criteria

18. The Authority must be satisfied that the effects of a Cross-Product Netting Arrangement are factored into the firm's measurement of a counter party's aggregate credit risk exposure and that the institution manages its counterparty credit risk on such basis.

19. Credit risk to each counter party is aggregated to arrive at a single legal exposure across products covered by the Cross-Product Netting Arrangement. This aggregation must be factored into credit limit and economic capital processes.

IV. Approval to adopt an internal modeling method to estimate EAD

20. Institutions wishing to adopt an internal modeling method to measure exposure or EAD for regulatory capital purposes must seek approval from the Authority. The internal modeling method is available both for institutions that adopt the internal ratings-based approach to credit risk and for banks for which the standardized approach to credit risk applies to all of their credit risk exposures. Institutions must meet all of the requirements given in Section V of this Annex and must apply the method to all of their exposures that are subject to counterparty credit risk, except for long settlement transactions.

21. An institution may also choose to adopt an internal modeling method to measure CCR for regulatory capital purposes for its exposures or EAD to only OTC derivatives, to only SFTs, or to both, subject to the appropriate recognition of netting specified above. It must apply the method to all relevant exposures within that category, except for those that are immaterial in size and risk. During the initial implementation of the internal models method, an institution may use the standardized method or the current exposure method for a portion of its business. It must submit plans to the Authority for bringing all material exposures for that category of transactions under the internal model method.

22. For all OTC derivative transactions and for all long settlement transactions for which an institution has not received approval from its supervisor to use the internal models method, it must use either the standardized method or the current exposure method. Combined use of the current exposure method and the standardized method is permitted on a permanent basis within a group. Combined use of the current exposure method and the standardized method within a legal entity is only permissible for the cases indicated in paragraph 90 of this Annex.

23. Exposures or EAD arising from long settlement transactions can be determined using any of the three methods identified in this document regardless of the methods chosen for treating OTC derivatives and SFTs. In computing capital requirements for long settlement transactions institutions that hold permission to use the internal ratings-based approach may opt to apply the risk weights under the standardized approach for credit risk on a permanent basis and irrespective to the materiality of such positions.

24. After adoption of the internal model method, the institution must comply with the above requirements on a permanent basis. Only under exceptional circumstances or for immaterial exposures can it revert to either the current exposure or standardized methods for all or part of its exposure. The institution must demonstrate that reversion to a less sophisticated method does not lead to an arbitrage of the regulatory capital rules.

V. Internal Model Method: measuring exposure and minimum requirements

A. Exposure amount or EAD under the internal model method

25. CCR exposure or EAD is measured at the level of the netting set as defined in Sections I and III of this Annex. A qualifying internal model for measuring counterparty credit exposure must specify the forecasting distribution for changes in the market value of the netting set attributable to changes in market variables, such as interest rates, foreign exchange rates, etc. The model then computes the firm's CCR exposure for the netting set at each future date given the changes in the market variables. For margined counterparties, the model may also capture future collateral movements. Institutions may include eligible financial collateral as defined in paragraph 2 of Annex 2.7 in their forecasting distributions for changes in the market value of the netting set, if the quantitative, qualitative and data requirements for internal model method are met for the collateral.

26. To the extent that an institution recognizes collateral in exposure amount or EAD via current exposure, it may not recognize the benefits in its estimates of LGD. As a result, it is required to use an LGD of an otherwise similar uncollateralized facility. In other words, it must use an LGD that does not include collateral that is already included in EAD.

27. Under the Internal Model Method, an institution need not employ a single model. Although the following text describes an internal model as a simulation model, no particular form of model is required. Analytical models are acceptable so long as they are subject to supervisory review, meet all of the requirements set out in this section and are applied to all material exposures subject to a CCR-related capital charge as noted above, with the exception of long settlement transactions, which are treated separately, and with the exception of those exposures that are immaterial in size and risk.

28. Expected exposure or peak exposure measures should be calculated based on a distribution of exposures that accounts for the possible non-normality of the distribution of exposures, including the existence of leptokurtosis ("fat tails"), where appropriate.

29. When using an internal model, exposure amount or EAD is calculated as the product of alpha times Effective EPE, as specified below:

$$\text{EAD} = \alpha \times \text{Effective EPE} \qquad (1)$$

30. Effective EPE ("Expected Positive Exposure") is computed by estimating expected exposure (EE_t) as the average exposure at future date t, where the average is taken across possible future values of relevant market risk factors, such as interest rates, foreign exchange rates, etc. The internal model estimates EE at a series of future dates t_l,

t_2, t_3 ...[6] Specifically, "Effective EE" is computed recursively as:

$$\text{Effective } EE_{tk} = \max(\text{Effective } EE_{tk-1i}\, EE_{tk}) \quad (2)$$

where the current date is denoted as t_0 and Effective EE_{to} equals current exposure.

31. In this regard, "Effective EPE" is the average Effective *EE* during the first year of future exposure. If all contracts in the netting set mature before one year, EPE is the average of expected exposure until all contracts in the netting set mature. Effective EPE is computed as a weighted average of Effective EE:

$$\textit{Effective EPE} = \sum_{k=1}^{\min(1\text{year},\text{maturity})} \textit{Effective } EE_{tk} \times \Delta t_k \quad (3)$$

where the weights $\Delta t_k = t_k - t_{k-i}$ allows for the case when future exposure is calculated at dates that are not equally spaced over time.

32. Alpha (α) is set equal to 1.4.

33. The Authority may require a higher alpha based on a firm's CCR exposures. Factors that may require a higher alpha include the low granularity of counterparties; particularly high exposures to general wrong-way risk; particularly high correlation of market values across counterparties; and other institution-specific characteristics of CCR exposures.

B. Own estimates for alpha

34. Institutions may seek approval from the Authority to compute internal estimates of alpha subject to a floor of 1.2, where alpha equals the ratio of economic capital from a full simulation of counterparty exposure across counterparties (numerator) and economic capital based on EPE (denominator), assuming they meet certain operating requirements. Eligible institutions must meet all the operating requirements for internal estimates of EPE and must demonstrate that their internal estimates of alpha capture in the numerator the material sources of stochastic dependency of distributions of market values of transactions or of portfolios of transactions across counterparties (e.g. the correlation of defaults across counterparties and between market risk and default).

35. In the denominator, EPE must be used as if it were a fixed outstanding loan amount.

[6] In theory, the expectations should be taken with respect to the actual probability distribution of future exposure and not the risk-neutral one. Supervisors recognize that practical considerations may make it more feasible to use the risk-neutral one. As a result, supervisors will not mandate which kind of forecasting distribution to employ.

36. To this end, institutions must ensure that the numerator and denominator of alpha are computed in a consistent fashion with respect to the modeling methodology, parameter specifications and portfolio composition. The approach used must be based on the firm's internal economic capital approach, be well-documented and be subject to independent validation. In addition, institutions must review their estimates on at least a quarterly basis, and more frequently when the composition of the portfolio varies over time. They must assess the model risk.

37. Where appropriate, volatilities and correlations of market risk factors used in the joint simulation of market and credit risk should be conditioned on the credit risk factor to reflect potential increases in volatility or correlation in an economic downturn. Internal estimates of alpha should take account of the granularity of exposures.

C. Maturity

38. If the original maturity of the longest-dated contract contained in the set is greater than one year, the formula for effective maturity (M) provided under the IRB rules is replaced with the following:

$$M = \frac{\sum_{k=1}^{t_k \le 1year} Effective\,EE_k \times \Delta t_k \times df_k + \sum_{t_k > 1year}^{maturity} EE_k \times \Delta t_k \times df_k}{\sum_{k=1}^{t_k \le 1year} Effective\,EE_k \times \Delta t_k \times df_k}$$

where df_k is the risk-free discount factor for future time period t_k and the remaining symbols are defined above. Similar to the treatment under corporate exposures, M has a cap of five years.[7]

39. For netting sets in which all contracts have an original maturity of less than one year, the formula for effective maturity (M) in the IRB rules is unchanged and a floor of one year applies, with the exception of defined short-term exposures.

D. Margin agreements

40. If the netting set is subject to a margin agreement and the internal model captures the effects of margining when estimating EE, the model's EE measure may be used directly in equation (2). Such models are noticeably more complicated than

[7] Conceptually, M equals the effective credit duration of the counterparty exposure. A bank that uses an internal model to calculate a one-sided credit valuation adjustment (CVA) can use the effective credit duration estimated by such a model in place of the above formula with prior approval of its supervisor.

models of EPE for un-margined counterparties. As such, they are subject to a higher degree of supervisory scrutiny before they are approved, as discussed below.

41. An institution that can model EPE without margin agreements but cannot achieve the higher level of modeling sophistication to model EPE with margin agreements can use the following method for margined counterparties. The method is a simple and conservative approximation to Effective EPE and sets Effective EPE for a margined counterparty equal to the lesser of:

- The threshold, if positive, under the margin agreement plus an add-on that reflects the potential increase in exposure over the margin period of risk. The add-on is computed as the expected increase in the netting set's exposure beginning from current exposure of zero over the margin period of risk.[8] A supervisory floor of five business days for netting sets consisting only of repo-style transactions subject to daily re-margining and daily mark-to-market, and 10 business days for all other netting sets is imposed on the margin period of risk used for this purpose;

- Effective EPE without a margin agreement.

E. Model validation

42. Because counterparty exposures are driven by movements in market variables, the validation of an EPE model is similar to the validation of a Value-at-Risk (VaR) model that is used to measure market risk. Therefore, in principle, the qualitative standards in Part 2 of this paper for the use of VaR models should be carried over to EPE models. However, an EPE model has additional elements that require validation:

- Interest rates, foreign exchange rates, equity prices, commodities, and other market risk factors must be forecast over long time horizons for measuring counterparty exposure. The performance of the forecasting model for market risk factors must be validated over a long time horizon. In contrast, VaR for market risk is measured over a short time horizon (typically, one to ten days).

- The pricing models used to calculate counterparty exposure for a given scenario of future shocks to market risk factors must be tested as part of the model validation process. These pricing models may be different from those used to calculate VaR over a short horizon. Pricing models for options must account for the nonlinearity of option value with respect to market risk factors.

- An EPE model must capture transaction-specific information in order to aggregate exposures at the level of the netting set. Institutions must verify that transactions are assigned to the appropriate netting set within the model.

[8] In other words, the add-on equals EE at the end of the margin period of risk assuming current exposure of zero. Since no roll-off of transactions would be occurring as part of this EE calculation, there would be no difference between EE and Effective EE.

- An EPE model must also include transaction-specific information in order to capture the effects of margining. It must take into account both the current amount of margin and margin that would be passed between counterparties in the future. Such a model must account for the nature of margin agreements (unilateral or bilateral), the frequency of margin calls, the margin period of risk, the threshold of un-margined exposure the bank is willing to accept, and the minimum transfer amount. Such a model must either model the mark-to-market change in the value of collateral posted or apply the rules for collateral set out in Part 2 of the paper.

43. Static, historical back-testing on representative counterparty portfolios must be part of the model validation process. At regular intervals as directed by its supervisor, an institution must conduct such back-testing on a number of representative counterparty portfolios (actual or hypothetical). These representative portfolios must be chosen based on their sensitivity to the material risk factors and correlations to which it is exposed.

44. Starting at a particular historical date, back-testing of an EPE model would use the internal model to forecast each portfolio's probability distribution of exposure at various time horizons. Using historical data on movements in market risk factors, back-testing then computes the actual exposures that would have occurred on each portfolio at each time horizon assuming no change in the portfolio's composition. These realized exposures would then be compared with the model's forecast distribution at various time horizons. The above must be repeated for several historical dates covering a wide range of market conditions (e.g. rising rates, falling rates, quiet markets, volatile markets). Significant differences between the realized exposures and the model's forecast distribution could indicate a problem with the model or the underlying data that the supervisor would require the institution to correct. Under such circumstances, the Authority may require additional capital. Unlike the back-testing requirement for VaR models prescribed in Part 2 of the paper and the corresponding requirements with regard to the backtesting of specific market risk, no particular statistical test is specified for back-testing of EPE models.

45. Under the internal model method, a measure that is more conservative than Effective EPE (e.g. a measure based on peak rather than average exposure) for every counterparty may be used in place of alpha times Effective EPE in equation (1) with the prior approval of the Authority. The degree of relative conservatism will be assessed upon initial supervisory approval and subject to periodic validation.

46. Institutions using an EPE model or a VaR model (as described in paragraphs 37-40 of Annex 2.8) must meet the above validation requirements.

F. Operational requirements for EPE models

47. In order to be eligible to adopt an internal model for estimating EPE arising from CCR for regulatory capital purposes, an institution must meet the following operational requirements. These include meeting the requirements related to the qualifying standards on CCR Management, a use test, stress testing, identification of wrong-way risk, and internal controls.

Qualifying standards on CCR Management

48. The institution must satisfy the Authority that, in addition to meeting the operational requirements identified in paragraphs 49 to 69 below, it adheres to sound practices for CCR management, including those specified in the market risk rules in Part 2, section D of this paper.

Use test

49. The distribution of exposures generated by the internal model used to calculate effective EPE must be closely integrated into the day-to-day CCR management process of the bank. For example, an institution could use the peak exposure from the distributions for counterparty credit limits or expected positive exposure for its internal allocation of capital. The internal model's output must accordingly play an essential role in the credit approval, counterparty credit risk management, internal capital allocations, and corporate governance of banks that seek approval to apply such models for capital adequacy purposes. Models and estimates designed and implemented exclusively to qualify for the internal models method are not acceptable.

50. An institution must have a credible track record in the use of internal models that generate a distribution of exposures to CCR. Thus, it must demonstrate that it has been using an internal model to calculate the distributions of exposures upon which the EPE calculation is based that meets broadly the minimum requirements for at least one year prior to supervisory approval.

51. Institutions employing the internal model method must have an independent control unit that is responsible for the design and implementation of the firm's CCR management system, including the initial and on-going validation of the internal model. This unit must control input data integrity and produce and analyze reports on the output of the firm's risk measurement model, including an evaluation of the relationship between measures of risk exposure and credit and trading limits. This unit must be independent from business credit and trading units; it must be adequately staffed; it must report directly to senior management of the firm. The work of this unit should be closely integrated into the day-to-day credit risk management process of the firm. Its output should accordingly be an integral part of the process of planning, monitoring and controlling the firm's credit and overall risk profile.

52. The internal model used to generate the distribution of exposures must be part of a counterparty risk management framework that includes the identification, measurement, management, approval and internal reporting of counterparty risk. This must include the measurement of usage of credit lines (aggregating counterparty exposures with other credit exposures) and economic capital allocation. In addition to EPE (a measure of future exposure), an institution must measure and manage current exposures. Where appropriate, it must measure current exposure gross and net of collateral held. The use test is satisfied if it uses other counterparty risk measures, such as peak exposure or potential future exposure (PFE), based on the distribution of exposures generated by the same model to compute EPE.

53. An institution is not required to estimate or report EE daily, but to meet the use test it must have the systems capability to estimate EE daily, if necessary, unless it demonstrates to the Authority that its exposures to CCR warrant some less frequent calculation. It must choose a time profile of forecasting horizons that adequately reflects the time structure of future cash flows and maturity of the contracts. For example, an institution may compute EE on a daily basis for the first ten days, once a week out to one month, once a month out to eighteen months, once a quarter out to five years and beyond five years in a manner that is consistent with the materiality and composition of the exposure.

54. Exposure must be measured out to the life of all contracts in the netting set (not just to the one year horizon), monitored and controlled. The institution must have procedures in place to identify and control the risks for counterparties where exposure rises beyond the one-year horizon. Moreover, the forecasted increase in exposure must be an input into the firm's internal economic capital model.

Stress testing

55. Institutions must have in place sound stress testing processes for use in the assessment of capital adequacy. These stress measures must be compared against the measure of EPE and considered by the institution as part of its internal capital adequacy assessment process. Stress testing must also involve identifying possible events or future changes in economic conditions that could have unfavourable effects on a firm's credit exposures and assessment of the firm's ability to withstand such changes. Examples of scenarios that could be used are; (i) economic or industry downturns, (ii) market-place events, or (iii) decreased liquidity conditions.

56. Institutions must stress test their counterparty exposures including jointly stressing market and credit risk factors. Stress tests of counterparty risk must consider concentration risk (to a single counterparty or groups of counterparties), correlation risk across market and credit risk (for example, a counterparty for which a large market move would result in a large exposure, a material deterioration in credit quality, or both), and the risk that liquidating the counterparty's positions could move the market. Such stress

tests must also consider the impact on the firm's own positions of such market moves and integrate that impact in its assessment of counterparty risk.

Wrong-way risk

57. Institutions must be aware of exposures that give rise to a greater degree of general wrong-way risk.

58. Institutions are said to be exposed to "specific wrong-way risk" if future exposure to a specific counterparty is expected to be high when the counterparty's probability of default is also high. For example, a company writing put options on its own stock creates wrong-way exposures for the buyer that is specific to the counterparty. An institution must have procedures in place to identify, monitor and control cases of specific wrong way risk, beginning at the inception of a trade and continuing through the life of the trade.

Integrity of Modeling Process

59. Other operational requirements focus on the internal controls needed to ensure the integrity of model inputs; specifically, the requirements address the transaction data, historical market data, frequency of calculation, and valuation models used in measuring EPE.

60. The internal model must reflect transaction terms and specifications in a timely, complete, and conservative fashion. Such terms include, but are not limited to, contract notional amounts, maturity, reference assets, collateral thresholds, margining arrangements, netting arrangements, etc. The terms and specifications must reside in a secure database that is subject to formal and periodic audit. The process for recognizing netting arrangements must require signoff by legal staff to verify the legal enforceability of netting and be input into the database by an independent unit. The transmission of transaction terms and specifications data to the internal model must also be subject to internal audit and formal reconciliation processes must be in place between the internal model and source data systems to verify on an ongoing basis that transaction terms and specifications are being reflected in EPE correctly, or at least conservatively.

61. The internal model must employ current market data to compute current exposures. When using historical data to estimate volatility and correlations, at least three years of historical data must be used and must be updated quarterly or more frequently if market conditions warrant. The data should cover a full range of economic conditions, such as a full business cycle. A unit independent from the business unit must validate the price supplied by the business unit. The data must be acquired independently of the lines of business, must be fed into the internal model in a timely and complete fashion, and maintained in a secure database subject to formal and periodic audit. Institutions must

also have a well-developed data integrity process to scrub the data of erroneous and/or anomalous observations. To the extent that the internal model relies on proxy market data, for example for new products where three years of historical data may not be available, internal policies must identify suitable proxies and the institution must demonstrate empirically that the proxy provides a conservative representation of the underlying risk under adverse market conditions. If the internal model includes the effect of collateral on changes in the market value of the netting set, the institution must have adequate historical data to model the volatility of the collateral.

62. The EPE model (and modifications made to it) must be subject to an internal model validation process. The process must be clearly articulated in firms' policies and procedures. The validation process must specify the kind of testing needed to ensure model integrity and identify conditions under which assumptions are violated and may result in an understatement of EPE. The validation process must include a review of the comprehensiveness of the EPE model, for example such as whether the EPE model covers all products that have a material contribution to counterparty risk exposures.

63. The use of an internal model to estimate EPE, and hence the exposure amount or EAD, of positions subject to a OCR capital charge will be conditional upon the explicit approval of the firm's supervisory authority. Home and host country supervisory authorities of banks that carry out material trading activities in multiple jurisdictions will work co-operatively to ensure an efficient approval process.

64. The Authority requires institutions seeking to make use of internal models to estimate EPE to meet appropriate requirements regarding, for example, the integrity of the risk management system, the skills of staff that will rely on such measures in operational areas and in control functions, the accuracy of models, and the rigour of internal controls over relevant internal processes. As an example, institutions seeking to make use of an internal model to estimate EPE must demonstrate that they meet the Basel Committee's general criteria for banks seeking to make use of internal models to assess market risk exposures, but in the context of assessing counterparty credit risk.

65. Where counterparty credit risks may not be fully covered by the Pillar 1 process, the Authority takes them into account in its Pillar 2 review.

66. No particular form of model is required to qualify to make use of an internal model. Although this text describes an internal model as a simulation model, other forms of models, including analytic models, are acceptable. Institutions that seek recognition for the use of an internal model that is not based on simulations must demonstrate that the model meets all operational requirements.

67. For an institution that qualifies to net transactions, there must be internal procedures to verify that, prior to including a transaction in a netting set, the transaction is covered by a legally enforceable netting contract that meets the applicable requirements of

paragraphs 96 to 100 of this Annex, the rules for credit risk mitigation techniques, or the Cross-Product Netting Rules set out in this Annex.

68. For an institution that makes use of collateral to mitigate its CCR, there must be internal procedures to verify that, prior to recognizing the effect of collateral in its calculations, the collateral meets the appropriate legal certainty standards as set out in Part 2, Section B iii) of this paper.

VI. Standardized Method

69. Institutions that do not have approval to apply the internal models method for the relevant OTC transactions may use the standardized method. The standardized method can be used only for OTC derivatives; SFTs are subject to the treatments set out under the Internal Model Method of this Annex or under Part 2, Section B iii) of this paper. The exposure amount (under the standardized approach for credit risk) or EAD is to be calculated separately for each netting set. It is determined as follows:

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exposure amount or EAD
$= \beta \cdot \max (CMV - CMC; \sum | \sum RPTij - \sum RPC_{lj} | \times CCF_j)$

where:

CMV = current market value of the portfolio of transactions within the netting set with a counterparty gross of collateral, i.e. $CMV = \sum_i CMC_l$, where CMV_l is the current market value of transaction i.

CMC = current market value of the collateral assigned to the netting set, i.e. $CMC = \sum CMC_l$, where CMC is the current market value of collateral 1.

i = index designating transaction.

l = index designating collateral.

j = index designating supervisory hedging sets. These hedging sets correspond to risk factors for which risk positions of opposite sign can be offset to yield a net risk position on which the exposure measure is then based.

RPT_{ij}; = Risk position from *transaction* i with respect to hedging set j

RPC_{li} = Risk position from collateral I with respect to hedging set j.[9]

CCF_j = Supervisory credit conversion factor with respect to the hedging set j[10]

B = Supervisory scaling parameter.

Collateral received from a counter party has a positive sign; collateral posted to a counter party has a negative sign.
Collateral that is recognized for the standardized approach is confined to the collateral that is eligible under paragraph 2 of Annex 2.7 and the relevant market risk treatment for credit risk mitigation.

70. When an OTC derivative transaction with linear risk profile (e.g. a forward, a future or a swap agreement) stipulates the exchange of a financial instrument (e.g. a bond, an equity, or a commodity) for a payment, the payment part is referred to as the payment leg. Transactions that stipulate the exchange of payment against payment (e.g. an interest rate swap or a foreign exchange forward) consist of two payment legs. The payment legs consist of the contractually agreed gross payments, including the notional amount of the transaction. Institutions may disregard the interest rate risk from payment legs with a remaining maturity of less than one year from the following calculations. Institutions may treat transactions that consist of two payment legs that are denominated in the same currency (e.g. interest rate swaps) as a single aggregate transaction. The treatment for payment legs applies to the aggregate transaction.

71. Transactions with linear risk profiles that have equity (including equity indices), gold, other precious metals or other commodities as the underlying financial instruments are mapped to a risk position in the respective equity (or equity index) or commodity (including gold and the other precious metals) hedging set. The payment leg of these transactions is mapped to an interest rate risk position within the appropriate interest rate hedging set. If the payment leg is denominated in a foreign currency, the transaction is also mapped to a foreign exchange risk position in the respective currency.

72. Transactions with linear risk profiles that have a debt instrument (e.g. a bond or a loan) as the underlying instrument are mapped to an interest rate risk positions with one risk position for the debt instrument and another risk position for the payment leg. Transactions with linear risk profiles that stipulate the exchange of payment against payment (including foreign exchange forwards) are mapped to an interest rate risk position for each of the payment legs. If the underlying debt instrument is denominated in a foreign currency, the debt instrument is mapped to a foreign exchange risk position in the respective currency. If a payment leg is denominated in a

[9] E.g. a short-term FX forward with one leg denominated in the firm's domestic currency will be mapped into three risk positions: 1. an FX risk position, 2. a foreign currency interest rate risk position, 3. a domestic currency risk position.
[10] Calibration has been made assuming at the money forwards or swaps and given a forecasting horizon of one year.

foreign currency, the payment leg is also mapped to a foreign exchange risk position in this currency.[11] The exposure amount or EAD assigned to a foreign exchange basis swap transactions is zero.

73. For all but debt instruments, the size of a risk position from a transaction with linear risk profile is the effective notional value (market price multiplied by quantity) of the underlying financial instruments (including commodities) converted to the firm's domestic currency.

74. For debt instruments and the payment legs of all transactions, the size of the risk position is the effective notional value of the outstanding gross payments (including the notional amount) converted to the firm's domestic currency, multiplied by the modified duration of the debt instrument or payment leg, respectively.

75. The size of a risk position from a credit default swap is the notional value of the reference debt instrument multiplied by the remaining maturity of the credit default swap.

76. The size of a risk position from an OTC derivative with non-linear risk profile (including options and swaptions) is equal to the delta equivalent effective notional value of the financial instrument that underlies the transaction, except in the case of an underlying debt instrument.

77. For OTC derivatives with non-linear risk profiles (including options and swaptions), for which the underlying is a debt instrument or a payment leg, the size of the risk position is equal to the delta equivalent effective notional value of the financial instrument or payment leg multiplied by the modified duration of the debt instrument or payment leg.

78. Institutions may use the following formulae to determine the size and sign of a risk position:

a. for all but debt instruments:

effective notional value, or delta equivalent notional value =

$$P_{ref} \frac{\partial V}{\partial p}$$

[11] E.g. a short-term FX forward with one leg denominated in the firm's domestic currency will be mapped into three risk positions: 1. an FX risk position, 2. a foreign currency interest rate risk position, 3. a domestic currency risk position.

where

P_{ref} = price of the underlying instrument, expressed in the reference currency

v = value of the financial instrument (in the case of an option: option price; in the case of a transaction with a linear risk profile: value of the underlying instrument itself)

p = price of the underlying instrument, expressed in the same currency as v

b. for debt instruments and the payment legs of all transactions:

effective notional value multiplied by the modified duration, or

delta equivalent in notional value multiplied by the modified duration

$$\frac{\partial V}{\partial p}$$

where

v = value of the financial instrument (in the case of an option: option price; in the case of a transaction with a linear risk profile: value of the underlying instrument itself or of the payment leg, respectively)

r = interest level

If v is denominated in a currency other than the reference currency, the derivative must be converted into the reference currency by multiplication with the relevant exchange rate.

79. The risk positions are to be grouped into hedging sets. For each hedging set, the absolute value amount of the sum of the resulting risk positions is computed. This sum is termed the "net risk position" and is represented as

$$| \sum RPT_{ij} - \sum RPC_{lj} |$$

in the formulae in paragraph 70 of this Annex.

80. Interest rate positions arising from debt instruments of low specific risk are to be mapped into one of six hedging sets for each represented currency. A debt instrument

is classified as being of low specific risk when it is subject to a 1.6 percent or lower capital charge according to the rules for specific issuer risk in the market risk provisions. Interest rate positions arising from the payment legs are to be assigned to the same hedging sets as interest rate risk positions from debt instruments of low specific risk. Interest rate positions arising from money deposits received from the counterparty as collateral are also to be assigned to the same hedging sets as interest rate risk positions from debt instruments of low specific risk. The six hedging sets per currency are defined by a combination of two criteria:

(i) The nature of the referenced interest rate - either a sovereign (government) rate or some other rate.

(ii) The remaining maturity or rate-adjustment frequency - less than one year, between one and five years, or longer than five years.

Table 1
Hedging Sets for Interest Rate Risk Positions Per Currency

Remaining maturity or rate-adjustment frequency	**Sovereign-referenced interest rates**	**Non-sovereign-referenced interest rates**
One year or less	X	X
Over one year to five years	X	X
Over five years	X	X

81. For underlying debt instruments (e.g. floating rate notes) or payment legs (e.g. floating rate legs of interest swaps) for which the interest rate is linked to a reference interest rate that represents a general market interest level (e.g. government bond yield, money market rate, swap rate), the rate-adjustment frequency is the length of the time interval up to the next re-adjustment of the reference interest rate. Otherwise, the remaining maturity is the remaining life of the underlying debt instrument, or, in the case of a payment leg, the remaining life of the transaction.

82. There is one hedging set for each issuer of a reference debt instrument that underlies a credit default swap.

83. There is one hedging set for each issuer of a debt instrument of high specific risk, i.e. debt instruments to which a capital charge of more than 1.60 percent applies under the standardized measurement method for interest rate risk in the Authority's market risk rules in Part 2, section D of this paper. The same applies to money deposits that are posted with a counterparty as collateral when that counterparty does not have debt obligations of low specific risk outstanding. When a payment leg emulates a debt instrument of high specific risk (e.g. in the case of a total return swap with one leg that emulates a bond), there is also one hedging set for each issuer of the reference debt instrument. Institutions may assign risk positions that arise from debt instruments of a

certain issuer or from reference debt instruments of the same issuer that are emulated by payment legs or that underlie a credit default swap to the same hedging set.

84. Underlying financial instruments other than debt instruments (equities, precious metals, commodities, other instruments), are assigned to the same respective hedging sets only if they are identical or similar instruments. The similarity of instruments is established as follows:

- For equities, similar instruments are those of the same issuer. An equity index is treated as a separate issuer.

- For precious metals, similar instruments are those of the same metal. A precious metal index is treated as a separate precious metal.

- For commodities, similar instruments are those of the same commodity. A commodity index is treated as a separate commodity.

- For electric power, delivery rights and obligations that refer to the same peak or off-peak load time interval within any 24 hour interval are similar instruments.

85. The credit conversion factor that is applied to a net risk position from a hedging set depends on the supervisory hedging set category as given in paragraphs 86 to 88 of this Annex.

86. The credit conversion factors for underlying financial instruments other than debt instruments and for foreign exchange rates are given in Table 2.

Table 2

Exchange Rates	**Gold**	**Equity**	**Precious Metals (except gold)**	**Electric Power**	**Other Commodities (excluding precious metals)**
2.5%	5.0%	7.0%	8.5%	4%	10.0%

87. The credit conversion factor for risk positions from debt instruments are as follows:

- 0.6 percent for risk positions from a debt instrument or reference debt instrument of high specific risk.

- 0.3 percent for risk position from a reference debt instrument that underlies a

credit default swap and that is of low specific risk.

- 0.2 percent otherwise.

88. Underlying instruments of OTC derivatives that are not in any of the categories above are assigned to separate individual hedging sets for each category of underlying instrument. A credit conversion factor of 10 percent is applied to the notional equivalent amount.

89. There may be transactions with a non-linear risk profile for which an institution cannot determine the delta with a model approved for the purposes for determining the minimum capital requirements for market risk (instrument models approved for the purposes of the standardized approach for market risk, or instrument models approved as part of the firm's admission to the internal modeling approach for market risk). In the case of payment legs and transactions with debt instruments as underlying, there may be transactions for which the institution cannot determine the modified duration with such a model. For these transactions, the Authority requires the use of the current exposure method. Netting will not be recognized: in other words, the exposure amount or EAD is to be determined as if there were a netting set that comprises just the individual transaction.

90. The supervisory scaling parameter β (beta) is set at 1.4.

VII. Current Exposure Method

91. Institutions that do not have approval to apply the internal models method may use the current exposure method as identified in Annex 2.9. The current exposure method is to be applied to OTC derivatives only; SFTs are subject to the treatments set out under the Internal Model Method of this Annex or under the credit risk mitigation rules in Part 2, section B iii) of the paper.

92 Under the Current Exposure Method, institutions must calculate the current replacement cost by marking contracts to market, thus capturing the current exposure without any need for estimation, and then adding a factor (the "add-on") to reflect the potential future exposure over the remaining life of the contract. In order to calculate the credit equivalent amount of these instruments under this current exposure method, institutions must sum:

- The total replacement cost (obtained by "marking to market") of all their contracts with positive value; and

- An amount for potential future credit exposure calculated on the basis of the total notional principal amount of the book, split by residual maturity as follows:

	Interest Rates	FX and Gold	Equities	Precious Metals Except Gold	Other Commodities
One year or less	0.0%	1.0%	6.0%	7.0%	10.0%
Over one year to five years	0.5%	5.0%	8.0%	7.0%	12.0%
Over five years	1.5%	7.5%	10.0%	8.0%	15.0%

Notes:

1. For contracts with multiple exchanges of principal, the factors are to be multiplied by the number of remaining payments in the contract.

2. For contracts that are structured to settle outstanding exposure following specified payment dates and where the terms are reset such that the market value of the contract is zero on these specified dates, the residual maturity would be set equal to the time until the next reset date. In the case of interest rate contracts with remaining maturities of more than one year that meet the above criteria, the add-on factor is subject to a floor of 0.5%.

3. Forwards, swaps, purchased options and similar derivative contracts not covered by any of the columns of this matrix are to be treated as "other commodities".

4. No potential future credit exposure would be calculated for single currency floating/floating interest rate swaps; the credit exposure on these contracts would be evaluated solely on the basis of their mark-to-market value.

93. The Authority seeks to ensure that the add-ons are based on effective rather than apparent notional amounts. In the event that the stated notional amount is leveraged or enhanced by the structure of the transaction, institutions must use the effective notional amount when determining potential future exposure. Institutions can obtain capital relief for collateral as defined in paragraph 2 of Annex 2.7 and the provisions for the treatment of counterparty credit risk in the trading book. The methodology for the recognition of eligible collateral follows that of the applicable approach for credit risk.

94. The counterparty credit risk exposure amount or EAD for single name credit derivative transactions in the trading book will be calculated using the potential future exposure add-on factors set out in for counterparty credit risk in the trading book rules.

95. To determine capital requirements for hedged banking book exposures, the

treatment for credit derivatives applies to qualifying credit derivative instruments.

96. Where a credit derivative is an n^{th}-to-default transaction (such as a first-to-default transaction), the treatment specified in the market risk rules applies.

Bilateral netting

97. Care is needed with bilateral netting arrangements in case a liquidator may have the right to unbundled netted contracts.[12] Accordingly, for capital adequacy purposes:

(a) Institution may net transactions subject to novation under which any obligation between the institution and its counterparty to deliver a given currency on a given value date is automatically amalgamated with all other obligations for the same currency and value date, legally substituting one single amount for the previous gross obligations.

(b) They may also net transactions subject to any legally valid form of bilateral netting not covered in (a), including other forms of novation.

(c) In both cases (a) and (b), the institution must satisfy the Authority that it has:

(i) A netting contract or agreement with the counterparty which creates a single legal obligation, covering all included transactions, such that the institution would have either a claim to receive or obligation to pay only the net sum of the positive and negative mark-to-market values of included individual transactions in the event a counterparty fails to perform due to any of the following: default, bankruptcy, liquidation or similar circumstances;

(ii) Written and reasoned legal opinions that, in the event of a legal challenge, the relevant courts and administrative authorities would find the institution's exposure to be such a net amount under:

- The law of the jurisdiction in which the counterparty is chartered and, if the foreign branch of a counterparty is involved, then also under the law of the jurisdiction in which the branch is located;
- The law that governs the individual transactions; and
- The law that governs any contract or agreement necessary to effect the netting.

[12] Payments netting, which is designed to reduce the operational costs of daily settlements, will not be recognized in the capital framework since the counterparty's gross obligations are not in any way affected.

The Authority, after consultation as necessary with other relevant supervisors, must be satisfied that the netting is enforceable under the laws of each of the relevant jurisdictions;

(iii) Procedures in place to ensure that the legal characteristics of netting arrangements are kept under review in the light of possible changes in relevant law.

98. Contracts containing walk-away clauses are not eligible for netting for the purpose of calculating capital requirements. A walk-away clause is a provision which permits a non-defaulting counterparty to make only limited payments, or no payment at all, to the estate of a defaulter, even if the defaulter is a net creditor.

99. Credit exposure on bilaterally netted forward transactions is calculated as the sum of the net mark-to-market replacement cost, if positive, plus an add-on based on the notional underlying principal. The add-on for netted transactions (A_{NET}) will equal the weighted average of the gross add-on (A_{Gross})[13] and the gross add-on adjusted by the ratio of net current replacement cost to gross current replacement cost (NGR). This is expressed through the following formula:

$$A_{Net}=0.4*A_{Gross}+0.6*NGR*A_{Gross}$$

where:

NGR=level of net replacement cost/level of gross replacement cost for transactions subject to legally enforceable netting agreements[14]

100. The scale of the gross add-ons to apply in this formula will be the same as those for non-netted transactions as set out in section VII of this Annex. The scale of add-ons remains under review internationally to make sure they are appropriate. For purposes of calculating potential future credit exposure to a netting counterparty for forward foreign exchange contracts and other similar contracts in which notional principal is equivalent to cash flows, notional principal is defined as the net receipts falling due on each value date in each currency. The reason for this is that offsetting contracts in the

[13] A_{Gross} equals the sum of individual add-on amounts (calculated by multiplying the notional principal amount by the appropriate add-on factors set out in paragraph 92 of this Annex) of all transactions subject to legally enforceable netting agreements with one counterparty.

[14] The Authority permits institutions to calculate the NGR on a counterparty by counterparty or on an aggregate basis for all transactions subject to legally enforceable netting agreements. However,, the method chosen by an institution must be used consistently. Under the aggregate approach, net negative current exposures to individual counterparties cannot be used to offset net positive current exposures to others, i.e. for each counterparty the net current exposure used in calculating the NGR is the maximum of the net replacement cost or zero. Note that under the aggregate approach, the NGR is to be applied individually to each legally enforceable netting agreement so that the credit equivalent amount will be assigned to the appropriate counterparty risk weight category.

same currency maturing on the same date will have lower potential future exposure as well as lower current exposure.

Risk weighting

101. Once an institution has calculated the credit equivalent amounts they are to be weighted according to the category of counterparty in the same way as in the main framework, including concessionary weighting in respect of exposures backed by eligible guarantees and collateral. The credit quality of participants in these markets remains under review internationally and the weights may be raised at a later stage if average credit quality deteriorates or if loss experience increases.

Annex 2.4

Capital Treatment for Failed Trades and Non-DvP Transactions

Overarching principles

1. Institutions are expected to continue to develop, implement and improve systems for tracking and monitoring the credit risk exposures arising from unsettled and failed transactions as appropriate for producing management information that facilitates action on a timely basis, pursuant to paragraphs 60 and 61 of Part 2 of this paper.

2. Transactions settled through a delivery-versus-payment system (DvP)[15], providing simultaneous exchanges of securities for cash, expose firms to a risk of loss on the difference between the transaction valued at the agreed settlement price and the transaction valued at current market price (i.e. positive current exposure). Transactions where cash is paid without receipt of the corresponding receivable (securities, foreign currencies, gold, or commodities) or, conversely, deliverables were delivered without receipt of the corresponding cash payment (non-DvP, or free-delivery) expose firms to a risk of loss on the full amount of cash paid or deliverables delivered. The current rules set out specific capital charges that address these two kinds of exposures.

3. The following capital treatment is applicable to all transactions on securities, foreign exchange instruments, and commodities that give rise to a risk of delayed settlement or delivery. This includes transactions through recognized clearing houses that are subject to daily mark-to-market and payment of daily variation margins and that involve a mismatched trade. Repurchase and reverse-repurchase agreements as well as securities lending and borrowing that have failed to settle are excluded from this capital treatment[16].

4. In cases of a system wide failure of a settlement or clearing system, the Authority may agree to waive capital charges until the situation is rectified.

5. Failure of a counterparty to settle a trade in itself will not be deemed a default for purposes of credit risk under the rules set out in this paper

6. In applying a risk weight to failed free-delivery exposures, institutions using the IRB approach for credit risk may assign PDs to counterparties for which they have no other banking book exposure on the basis of the counterparty's external rating. Those using the Advanced IRB approach may use a 45% LGD in lieu of estimating LGDs so long as they apply it to all failed trade exposures. Alternatively, institutions using the IRB approach may opt to apply the standardized approach risk weights or a 100% risk weight.

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[15] For the purpose of this Framework, DvP transactions include payment-versus-payment (PvP) transactions.

[16] All repurchase and reverse-repurchase agreements as well as securities lending and borrowing, including those that have failed to settle, are treated in accordance with Annex 2.3 or the sections on credit risk mitigation in this paper.

Capital requirements

7. For DvP transactions, if the payments have not yet taken place five business days after the settlement date, firms must calculate a capital charge by multiplying the positive current exposure of the transaction by the appropriate factor, according to the Table 1 below.

Table 1
Number of working days after the agreed settlement date/ Corresponding risk multiplier

From 5 to 15	8%
From 16 to 30	50%
From 31 to 45	75%
46 or more	100%

A reasonable transition period may be allowed for firms to upgrade their information system to be able to track the number of days after the agreed settlement date and calculate the corresponding capital charge.

8. For non-DvP transactions (i.e. free deliveries), after the first contractual payment/delivery leg, the institution that has made the payment will treat its exposure as a loan if the second leg has not been received by the end of the business day[17]. This means that an institution under the IRB approach will apply the appropriate IRB formula set out in this paper, for the exposure to the counterparty, in the same way as it does for all other banking book exposures. Similarly, banks under the standardized approach will use the standardized risk weights set forth in this Framework. However, when exposures are not material, institutions may choose to apply a uniform 100% risk-weight to these exposures, in order to avoid the burden of a full credit assessment. If five business days after the second contractual payment/delivery date the second leg has not yet effectively taken place, the institution that has made the first payment leg will deduct from capital the full amount of the value transferred plus replacement cost, if any. This treatment will apply until the second payment/delivery leg is effectively made.

[17] If the dates when two payment legs are made are the same according to the time zones where each payment is made, it is deemed that they are settled on the same day. For example, if a bank in Tokyo transfers Yen on day X (Japan Standard Time) and receives corresponding US Dollar via CHIPS on day X (US Eastern Standard Time), the settlement is deemed to take place on the same value date.

Annex 2.5

ECAIs- Implementation of the Mapping Process

1. In assigning eligible ECAIs' credit risk assessments to the risk weights available under the standardized approach, the Authority considers a range of qualitative and quantitative factors and seeks to differentiate between relative degrees of risk expressed by assessments. These qualitative factors include the pool of issuers covered by the ECAI, the range of ratings that it assigns, the meaning of each rating category and the definition of default employed by the ECAI, among other matters.

2. The Authority also seeks to evaluate the cumulative default rate (CDR) associated with all issues to which an ECAI has assigned a particular credit rating. In this regard, the Authority reviews two separate measures of the CDR associated with each risk rating, using in both cases the CDR measured over a three year period:

a) Where data exist, the ten year average of the three year CDR is reviewed, in order to gain a sense of the long-run default experience. Where less than ten years' default data is available, the Authority may be prepared to review ECAI estimates of expected 10 year averages of the three year CDR, and would thereafter review actual outcomes in light of these estimates; and

b) The most recent CDR for each credit risk category of the ECAI.

3. These measurements are compared with default experience with assessments issued by other rating institutions (in particular major ECAIs rating a similar population of issues), as well as with aggregated historical default rate data for credit risk assessments for deemed equivalent levels of credit risk that have been compiled internationally.

4. In mapping risk ratings to risk weights, for each step in an ECAI's rating scale, a ten year average of the three year CDR is compared to a long-run 'reference' three year CDR, offering a sense of long-run international default experience of risk assessments. Similarly, for each step in the ECAI rating scale, the two most recent three year CDRs are compared to 'benchmarks' for CDRs in order to seek to determine whether the ECAI's most recent record of assessing credit remains within the CDR supervisory benchmarks.

5. The long-run reference CDR provides information on international default experience for each credit risk category. However, the reference CDR acts only as a guide and not a target that an ECAI is required to meet.

TABLE A
Long-run reference three year CDRs

S&P	AAA-AA	A	BBB	BB	B
Moodys	Aaa-Aa	A	Baa	Ba	B
20 year average of three year CDR	0.10%	0.25%	1.0%	7.5%	20.00%

6. Where an ECAI's CDR exceeds a monitoring threshold in relation to the reference CDRs, the Authority needs to determine whether there may be a need to increase risk weights for a particular risk assessment rating or whether the outcome reflects some temporary cause other than weaker credit risk assessment standards. In reviewing such a scenario, the Authority begins by liaising with the ECAI concerned in order to determine why the default experience appears to be materially worse than the relevant benchmark. Where the Authority concludes that the result reflects weaker standards in assessing credit risk, it considers the need for assigning a higher risk category to the ECAI's credit risk assessment. Where the divergence above the benchmark level is particularly material, exceeding a 'trigger' level in relation to the reference CDRs, persisting over consecutive years, the Authority is particularly likely to conclude that credit risk assessments need to be moved up into a less favourable risk category. Alternatively, and particularly where the Authority decides to make no change in risk categories, it considers whether there is a need to require individual banks to hold additional capital, consistently with its approach to Pillar 2 of the Basel capital framework.

7. Where risk categories for an ECAI have been increased by the Authority as a result of poor CDR experience, it will consider restoring the earlier mapping where the ECAI can demonstrate that the three year CDR has fallen and remains more consistent with benchmark levels for two consecutive years.

8. For the calibration of benchmark CDRs, the Authority applies the following framework

S&P	AAA-AA	A	BBB	BB	B
Moodys	Aaa-Aa	A	Baa	Ba	B
Monitoring Threshold	0.8%	1.0%	2.4%	11.0%	28.6%
Trigger level	1.2%	1.3%	3.0%	12.4%	35.0%

Annex 2.6

Recognized ECAIs and related Mappings

A. Mapping of ECAI's Credit Assessments Risk Weightings

Standardized Approach – LONG TERM MAPPING

			Risk Weights			
Assessments					**Banks & Securities Firms (maturity)**	
S&P	**Moodys**	**Fitch**	**Sovereign**	**Corporate**	**Maturity>3mos**	**3 months or less**
AAA to AA-	Aaa to Aa3	AAA to AA-	0%	20%	20%	20%
A+ to A-	A1 to A3	A+ to A-	20%	50%	50%	20%
BBB+ to BBB-	Baa1 to Baa3	BBB+ to BBB-	50%	100%	50%	20%
BB+ to BB-	Ba1 to Ba3	BB+ to BB-	100%	100%	100%	50%
B+ to B-	B1 to B3	B+ to B-	100%	150%	100%	50%
CCC+ & below	Caa1 and below	CCC+ & below	150%	150%	150%	150%

B. Mapping of ECAI's Credit Assessments Risk Weightings

Standardized Approach – SHORT TERM MAPPING

Applied to exposures to banks, securities firms & corporate entities

Assessments			**Risk Weights**
S&P	Moodys	Fitch	
A-1+, A-1	P-1	F1+, F1	20%
A-2	P-2	F2	50%
A-3	P-3	F3	100%
All short term ratings Below A-3	Not Prime (NP)	Below F3	150%

Where a short-term rated facility attracts a 50% weight, unrated short-term claims cannot attract a risk weight that is lower than 100%. Where an issuer has a short-term facility with an assessment that warrants a risk weight of 150%, all unrated claims, whether long-term or short-term, should also receive a 150% weight, unless the institution uses recognized credit risk mitigation techniques for the claims.

C. Mapping of ECAI's Credit Assessments Risk Weightings

Collective Investment Undertakings (CIUs)

Assessments				Risk Weights
S&P – Principal Stability Fund Ratings	**S&P – Credit Quality Ratings**	**Fitch**	**Moodys**	
AAm to AA-m	AAAf to AA-f	AAA to AA-	Aaa to Aa3	20%
A+m to A-m	A+f to A-f	A+ to A-	A1 to A3	50%
BBB+m to BBB-m	BBB+f to BBB-f	BBB+ to BBB-	Baa1 to Baa3	100%
BB+m to BB-m	BB+f to BB-f	BB+ to BB-	Ba1 to Ba3	100%
B+m to B-m	B+f to B-f	B+ to B-	B1 to B3	150%
CCC+m and below	CCC+f and below	CCC+ and below	Caa1 and below	150%

There can be some minor differences in the rating scales applied by recognized ECAIs for CIU exposures. However, the basic mapping framework remains as for other exposures. Credit assessments for CIUs within the standardized approach are to be applied purely to fixed interest CIUs.

Annex 2.7

CRM - Eligible Financial Collateral

Simple Approach

1. The following collateral instruments are eligible for recognition in the Simple Approach:

a) **Cash** (as well as certificates of deposit or comparable instruments issued by the lending bank) on deposit with the bank that incurs the counterparty exposure.[18] [19] [20]

b) **Gold**

c) **Debt Securities rated** by a recognised external credit assessment institution where these are either:
- At least BB- when issued by sovereigns or PSEs that are treated as sovereigns by the national supervisor; or
- At least BBB- when issued by the other entities (including banks and securities firms); or
- At least A-3/ P-3 for short-term debt instruments.

d) **Debt Securities not rated** by a recognised external credit assessment institution where these are:
- Issued by a bank; and
- Listed on a recognised exchange; and
- Classified as senior debt; and
- All rated issues of the same seniority by the issuing bank must be rated at lease BBB- or A-3/ P-3 by a recognised external credit assessment institution; and
- The bank holding the securities as collateral has no information to suggest that the issue justifies a rating below BBB- or A-3/P-3 (as applicable); and
- The Authority is satisfied that there is adequate market liquidity for the security.

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[18] Cash funded credit linked notes issued by the bank against exposures in the banking book which fulfill the criteria for credit derivatives are treated as cash collateralised transactions.

[19] When cash on deposit, certificates of deposit or comparable instruments issued by the lending bank are held as collateral at a third party bank in a non-custodial arrangement, if they are openly pledged/ assigned to the lending bank and if the pledge/ assignment is unconditional and irrevocable, the exposure amount covered by the collateral (after any necessary haircuts for currency risk) can receive the risk weight of the third-party bank.

[20] However, the use or potential use by a UCITS/ mutual fund of derivative instruments solely to hedge investments listed in paragraphs 1 & 2 above does not prevent units in that UCITS/ mutual fund from being eligible financial collateral.

e) **Equities** (including convertible bonds) that are included in a main index.

f) **Undertakings for Collective Investments in Transferable Securities (UCITS) and Mutual Funds** where:

- A price for the units is publicly quoted daily; and
- The UCITS/ mutual fund is limited to investing in the instruments listed above.

Comprehensive Approach

2. The following collateral instruments are eligible for recognition in the Comprehensive Approach:

a) All of the instruments listed in paragraph 1 above;

b) Equities (including convertible bonds) which are not included in a main index but which are listed on a recognised exchange;

c) UCITS/ mutual funds that include such equities.

Annex 2.8

CRM - The Comprehensive Approach

1. Where the volatility-adjusted exposure amount is greater than the volatility-adjusted collateral amount (including any further adjustment for foreign exchange risk), institutions shall calculate their risk-weighted assets as the difference between the two multiplied by the risk weight of the counterparty. The framework for performing these calculations is set out in paragraphs 8-11, below.

2. In principle, institutions have two ways of calculating the haircuts: (i) standard supervisory haircuts, using parameters set out in paragraph 12 below, and (ii) own-estimate haircuts, using institutions' own internal estimates of market price volatility. The Authority permits institutions to use own-estimate haircuts only when they fulfill certain qualitative and quantitative criteria.

3. An institution may choose to use standard or own-estimate haircuts independently of the choice it has made between the standardised approach and the foundation IRB approach to credit risk. However, if institutions seek to use their own-estimate haircuts, they must do so for the full range of instrument types for which they would be eligible to use own-estimates, other than where the portfolios are not material, when they may use the standard supervisory haircuts.

4. The size of individual haircuts will depend on the type of instrument, type of transaction and the frequency of marking-to-market and re-margining. For example, repo-style transactions subject to daily marking-to-market and to daily re-margining receive a haircut based on a five-business day holding period and secured lending transactions with daily mark-to-market and no re-margining clauses receive a haircut based on a 20-business day holding period. These haircut numbers are scaled up using the square root of time formula depending on the frequency of the re-margining or marking-to-market.

5. The Authority does not permit the option of a zero haircut for repo-style transactions with defined core market participants.

6. The effect of master netting agreements covering repo-style transactions is recognised for the calculation of capital requirements subject to the conditions in paragraph 32 below.

7. As a further alternative to standard supervisory haircuts and own-estimate haircuts, institutions may use VaR models for calculating potential price volatility for repo-style transactions and other similar securities financing transactions (SFTs), as set out in paragraphs 37-40, below. Alternatively, subject to approval from the

Authority, they may also calculate, for these transactions, an expected positive exposure (EPE), in accordance with the rules established for counterparty credit risk in Annex 2.3.

Calculation of capital requirement

8. For a collateralised transaction, the exposure amount after risk mitigation is calculated as follows:

$$E^* = \max (0, [E \times (1 + He) - C \times (1 - Hc - Hfx)])$$

Where:

E^* = the exposure value after risk mitigation

E = current value of the exposure

He = haircut appropriate to the exposure

C = the current value of the collateral received

Hc = haircut appropriate to the collateral

Hfx = haircut appropriate for currency mismatch between the collateral and exposure

9. The exposure amount after risk mitigation is multiplied by the risk weight of the counterparty to obtain the risk-weighted asset amount for the collateralised transaction.

10. The treatment for transactions where there is a mismatch between the maturity of the counterparty exposure and the collateral is given in Part 2, section B (iii) (paragraphs 91-93) of the paper and in Annex 2.11.

11. Where the collateral is a basket of assets, the haircut on the basket is

$$H = \sum_i a_i H_i$$

Where:

a_i is the weight of the asset (as measured by units of currency) in the basket and H_i the haircut applicable to that asset.

Standard supervisory haircuts

12. These are the standard supervisory haircuts (assuming daily mark-to-market, daily re-margining and a 10-business day holding period), expressed as percentages:

Issue rating for debt securities	Residual Maturity	Sovereigns[21] [22]	Other issuers[23]
AAA to AA-/A-1	≤ 1 year	0.5	1
	> 1 year, ≤ 5 years	2	4
	> 5 years	4	8
A+ to BBB-/ A-2/ A-3/ P-3 and unrated bank securities per paragraph 1d of Appendix A	≤ 1 year	1	2
	> 1 year, ≤ 5 years	3	6
	> 5 years	6	12
BB+ to BB-	All	15	
Main index equities (including convertible Bonds) and Gold		15	
Other equities (including convertible bonds) listed on a recognised exchange		25	
UCITS/ Mutual Funds		Highest haircut applicable to any security in which the fund can invest	
Cash in the same currency[24]		0	

13. The standard supervisory haircut for currency risk where exposure and collateral are denominated in different currencies is 8% (also based on a 10-business day holding period and daily mark-to-market).

14. For transactions in which the institution lends non-eligible instruments (e.g. non-investment grade corporate debt securities), the haircut to be applied on the exposure should be the same as that for equity traded on a recognised exchange that is not part of a main index.

[21] Includes PSEs which are treated as sovereigns by the national supervisor.
[22] Multilateral development banks receiving a 0% risk weight are treated as sovereigns.
[23] Includes PSEs which are not treated as sovereigns by the national supervisor.
[24] Eligible cash collateral specified in Annex 2.7, paragraph 1a.

Own estimates for haircuts

15. The Authority may permit institutions to calculate haircuts using their own internal estimates of market price volatility and foreign exchange volatility. Permission to do so is conditional on the satisfaction of minimum qualitative and quantitative standards set out in paragraphs 17 to 26, below. When debt securities are rated BBB-/ A-3 or higher, the Authority permits institutions to calculate a volatility estimate for each category of security. In determining relevant categories, institutions must take into account (a) the type of issuer of the security, (b) its rating, (c) its residual maturity, and (d) its modified duration. Volatility estimates must be representative of the securities actually included in the category for that institution. For debt securities rated below BBB-/ A-3 or for equities eligible as collateral (lightly shaded boxes in the table above), the haircuts must be calculated individually for each security.

16. Institutions must estimate the volatility of the collateral instrument or foreign exchange mismatch individually: estimated volatilities for each transaction must not take into account the correlations between unsecured exposure, collateral and exchange rates (see paragraphs 91-93 of section B (iii) of this paper and Annex 2.11 for the approach to maturity mismatches).

Quantitative criteria

17. In calculating the haircuts, a 99^{th} percentile, one-tailed confidence interval is to be used.

18. The minimum holding period is dependent on the type of transaction and the frequency of re-margining or marking to market. The minimum holding periods for different types of transactions are set out in paragraph 28, below. Institutions may use haircut numbers calculated according to shorter holding periods, scaled up to the appropriate holding period by the square root of time formula.

19. Institutions must take into account the illiquidity of lower quality assets. The holding period must be adjusted upwards in cases where such a holding period would be inappropriate given the liquidity of the collateral. They should also identify where historical data may understate potential volatility, e.g. a pegged currency. Such cases must be dealt with by subjecting the data to stress testing.

20. The choice of historical observation period (sample period) for calculating haircuts must be a minimum of one year. For institutions that use a weighting scheme or other methods for the historical observation period, the "effective" observation period must be at least one year (that is, the weighted average time lag of the individual observations cannot be less than six months).

21. Institutions must update their data sets no less frequently than once every three months and should also reassess them whenever market prices are subject to material changes. This implies that haircuts must be computed at least every three months. The Authority may also require an institution to calculate its haircuts using a shorter observation period if, in the judgment of the Authority, this becomes justified by a significant upsurge in price volatility.

22. No particular type of model is prescribed. So long as each model used captures all the material risks run by the institution, institutions will be free to use models based on, for example, historical simulations and Monte Carlo simulations.

Qualitative criteria

23. The estimated volatility data (and holding period) must be used in the day-to-day risk management process of the institution.

24. Institutions must have robust processes in place for ensuring compliance with a documented set of internal policies, controls and procedures concerning the operation of the risk measurement system.

25. The risk measurement system must be used in conjunction with internal exposure limits.

26. An independent review of the risk measurement system must be carried out regularly in the institution's own internal auditing process. A review of the overall risk management process should take place at regular intervals (ideally not less than once a year) and should specifically address, at a minimum:

    a) The integration of risk measures into daily risk management;
    b) The validation of any significant change in the risk measurement process;
    c) The accuracy and completeness of position data;
    d) The verification of the consistency, timeliness and reliability of data sources used to run internal models, including the independence of such data sources; and
    e) The accuracy and appropriateness of volatility assumptions

Adjustment for different holding periods and non-daily mark-to-market or re-margining

27. For some transactions, depending on the nature and frequency of the revaluation and re-margining provisions, different holding periods are appropriate. The framework for collateral haircuts distinguishes between repo-style transactions (i.e. repo/ reverse repos and securities lending/ borrowing), "other capital-market-driven transactions" (i.e. OTC derivatives transactions and margin lending) and secured

lending. In capital-market-driven transactions and repo-style transactions, the documentation contains re-margining clauses; in secured lending transactions, it generally does not.

28. The minimum holding period for various products is summarized in the following table:

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

29. When the frequency of re-margining or revaluation is longer than the minimum, the minimum haircut numbers is scaled up depending on the actual number of business days between re-margining or revaluation using the square root of time formula below:

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

Where:
H = haircut
H_M = haircut under the minimum holding period
T_M = minimum holding period for the type of transaction
N_R = actual number of business days between re-margining for capital market transactions or revaluation for secured transactions

When an institution calculates the volatility on a T_N day holding period that is different from the specified minimum holding period T_M, the H_M will be calculated using the square root of time formula:

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

T_N = Holding period used by the institution for deriving H_N
H_N = Haircut based on the holding period T_N

30. For example, for institutions using the standard supervisory haircuts, the 10-business day haircuts provided in paragraph 12 above provide the basis, and this haircut is scaled up or down depending on the type of transaction and the frequency of re-margining or re-valuation using the formula below:

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

Where:

H = haircut
H_{10} = 10-business day standard supervisory haircut for instrument
N_R = actual number of business days between re-margining for capital market transactions or re-valuation for secured transactions
T_M = minimum holding period for the type of transaction

Conditions for zero H

31. The Authority does not provide the zero haircut option.

Treatment of repo-style transactions covered under master netting agreements

32. The effects of bilateral netting agreements covering repo-style transactions will be recognised on a counterparty-by-counterparty basis if the agreements are legally enforceable in each relevant jurisdiction upon the occurrence of an event of default and regardless of whether the counterparty is insolvent or bankrupt. In addition, netting agreements must:

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

b) Provide for the netting of gains and losses on transactions (including the value of any collateral) terminated and closed out under it so that a single net amount is owed by one party to the other;

c) Allow for the prompt liquidation or setoff of collateral upon the event of default; and

d) Be, together with the rights arising from the provisions required in (a) to (c) above, legally enforceable in each relevant jurisdiction upon the occurrence of an event of default and regardless of the counterparty's insolvency or bankruptcy

33. Netting across positions in the banking and trading book is only recognised when the netted transactions fulfill the following conditions:

a) All transactions are marked-to-market daily[25], and

b) The collateral instruments used in the transactions are recognised as eligible financial collateral in the banking book.

[25] The holding period for the haircuts will depend, as in other repo-style transactions, on the frequency of margining.

34. The formula in paragraph 8 above is adapted to calculate the capital requirements for transactions with netting agreements.

35. For institutions using the standard supervisory haircuts or own-estimate haircuts, the framework below applies, to take into account the impact of master netting agreements.

$$E^* = \max (0, [(\sum (E) - \sum(C)) + \sum (E_S \times H_S) + \sum (Efx \times Hfx)])$$[26]

Where:
E^* = the exposure value after risk mitigation
E = current value of the exposure
C = the value of the collateral received
E_S = absolute value of the net position in a given security
H_S = haircut appropriate to E_S
Efx = absolute value of the net position in a currency different from the settlement currency
Hfx = haircut appropriate for currency mismatch

36. The intention is to obtain a net exposure amount after netting of the exposures and collateral and to have an add-on amount reflecting possible price changes for the securities involved in the transactions and for foreign exchange risk, if any. The net long or short position of each security included in the netting agreement is multiplied by the appropriate haircut. All other rules regarding the calculation of haircuts set out in paragraphs 8-31 above, equivalently apply for institutions using bilateral netting agreements for repo-style transactions.

Use of models

37. As an alternative to the use of standard or own-estimate haircuts, institutions may use a VaR models approach to reflect the price volatility of the exposure and collateral for repo-style transactions, taking into account correlation effects between security positions. This approach applies to repo-style transactions covered by bilateral netting agreements on a counterparty-by-counterparty basis. The VaR model approach may also be used for margin lending transactions where transactions are covered by a bilateral master netting agreement that meets the requirements of paragraphs 32-34, above. The VaR models approach is available to institutions that have received supervisory recognition for an internal market risk model. Where institutions have not received such model recognition, they may apply separately for supervisory recognition to use their VaR models for calculation of potential price volatility for repo-style transactions. Internal models will only be accepted when an institution can prove the quality of its model through the backtesting of its output using one year of historical data. Institutions must meet the Authority's model validation requirements in order to use VaR for repo-style and

[26] The starting point for this formula is the formula in paragraph 8 above, which can also be presented as the following: $E^* = \max (0, [(E - C) + (E \times He) + (C \times Hc) + (C \times Hfx)])$.

other SFTs. In addition, other transactions similar to repo-style transactions (like prime brokerage) and that meet the requirements for repo-style transactions, are also eligible to use the VaR models approach provided the model used meets the Authority's operational requirements.

38. The quantitative and qualitative criteria for recognition of internal market risk models for repo-style transactions and other similar transactions are in principle the same as are applied by the Authority for models recognition more generally. However, the minimum holding period is 5-business days for repo-style transactions. For other transactions eligible for the VaR models approach, the 10-business day holding period is retained. The minimum holding period should be adjusted upwards for market instruments where such a holding period would be inappropriate given the liquidity of the instrument concerned.

39. The calculation of the exposure E* for institutions using their internal model is the following:

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

    In calculating capital requirements, institutions will use the previous business day's VaR number.

40. Subject to approval from the Authority, instead of using the VaR approach, institutions may also calculate an expected positive exposure for repo-style and other similar SFTs, in accordance with the Internal Model Method set out in Annex 2.3.

Annex 2.9

CRM - Collateralised OTC Derivatives Transactions

1. Under the Current Exposure Method, the calculation of the counterparty credit risk charge for an individual contract is as follows:

   Counterparty charge = $[(RC + \text{add-on}) - C_A] \times r \times 8\%$

   Where:

   RC = the replacement cost

   Add-on = the amount for potential future exposure calculated according to the Current Exposure Method for OTC derivatives set out in Annex 2.3,

   C_A = the volatility-adjusted collateral amount under the Comprehensive Approach prescribed in Annex 2.8, or zero if no eligible collateral is applied to the transaction, and

   r = the risk weight of the counterparty

2. When effective bilateral netting contracts are in place, RC will be the net replacement cost and the add-on will be A_{NET} as calculated according to the Current Exposure Method for bilateral netting, set out in Annex 2.3. The haircut for currency risk (Hfx) should be applied when there is a mismatch between the collateral currency and the settlement currency. Even in the case where there are more than two currencies involved in the exposure, collateral and settlement currency, a single haircut assuming a 10-business day holding period scaled up as necessary depending on the frequency of mark-to-market is applied.

3. As an alternative to the Current Exposure Method for the calculation of the counterparty credit risk charge, institutions may also use the Standardised Method and, subject to approval by the Authority, the Internal Model Method as set out in Annex 2.3.

Annex 2.10

CRM - Guarantees & Credit Derivatives

Additional Operational Requirements for guarantees

1. In addition to the legal certainty requirements in section paragraph 79 (b) of Part 2, section B (iii) of this paper, in order for a guarantee to be recognized, the following conditions must be satisfied:

a) On the qualifying default/ non-payment of the counterparty, the institution may in a timely manner pursue the guarantor for any monies outstanding under the documentation governing the transaction. The guarantor may make one lump sum payment of all monies under such documentation to the institution, or the guarantor may assume the future payment obligations of the counterparty covered by the guarantee. The institution must have the right to receive any such payments from the guarantor without first having to take legal actions in order to pursue the counterparty for payment.

b) The guarantee is an explicitly documented obligation assumed by the guarantor.

c) Except as noted in the following sentence, the guarantee covers all types of payments the underlying obligor is expected to make under the documentation governing the transaction, for example notional amount, margin payments, etc. Where the guarantee covers payment of principal only, interests and other uncovered payments should be treated as an unsecured amount in accordance with paragraph 9 below.

Additional Operational Requirements for credit derivatives

2. In order for a credit derivative contract to be recognised, the following conditions must be satisfied:

a) The credit events specified by the contracting parties must at a minimum cover:

- Failure to pay the amounts due under terms of the underlying obligation that are in effect at the time of such failure (with a grace period that is closely in line with the grace period in the underlying obligation);

- Bankruptcy, insolvency or inability of the obligor to pay its debts, or its failure or admission in writing of its inability generally to pay its debts as they come due, and analogous events; and

- Restructuring of the underlying obligation involving forgiveness or postponement of principal, interest or fees that results in a credit loss event (i.e. charge-off, specific provision or other similar debit to the profit and loss account). When restructuring is not specified as a credit event, refer to paragraph 3, below.

b) If the credit derivative covers obligations that do not include the underlying obligation, section (g) below governs whether the asset mismatch is permissible.

c) The credit derivative shall not terminate prior to expiration of any grace period required for a default on the underlying obligation to occur as a result of a failure to pay, subject to the provisions of section 9 (b) of this paper.

d) Credit derivatives allowing for cash settlement are recognised for capital purposes insofar as a robust valuation process is in place in order to estimate loss reliably. There must be a clearly specified period for obtaining post-credit-event valuations of the underlying obligation. If the reference obligation specified in the credit derivative for purposes of cash settlement is different from the underlying obligation, section (g) below governs whether the asset mismatch is permissible.

e) If the protection purchaser's right/ability to transfer the underlying obligation to the protection provider is required for settlement, the terms of the underlying obligation must provide that any required consent to such transfer may not be unreasonably withheld.

f) The identity of the parties responsible for determining whether a credit event has occurred must be clearly defined. This determination must not be the sole responsibility of the protection seller. The protection buyer must have the right/ability to inform the protection provider of the occurrence of a credit event.

g) A mismatch between the underlying obligation and the reference obligation under the credit derivative (i.e. the obligation used for purposes of determining cash settlement value or the deliverable obligation) is permissible if (1) the reference obligation ranks pari passu with or is junior to the underlying obligation, and (2) the underlying obligation and reference obligation share the same obligor (i.e. the same legal entity) and legally enforceable cross-default or cross-acceleration clauses are in place.

h) A mismatch between the underlying obligation and the obligation used for purposes of determining whether a credit event has occurred is permissible if (1) the latter obligation ranks pari passu with or is junior to the underlying obligation, and (2) the underlying obligation and reference obligation share the same obligor (i.e. the same legal entity) and legally enforceable cross-default or cross-acceleration clauses are in place.

3. When the restructuring of the underlying obligation is not covered by the credit derivative, but the other requirements in paragraph 2, above, are met, partial recognition of the credit derivative will be allowed. If the amount of the credit derivative is less than or equal to the amount of the underlying obligation, 60% of the amount of the hedge can be recognised as covered. If the amount of the credit derivative is larger than that of the underlying obligation, then the amount of eligible hedge is capped at 60% of the amount of the underlying obligation.[27]

4. Only credit default swaps and total return swaps that provide credit protection equivalent to guarantees will be eligible for recognition. The following exception applies. Where an institution buys credit protection through a total return swap and records the net payments received on the swap as net income, but does not record the offsetting deterioration in the value of the asset that is protected (either through reductions in fair value or by an addition to reserves), the credit protection will not be recognised. The treatment of first-to-default and second-to-default products is covered separately in Annex 2.12.

5. Other types of credit derivatives are not eligible for recognition at this time.[28]

Range of eligible guarantors (counter-guarantors)/ protection providers

6. Credit protection given by the following entities is recognised:

- Sovereign entities[29], PSEs, banks[30] and securities firms with a lower risk weight than the counterparty;

- Other entities rated A- or better. This includes credit protection provided by parent, subsidiary and affiliate companies when they have a lower risk weight than the obligor.

[27] The 60% recognition factor is provided as an interim treatment.
[28] Cash funded credit-linked notes issued by the institution against exposures in the banking book which fulfill the criteria for credit derivatives are treated as cash collateralised transactions.
[29] This includes the Bank for International Settlements, the International Monetary Fund, the European Central Bank and the European Community, as well as those MDBs granted a 0% weight in the Authority's capital measurement framework paper.
[30] This includes MDBs not falling within footnote 17 above.

Risk weights

7. The protected portion is assigned the risk weight of the protection provider. The uncovered portion of the exposure is assigned the risk weight of the underlying counterparty.

8. Materiality thresholds on payments below which no payment is made in the event of loss are equivalent to retained first loss positions and must be deducted in full from the capital of the bank purchasing the credit protection.

Proportional cover

9. Where the amount guaranteed, or against which credit protection is held, is less than the amount of the exposure, and the secured and unsecured portions are of equal seniority, i.e. the institution and the guarantor share losses on a pro-rata basis, capital relief will be afforded on a proportional basis: i.e. the protected portion of the exposure receives the treatment applicable to eligible guarantees/ credit derivatives, with the remainder treated as unsecured.

Tranched cover

10. Where the institution transfers a portion of the risk of an exposure in one or more tranches to a protection seller or sellers and retains some level of risk of the loan and the risk transferred and the risk retained are of different seniority, institutions may obtain credit protection for either the senior tranches (e.g. second loss portion) or the junior tranche (e.g. first loss portion). In this case the provisions set out in the Authority's rules relating to credit risk securitization apply.

Currency mismatches

11. Where the credit protection is denominated in a currency different from that in which the exposure is denominated – i.e. there is a currency mismatch – the amount of the exposure deemed to be protected will be reduced by the application of a haircut H_{FX}, i.e.

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

Where:
G = nominal amount of the credit protection
H_{FX} = haircut appropriate for currency mismatch between the credit protection and underlying obligation.

The appropriate haircut based on a 10-business day holding period (assuming daily marking-to-market) will be applied. If a bank uses the supervisory haircuts it will be 8%. The haircuts must be scaled up using the square root of time formula, depending on the frequency of revaluation of the credit protection as described in Annex 2.8, paragraph 29.

Sovereign guarantees and counter-guarantees

12. The Authority has confirmed that it makes use of the option for a lower risk weight to be applied to an institution's exposures to the sovereign (or central bank) where the bank is incorporated and where the exposure is denominated in domestic currency and funded in that currency. This treatment also extends to portions of claims guaranteed by the Government of Bermuda, where the guarantee is denominated in the domestic currency and the exposure is funded in that currency. A claim may be covered by a guarantee that is indirectly counter-guaranteed by a sovereign. Such a claim may be treated as covered by a sovereign guarantee, provided that:

a) The sovereign counter-guarantee covers all credit risk elements of the claim;

b) Both the original guarantee and the counter-guarantee meet all operational requirements for guarantees, except that the counter-guarantee need not be direct and explicit to the original claim; and

c) The supervisor is satisfied that the cover is robust and that no historical evidence suggests that the coverage of the counter-guarantee is less than effectively equivalent to that of a direct sovereign guarantee.

Annex 2.11

Maturity Mismatch

Risk Weights for Maturity Mismatches

1. As outlined in paragraphs 91 and 92 in Part 2, section B (iii) of this paper, hedges with maturity mismatches are only recognized when their original maturities are greater than or equal to one year. As a result, the maturity of hedges for exposures with original maturities of less than one year must be matched to be recognized. In all cases, hedges with maturity mismatches are no longer recognized when they have a residual maturity of three months or less.

2. When there is a maturity mismatch with recognized credit risk mitigants (collateral, on-balance sheet netting, guarantees and credit derivatives) the following adjustment is applied:

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

Where:

Pa = value of the credit protection adjusted for maturity mismatch

P = credit protection (e.g., collateral amount, guarantee amount) adjusted for any haircuts

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

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

Annex 2.12

Other Points Related to the Treatment of CRM

First-to-default credit derivatives

1. There are cases where an institution obtains credit protection for a basket of reference names and where the first default among the reference names triggers the credit protection and the credit event also terminates the contract. In this case, the institution may recognize regulatory capital relief for the asset within the basket with the lowest risk-weighted amount, but only if the notional amount is less than or equal to the notional amount of the credit derivative.

2. With regard to the institution providing credit protection through such an instrument, if the product has an external credit assessment from an eligible credit assessment institution, the appropriate risk weight applying to securitization tranches will be applied. If the product is not rated by an eligible external credit assessment institution, the risk weights of the assets included in the basket will be aggregated up to a maximum amount of 1250% and multiplied by the nominal amount of the protection provided by the credit derivative to obtain the risk-weighted asset amount.

Second-to-default credit derivatives

3. In the case where the second default among the assets within the basket triggers the credit protection, the institution obtaining credit protection through such a product will only be able to recognize any capital relief if first-default-protection has also been obtained or when one of the assets within the basket has already defaulted.

4. For institutions providing credit protection through such a product, the capital treatment is the same as in paragraph 2, above with one exception. The exception is that, in aggregating the risk weights, the asset with the lowest risk weighted amount can be excluded from the calculation.

Annex 2.13

CREDIT RISK – SECURITIZATION
Internal ratings-based approach for securitization exposures

Scope

1. Institutions that have received approval to use the IRB approach for the type of underlying exposures securitized (e.g., for their corporate or retail portfolio) must use the IRB approach for securitizations. Conversely, institutions may not use the IRB approach to securitization unless they receive approval to use the IRB approach for the underlying exposures from the Authority.

2. If an institution is using the IRB approach for some exposures and the standardized approach for other exposures in the underlying pool, it should generally use the approach corresponding to the predominant share of exposures within the pool. The institution should consult with the Authority on which approach to apply to its securitization exposures. To ensure appropriate capital levels, there may be instances where the Authority requires a treatment other than this general rule.

3. Where there is no specific IRB treatment for the underlying asset type, originating institutions that have received approval to use the IRB approach must calculate capital charges on their securitization exposures using the standardized approach in the securitization framework, and investing banks with approval to use the IRB approach must apply the RBA.

Hierarchy of approaches

4. The Ratings-Based Approach (RBA) must be applied to securitization exposures that are rated, or where a rating can be inferred as described in paragraph 12, below. Where an external or an inferred rating is not available, either the Supervisory Formula (SF) or the Internal Assessment Approach (IAA) must be applied. The IAA is only available to exposures (e.g., liquidity facilities and credit enhancements) that institutions (including third-party institutions) extend to ABCP programs. Such exposures must satisfy the conditions of paragraphs 14 and 15, below. For liquidity facilities to which none of these approaches can be applied, institutions may apply the treatment specified in paragraph 34, below. Exceptional treatment for eligible servicer cash advance facilities is specified in paragraph 36, below. Securitization exposures to which none of these approaches can be applied must be deducted.

Maximum capital requirement

5. For an institution using the IRB approach to securitization, the maximum capital requirement for the securitization exposures it holds is equal to the IRB capital

requirement that would have been assessed against the underlying exposures had they not been securitized and treated under the appropriate sections of the IRB framework including the rules for the treatment of expected losses and recognition of provisions. In addition, institutions must deduct the entire amount of any gain-on-sale and credit enhancing I/Os arising from the securitization transaction in accordance with paragraphs 27 to 29, below.

Ratings-Based Approach (RBA)

6. Under the RBA, the risk-weighted assets are determined by multiplying the amount of the exposure by the appropriate risk weights, provided in the tables below.

7. The risk weights depend on (i) the external rating grade or an available inferred rating, (ii) whether the credit rating (external or inferred) represents a long-term or a short-term credit rating, (iii) the granularity of the underlying pool and (iv) the seniority of the position.

8. For purposes of the RBA, a securitization exposure is treated as a senior tranche if it is effectively backed or secured by a first claim on the entire amount of the assets in the underlying securitized pool. While this generally includes only the most senior position within a securitization transaction, in some instances there may be some other claim that, in a technical sense, may be more senior in the hierarchy (e.g., a swap claim) but may be disregarded for the purpose of determining which positions are subject to the "senior tranches" column.

Examples:

(a) In a typical synthetic securitization, the "super-senior" tranche would be treated as a senior tranche, provided that all of the conditions for inferring a rating from a lower tranche are fulfilled.

(b) In a traditional securitization where all tranches above the first-loss piece are rated, the most highly rated position would be treated as a senior tranche. However, when there are several tranches that share the same rating, only the most senior one in the waterfall would be treated as senior.

(c) Usually a liquidity facility supporting an ABCP program would not be the most senior position within the program; the commercial paper, which benefits from the liquidity support, typically would be the most senior position. However, if the liquidity facility is sized to cover all of the outstanding commercial paper, it can be viewed as covering all losses on the underlying receivables pool that exceed the amount of over-collateralization/ reserves provided by the seller and as being most senior. As a result, the RBA risk weights in the left-most column can be used for such positions. On the other hand, if a liquidity or credit enhancement

facility constituted a mezzanine position in economic substance rather than a senior position in the underlying pool, then the "Base risk weights" column is applicable.

9. The risk weights provided in the first table below apply when the external assessment represents a long-term credit rating, as well as when an inferred rating based on a long-term rating is available.

10. Institutions may apply the risk weights for senior positions if the effective number of underlying exposures (N, as defined in paragraph 28, below) is 6 or more and the position is senior as defined above. When N is less than 6, the risk weights in column 4 of the first table below apply. In all other cases, the risk weights in column 3 of the first table below apply.

RBA risk weights when the external assessment represents a long-term credit rating and/ or an inferred rating derived from a long-term assessment

External Rating (Illustrative)	Risk weights for senior positions and eligible senior IAA exposures	Base risk Weights	Risk weights for tranches backed by non-granular pools
AAA	7%	12%	20%
AA	8%	15%	25%
A+	10%	18%	35%
A	12%	20%	
A-	20%	35%	
BBB+	35%	50%	
BBB	60%	75%	
BBB-	100%		
BB+	250%		
BB	425%		
BB-	650%		
Below BB- and unrated	Deduction		

11. The risk weights in the table below apply when the external assessment represents a short-term credit rating, as well as when an inferred rating based on a short-term rating is available. The decision rules outlined in paragraph 10, above also apply for short-term credit ratings.

RBA risk weights when the external assessment represents a short-term credit rating and/ or an inferred rating derived from a short-term assessment

External Rating (Illustrative)	Risk weights for senior positions and eligible senior IAA exposures	Base risk weights	Risk weights for tranches backed by non-granular pools
A-1/ P-1	7%	12%	20%
A-2/ P-2	12%	20%	35%
A-3/ P-3	60%	75%	75%
All other ratings/unrated	Deduction	Deduction	Deduction

Use of inferred ratings

12. When the following minimum operational requirements are satisfied an institution must attribute an inferred rating to an unrated position. These requirements are intended to ensure that the unrated position is senior in all respects to an externally rated securitization exposure termed the 'reference securitization exposure'.

Operational requirements for inferred ratings

13. The following operational requirements must be satisfied to recognize inferred ratings.

(a) The reference securitization exposure (e.g., ABS) must be subordinate in all respects to the unrated securitization exposure. Credit enhancements, if any, must be taken into account when assessing the relative subordination of the unrated exposure and the reference securitization exposure. For example, if the reference securitization exposure benefits from any third-party guarantees or other credit enhancements that are not available to the unrated exposure, then the latter may not be assigned an inferred rating based on the reference securitization exposure.

(b) The maturity of the reference securitization exposure must be equal to or longer than that of the unrated exposure.

(c) On an ongoing basis, any inferred rating must be updated continuously to reflect any changes in the external rating of the reference securitization exposure.

(d) The external rating of the reference securitization exposure must satisfy the general requirements for recognition of external ratings as delineated in paragraph 31, below.

Internal Assessment Approach (IAA)

14. An institution may use its internal assessments of the credit quality of the securitization exposures relating to ABCP programs (e.g., liquidity facilities and credit enhancements) provided its internal assessment process meet the operational requirements below. Internal assessments of exposures provided to ABCP programs must be mapped to equivalent external ratings of an ECAI. Those rating equivalents are used to determine the appropriate risk weights under the RBA for purposes of assigning the notional amounts of the exposures.

15. An institution's internal assessment process must meet the following operational requirements in order to use internal assessments in determining the IRB capital requirement arising from liquidity facilities, credit enhancements, or other exposures extended to an ABCP program:

(a) For the unrated exposure to qualify for the IAA, the ABCP must be externally rated. The ABCP itself is subject to the RBA.

(b) The internal assessment of the credit quality of a securitization exposure to the ABCP program must be based on an ECAI criteria for the asset type purchased and must be the equivalent of at least investment grade when initially assigned to an exposure. In addition, the internal assessment must be used in the institution's internal risk management processes, including management information and economic capital systems, and generally must meet all the relevant requirements of the IRB framework.

(c) In order for institutions to use the IAA, the Authority must be satisfied (i) that the ECAI meets the ECAI eligibility criteria as set out in the Authority's standard criteria for the use of ECAI ratings and (ii) with the ECAI rating methodologies used in the process. In addition, institutions have the responsibility to demonstrate to the satisfaction of the Authority how these internal assessments correspond with the standards of the relevant ECAI. For instance, when calculating the credit enhancement level in the context of the IAA, the Authority may, if warranted, disallow on a full or partial basis any seller-provided recourse guarantees or excess spread, or any other first loss credit enhancements that provide limited protection to the institution.

(d) The institution's internal assessment process must identify gradations of risk. Internal assessments must correspond to the external ratings of ECAIs so that the Authority can determine which internal assessment corresponds to each external rating category of the ECAIs.

(e) The institution's internal assessment process, particularly the stress factors for determining credit enhancement requirements, must be at least as conservative as the publicly available rating criteria of the major ECAIs that are externally rating the ABCP program's commercial paper for the asset type being purchased by the program. However, the institutions should consider, as appropriate, all publicly available ECAI ratings methodologies in developing their internal assessments.

- In the case where (i) the commercial paper issued by an ABCP program is externally rated by two or more ECAIs and (ii) the different ECAIs' benchmark stress factors require different levels of credit enhancement to achieve the same external rating equivalent, the institution must apply the ECAI stress factor that requires the most conservative or highest level of credit protection. For example, if one ECAI required enhancement of 2.5 to 3.5 times historical losses for an asset type to obtain a single A rating equivalent and another required 2 to 3 times historical losses, the institution must use the higher range of stress factors in determining the appropriate level of seller-provided credit enhancement.

- When selecting ECAIs to externally rate an ABCP, an institution must not choose only those ECAIs that generally have relatively less restrictive rating methodologies. In addition, if there are changes in the methodology of one of the selected ECAIs, including the stress factors, that adversely affect the external rating of the program's commercial paper, then the revised rating methodology must be considered in evaluating whether the internal assessments assigned to ABCP program exposures are in need of revision.

- An institution cannot utilize an ECAI's rating methodology to derive an internal assessment if the ECAI's process or rating criteria is not publicly available. However, institutions should consider the non-publicly available methodology—to the extent that they have access to such information—in developing their internal assessments, particularly if it is more conservative than the publicly available criteria.

- In general, if the ECAI rating methodologies for an asset or exposure are not publicly available, then the IAA may not be used. However, in certain instances, for example, for new or uniquely structured transactions, which are not currently addressed by the rating criteria of an ECAI rating the program's commercial paper, an institution may discuss the specific transaction with the Authority to determine whether the IAA may be applied to the related exposures.

(f) Internal or external auditors, an ECAI, or the institution's internal credit review or risk management function must perform regular reviews of the internal assessment process and assess the validity of those internal assessments. If the institution's internal audit, credit review, or risk management functions perform the reviews of the internal assessment process, then these functions must be

independent of the ABCP program business line, as well as the underlying customer relationships.

(g) The institution must track the performance of its internal assessments over time to evaluate the performance of the assigned internal assessments and make adjustments, as necessary, to its assessment process when the performance of the exposures routinely diverges from the assigned internal assessments on those exposures.

(h) The ABCP program must have credit and investment guidelines, i.e. underwriting standards, for the ABCP program. In the consideration of an asset purchase, the ABCP program (i.e. the program administrator) should develop an outline of the structure of the purchase transaction. Factors that should be discussed include the type of asset being purchased; type and monetary value of the exposures arising from the provision of liquidity facilities and credit enhancements; loss waterfall; and legal and economic isolation of the transferred assets from the entity selling the assets.

(i) A credit analysis of the asset seller's risk profile must be performed and should consider, for example, past and expected future financial performance, current market position; expected future competitiveness; leverage, cash flow, interest coverage; and debt rating. In addition, a review of the seller's underwriting standards, servicing capabilities, and collection processes should be performed.

(j) The ABCP program's underwriting policy must establish minimum asset eligibility criteria that, among other things,

- exclude the purchase of assets that are significantly past due or defaulted;
- limit excess concentration to individual obligor or geographic area; and
- limit the tenor of the assets to be purchased.

(k) The ABCP program should have collections processes established that consider the operational capability and credit quality of the servicer. The program should mitigate to the extent possible seller/ servicer risk through various methods, such as triggers based on current credit quality that would preclude co-mingling of funds and impose lockbox arrangements that would help ensure the continuity of payments to the ABCP program.

(l) The aggregate estimate of loss on an asset pool that the ABCP program is considering purchasing must consider all sources of potential risk, such as credit and dilution risk. If the seller-provided credit enhancement is sized based on only credit-related losses, then a separate reserve should be established for dilution risk, if dilution risk is material for the particular exposure pool. In addition, in sizing the required enhancement level, the institution should review several years of historical information, including losses, delinquencies, dilutions, and the

turnover rate of the receivables. Furthermore, the institution should evaluate the characteristics of the underlying asset pool, e.g., weighted average credit score, identify any concentrations to an individual obligor or geographic region, and the granularity of the asset pool.

(m) The ABCP program must incorporate structural features into the purchase of assets in order to mitigate potential credit deterioration of the underlying portfolio. Such features may include wind down triggers specific to a pool of exposures.

16. The notional amount of the securitization exposure to the ABCP program must be assigned to the risk weight in the RBA appropriate to the credit rating equivalent assigned to the bank's exposure.

17. If an institution's internal assessment process is no longer considered adequate, the Authority may preclude the institution from applying the internal assessment approach to its ABCP exposures, both existing and newly originated, for determining the appropriate capital treatment until the institution has remedied the deficiencies. In this instance, the institution must revert to the Supervisory Formula (as defined in paragraph 19 below) or, if not available, to the method described in paragraph 34, below.

Supervisory Formula (SF)

18. As in the IRB approaches, risk-weighted assets generated through the use of the SF are calculated by multiplying the capital charge by 12.5. Under the SF, the capital charge for a securitization tranche depends on five bank-supplied inputs: the IRB capital charge if the underlying exposures had not been securitized (K_{IRB}); the tranche's credit enhancement level (L) and thickness (T); the pool's effective number of exposures (N); and the pool's exposure-weighted average loss-given-default (LGD). The inputs K_{IRB}, L, T, and N are defined below. The capital charge is calculated as follows:

(1) Tranche's IRB capital charge = the amount of exposures that have been securitized times the greater of (a) 0.0056 x T or (b) (S[L+T] – S [L]),

where the function S[.] (termed the 'Supervisory Formula') is defined in the following paragraph. When the bank holds only a proportional interest in the tranche, that position's capital charge equals the prorated share of the capital charge for the entire tranche.

19. The Supervisory Formula is given by the following expression:

$$(2)\quad S[L] = \begin{cases} L & \text{when } L \leq K_{IRB} \\ K_{IRB} + K[L] - K[K_{IRB}] + (d \cdot K_{IRB}/w)(1-e^{w(K_{IRB}-L)/K_{IRB}}) & \text{when } K_{IRB} < L \end{cases}$$

where

$h=(1- K_{IRB} /LGD)^N$

$c= K_{IRB} /(1-h)$

$v=\dfrac{(LGD-K_{IRB} +0.25(1-LGD)\, K_{IRB}}{N}$

$f= \left\{ v + K_{IRB}^{\,2} /1-h \quad -C^2 \right\} + (1- K_{IRB})\, K_{IRB} - v/ (1-h)\Gamma$

$g= \dfrac{(1-c)\, c}{f} -1$

$a=g \cdot c$

$b= g \cdot (1-c)$

$d=1-(1-h) \cdot (1-\text{Beta}[K_{IRB} ; a, b])$

$K[L]=(1-h) \cdot ((1-\text{Beta}[L; a,b])L + \text{Beta}[L; a+1, b]c).$

20. In these expressions, Beta [L; a,b] refers to the cumulative beta distribution with parameters a and b evaluated at L.[31]

21. The Authority-determined parameters in the above expressions are as follows:

$\Gamma = 1000$, and $w = 20$

Definition of K_{IRB}

22. K_{IRB} is the ratio of (a) the IRB capital requirement including the EL portion for the underlying exposures in the pool to (b) the exposure amount of the pool (e.g. the sum of drawn amounts related to securitized exposures plus the EAD associated with un-drawn

[31] The cumulative beta distribution function is available, for example, in Excel as the function BETADIST.

commitments related to securitized exposures). Quantity (a) above must be calculated in accordance with the applicable minimum IRB standards (as set out in the Authority's rules for the use of the IRB approach) as if the exposures in the pool were held directly by the institution. This calculation should reflect the effects of any credit risk mitigant that is applied on the underlying exposures (either individually or to the entire pool), and hence benefits all of the securitization exposures. K_{IRB} is expressed in decimal form (e.g. a capital charge equal to 15% of the pool would be expressed as 0.15). For structures involving an SPE, all the assets of the SPE that are related to the securitizations are to be treated as exposures in the pool, including assets in which the SPE may have invested a reserve account, such as a cash collateral account.

23. If the risk weight resulting from the SF is 1250%, institutions must deduct the securitization exposure subject to that risk weight in accordance with paragraphs 27 to 29, below.

24. In cases where an institution has set aside a specific provision or has a non-refundable purchase price discount on an exposure in the pool, quantity (a) defined above and quantity (b) also defined above must be calculated using the gross amount of the exposure without the specific provision and/or non-refundable purchase price discount. In this case, the amount of the non-refundable purchase price discount on a defaulted asset or the specific provision can be used to reduce the amount of any deduction from capital associated with the securitization exposure.

Credit enhancement level (L)

25. L is measured (in decimal form) as the ratio of (a) the amount of all securitization exposures subordinate to the tranche in question to (b) the amount of exposures in the pool. Institutions will be required to determine L before considering the effects of any tranche-specific credit enhancements, such as third-party guarantees that benefit only a single tranche. Any gain-on-sale and/or credit enhancing I/Os associated with the securitization are not to be included in the measurement of L. The size of interest rate or currency swaps that are more junior than the tranche in question may be measured at their current values (without the potential future exposures) in calculating the enhancement level. If the current value of the instrument cannot be measured, the instrument should be ignored in the calculation of L.

26. If there is any reserve account funded by accumulated cash flows from the underlying exposures that is more junior than the tranche in question, this can be included in the calculation of L. Unfunded reserve accounts may not be included if they are to be funded from future receipts from the underlying exposures.

Thickness of exposure (T)

27. T is measured as the ratio of (a) the nominal size of the tranche of interest to (b) the notional amount of exposures in the pool. In the case of an exposure arising from an

interest rate or currency swap, the institution must incorporate potential future exposure. If the current value of the instrument is non negative, the exposure size should be measured by the current value plus the add-on set out in the Current Exposure Method for OTC derivatives. If the current value is negative, the exposure should be measured by using the potential future exposure only.

Effective number of exposures (N)

28. The effective number of exposures is calculated as:

$$(3) \qquad N = \frac{(\sum_i EAD_i)^2}{\sum_i EAD_i^2}$$

where EAD_i represents the exposure-at-default associated with the i^{th} instrument in the pool. Multiple exposures to the same obligor must be consolidated (i.e. treated as a single instrument). In the case of re-securitization (securitization of securitization exposures), the formula applies to the number of securitization exposures in the pool and not the number of underlying exposures in the original pools. If the portfolio share associated with the largest exposure, C_1, is available, the bank may compute N as $1/C_1$.

Exposure-weighted average LGD

29. The exposure-weighted average LGD is calculated as follows:

$$(4) \qquad LGD = \frac{\sum_i EAD_i \cdot EAD_i}{\sum_i EAD_i}$$

where LGD_1 represents the average LGD associated with all exposures to the i^{th} obligor. In the case of re-securitization, an LGD of 100% must be assumed for the underlying securitized exposures. When default and dilution risks for purchased receivables are treated in an aggregate manner (e.g., a single reserve or over-collateralization is available to cover losses from either source) within a securitization, the LGD input must be constructed as a weighted-average of the LGD for default risk and the 100% LGD for dilution risk. The weights are the stand-alone IRB capital charges for default risk and dilution risk, respectively.

Simplified method for computing N and LGD

30. For securitizations involving retail exposures, subject to review by the Authority, the SF may be implemented using the simplifications: h=0 and v=0.

31. Under the conditions provided below, institutions may employ a simplified method for calculating the effective number of exposures and the exposure-weighted average LGD. Let C_m in the simplified calculation denote the share of the pool corresponding to the sum of the largest 'm' exposures (e.g., a 15% share corresponds to a value of 0.15). The level of m is set by each institution.

- If the portfolio share associated with the largest exposure, C_1 , is no more than 0.03 (or 3% of the underlying pool), then for purposes of the SF, the institution may set LGD =0.50 and N equal to the following amount:

(5) $$N=\left(C_1\, C_m+\left(C_m-C_{1/m-1}\right)\max\{1-m\, C_1, O\}\right)^{-1}$$

- Alternatively, if only C_1 is available and this amount is no more than 0.03, then the institution may set LGD=0.50 and $N=1/C_1$.

Liquidity facilities

32. Liquidity facilities are treated as any other securitization exposure and receive a CCF of 100% unless specified differently in paragraphs 33 to 36, below. If the facility is externally rated, the institution may rely on the external rating under the RBA. If the facility is not rated and an inferred rating is not available, the institution must apply the SF, unless the IAA can be applied.

33. An eligible liquidity facility that can only be drawn in the event of a general market disruption as defined in paragraph 134 of Part 2 of this paper is assigned a 20% CCF under the SF. That is, an IRB institution is to recognize 20% of the capital charge generated under the SF for the facility. If the eligible facility is externally rated, the institution may rely on the external rating under the RBA provided it assigns a 100% CCF rather than a 20% CCF to the facility.

34. When it is not practical for the institution to use either the bottom-up approach or the top-down approach for calculating K_{IRB}, the institution may, on an exceptional basis and subject to the Authority's consent, be permitted as a temporary measure to apply the following method. If the liquidity facility meets the definition in paragraph 132 or 134 of Part 2, section B (iv) of this paper, the highest risk weight assigned under the standardized approach to any of the underlying individual exposures covered by the liquidity facility can be applied to the liquidity facility. If the liquidity facility meets the definition in paragraph 132, the CCF must be 50% for a facility with an original maturity of one year or less, or 100% if the facility has an original maturity of more than one year. If the liquidity facility meets the definition in paragraph 134, the CCF must be 20%. In all other cases, the notional amount of the liquidity facility must be deducted.

Treatment of overlapping exposures

35. Overlapping exposures are treated as described in section B (iv), paragraph 135.

Eligible servicer cash advance facilities

36. Eligible servicer cash advance facilities are treated as specified in section B(iv), paragraph 136.

Treatment of credit risk mitigation for securitization exposures

37. As with the RBA, institutions are required to apply the CRM techniques as specified in the rules governing the foundation IRB approach when applying the SF. The institution may reduce the capital charge proportionally when the credit risk mitigant covers first losses or losses on a proportional basis. For all other cases, the institution must assume that the credit risk mitigant covers the most senior portion of the securitization exposure (i.e., that the most junior portion of the securitization exposure is uncovered). Examples for recognizing collateral and guarantees under the SF are provided in Annex 2.14

Capital requirement for early amortization provisions

38. An originating institution must use the methodology and treatment described in section B (iv), paragraphs 144-155 for determining if any capital must be held against the investors' interest. For institutions using the IRB approach to securitization, investors' interest is defined as investors' drawn balances related to securitization exposures and EAD associated with investors' undrawn lines related to securitization exposures. For determining the EAD, the undrawn balances of securitized exposures would be allocated between the seller's and investors' interests on a pro-rata basis, based on the proportions of the seller's and investors' shares of the securitized drawn balances. For IRB purposes, the capital charge attributed to the investors' interest is determined by the product of (a) the investors' interest, (b) the appropriate CCF, and (c) K_{IRB}.

Annex 2.14

Illustrative Examples: Calculating the Effect of Credit Risk Mitigation under Supervisory Formula

Some examples are provided below for determining how collateral and guarantees are to be recognized under the Supervisory Formula (SF).

Illustrative Example Involving Collateral — proportional cover

Assume an originating bank purchases a $100 securitization exposure with a credit enhancement level in excess of KIRB for which an external or inferred rating is not available. Additionally, assume that the SF capital charge on the securitization exposure is $1.6 (when multiplied by 12.5 results in risk weighted assets of $20). Further assume that the originating bank has received $80 of collateral in the form of cash that is denominated in the same currency as the securitization exposure. The capital requirement for the position is determined by multiplying the SF capital requirement by the ratio of adjusted exposure amount and the original exposure amount, as illustrated below.

Step 1: Adjusted Exposure Amount (E*) = max {0, [Ex(1+He)-Cx(1-Hc-Hfx)]}

E* = max {0, [100x(1+0)-80x(1-0-0)]} = $20

where (based on the information provided above):

E* = the exposure value after risk mitigation ($20)
E = current value of the exposure ($100)
He = haircut appropriate to the exposure (This haircut is not relevant because the originating bank is not lending the securitization exposure in exchange for collateral).
C = the current value of the collateral received $80)
H_c = haircut appropriate to the collateral (0)
Hfx = haircut appropriate for mismatch between the collateral and exposure (0)

Step 2: Capital requirement= (E* / E) x SF capital requirement

where (based on the information provide above):

Capital requirement = $20 / $100 x $1.6 = $0.32.

Illustrative Example Involving a Guarantee — proportional cover

All of the assumptions provided in the illustrative example involving collateral apply except for the form of credit risk mitigant. Assume that the bank has received an eligible,

unsecured guarantee in the amount of $80 from a bank. Therefore, a haircut for currency mismatch will not apply. The capital requirement is determined as follows.

- The protected portion of the securitization exposure ($80) is to receive the risk weight of the protection provider. The risk weight for the protection provider is equivalent to that for an unsecured loan to the guarantor bank, as determined under the IRB approach. Assume that this risk weight is 10%. Then, the capital charge on the protected portion would be: $80 x 10% x 0.08 = $0.64.

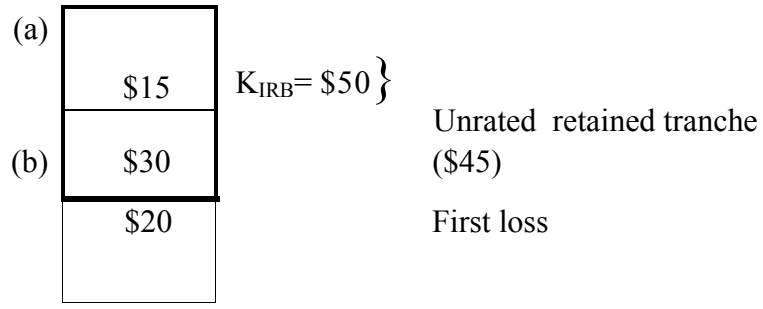
- The capital charge for the unprotected portion ($20) is derived by multiplying the capital charge on the securitization exposure by the share of the unprotected portion to the exposure amount. The share of the unprotected portion is: $20 / $100 = 20%. Thus, the capital requirement will be: $1.6 x 20% = $0.32.

The total capital requirement for the protected and unprotected portions is:

$0.64 (protected portion) + $0.32 (unprotected portion) = $0.96.

Illustrative example: the case of credit risk mitigants covering the most senior parts of the underlying loan pool

Assume an originating bank that securitizes a pool of loans of $1,000. The K_{IRB} of this underlying pool is 5% (capital charge of $50). There is a first loss position of $20. The originator retains only the second most junior tranche: an unrated tranche of $45. We can summarize the situation as follows:



1. Capital charge without collateral or guarantees

According to this example, the capital charge for the unrated retained tranche that is straddling the K_{IRB} line is the sum of the capital requirements for tranches (a) and (b) in the graph above:

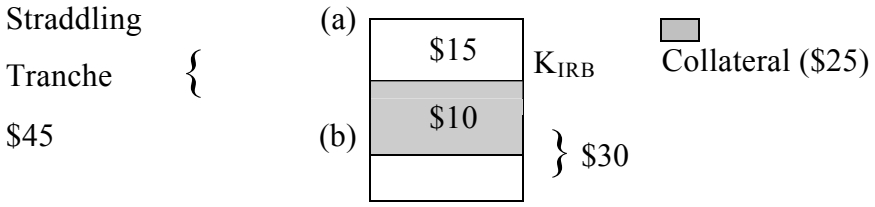
(a) Assume the SF risk weight for this sub-tranche is 820%. Thus, risk-weighted assets are $15 x 820% = $123. Capital charge is $123 x 8%= $9.84

(b) The sub-tranche below K_{IRB} must be deducted. Risk-weighted assets: \$30 x 1250% = \$375. Capital charge of \$375 x 8% = \$30

Total capital charge for the unrated straddling tranche = \$9.84 + \$30 = \$39.84

2. Capital charge with collateral

Assume now that the originating bank has received \$25 of collateral in the form of cash that is denominated in the same currency as the securitization exposure. Because the tranche is straddling the K_{IRB} level, we must assume that the collateral is covering the most senior sub-tranche above K_{IRB} ((a) sub-tranche covered by \$15 of collateral) and, only if there is some collateral left, the coverage must be applied to the sub-tranche below K_{IRB} beginning with the most senior portion (e.g. tranche (b) covered by \$10 of collateral). Thus, we have:



The capital requirement for the position is determined by multiplying the SF capital requirement by the ratio of adjusted exposure amount and the original exposure amount, as illustrated below. We must apply this for the two sub-tranches.

(a) The first sub-tranche has an initial exposure of \$15 and collateral of \$15, so in this case it is completely covered. In other words:

Step 1: Adjusted Exposure Amount

$$E^* = \max \{0, [Ex(1+He)-Cx(1-Hc-Hfx)]\}=\max\{0, [15-15]\}= \$0$$

where:

E* = the exposure value after risk mitigation (\$0)
E = current value of the exposure (\$15)
C = the current value of the collateral received (\$15)
He = haircut appropriate to the exposure (not relevant here, thus 0)
Ho and Hfx = haircut appropriate to the collateral and that for the mismatch between the collateral and exposure (to simplify, 0)

Step 2: Capital requirement = (E*/E)xSF capital requirement

Capital requirement = 0 x $9.84 = $0

(b) The second sub-tranche has an initial exposure of $30 and collateral of $10, which is the amount left after covering the sub-tranche above K_{IRB}. Thus, these $10 must be allocated to the most senior portion of the $30 sub-tranche.

Step 1: Adjusted Exposure Amount

E* = max {0, [30 x (1 + 0) — 10 x (1 — 0 — 0)]} = $20

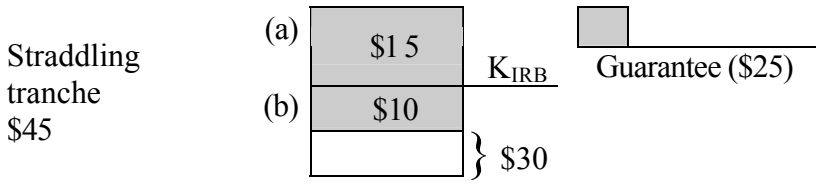
Step 2: Capital requirement = (E*/E)x SF capital requirement

Capital requirement = $20 / $30 x $30 = $20

Finally, the total capital charge for the unrated straddling tranche = $0 + $20 = $20

3. Guarantee

Assume now that instead of collateral, the bank has received an eligible, unsecured guarantee in the amount of $25 from a bank. Therefore the haircut for currency mismatch will not apply. The situation can be summarized as:



The capital requirement for the two sub-tranches is determined as follows:

(a) The first sub-tranche has an initial exposure of $15 and a guarantee of $15, so in this case it is completely covered. The $15 will receive the risk weight of the protection provider. The risk weight for the protection provider is equivalent to that for an unsecured loan to the guarantor bank, as determined under the IRB approach. Assume that this risk weight is 20%.

Capital charge on the protected portion is $15 x 20% x 8% = $0.24

(b) The second sub-tranche has an initial exposure of $30 and guarantee of $10 which must be applied to the most senior portion of this sub-tranche. Accordingly, the protected part is $10 and the unprotected part is $20.

- Again, the protected portion of the securitization exposure is to receive the risk weight of the guarantor bank.

  Capital charge on the protected portion is \$10 x 20% x 8% = \$0.16

  The capital charge for the unprotected portion (for an unrated position below K_{IRB}) is \$20 x 1250% x 8% = \$20

Total capital charge for the unrated straddling tranche = \$0.24 (protected portion, above K_{IRB}) + \$0.16 (protected portion, below K_{IRB}) + \$20 (unprotected portion, below K_{IRB}) = \$20.4

Annex 2.15

Mapping of Business Lines

Level 1	Level 2	Activity Groups
Corporate Finance	Corporate Finance	Mergers and acquisitions, underwriting, privatizations, securitization, research, debt (government, high yield), equity, syndications, IPO, secondary private placements
	Municipal/ Government Finance	
	Merchant Banking	
	Advisory Services	
Trading & Sales	Sales	Fixed income, equity, foreign exchanges, commodities, credit, funding, own position securities, lending and repos, brokerage, debt, prime brokerage
	Market Making	
	Proprietary Positions	
	Treasury	
Retail Banking	Retail Banking	Retail lending and deposits, banking services, trust and estates
	Private Banking	Private lending and deposits, banking services, trust and estates, investment advice
	Card Services	Merchant/commercial/corporate cards, private labels and retail
Commercial Banking	Banking Commercial	Project finance, real estate, export finance, trade finance, factoring, leasing, lending, guarantees, bills of exchange
Payment and Settlement*	External Clients	Payments and collections, funds transfer, clearing and settlement
Agency Services	Custody	Escrow, depository receipts, securities lending (customers) corporate actions
	Corporate Agency	Issuer and paying agents
	Corporate Trust	
Asset Management	Discretionary Fund Management	Pooled, segregated, retail, institutional, closed, open, private equity
	Non-Discretionary Fund Management	Pooled, segregated, retail, institutional, closed, open
Retail Brokerage	Retail Brokerage	Execution and full service

* Payment and settlement losses related to an institution's own activities would be incorporated in the loss experience of the affected business line.

Principles for business line mapping

(a) All activities must be mapped into the eight level 1 business lines in a mutually exclusive and jointly exhaustive manner.

(b) Any banking or non-banking activity which cannot be readily mapped into the business line framework, but which represents an ancillary function to an activity included in the framework, must be allocated to the business line it supports. If more than one business line is supported through the ancillary activity, an objective mapping criteria must be used.

(c) When mapping gross income, if an activity cannot be mapped into a particular business line then the business line yielding the highest charge must be used. The same business line equally applies to any associated ancillary activity.

(d) Banks may use internal pricing methods to allocate gross income between business lines provided that total gross income for the bank (as would be recorded under the Basic Indicator Approach) still equals the sum of gross income for the eight business lines.

(e) The mapping of activities into business lines for operational risk capital purposes must be consistent with the definitions of business lines used for regulatory capital calculations in other risk categories, i.e. credit and market risk. Any deviations from this principle must be clearly motivated and documented.

(f) The mapping process used must be clearly documented. In particular, written business line definitions must be clear and detailed enough to allow third parties to replicate the business line mapping. Documentation must, among other things, clearly motivate any exceptions or overrides and be kept on record.

(g) Processes must be in place to define the mapping of any new activities or products.

(h) Senior management is responsible for the mapping policy (which is subject to the approval by the board of directors).

(i) The mapping process to business lines must be subject to independent review.

Supplementary business line mapping guidance

There are a variety of valid approaches that institutions can use to map their activities to the eight business lines, provided the approach used meets the business line mapping principles. The following is an example of one possible approach that could be used to map gross income:

Gross income for retail banking consists of net interest income on loans and advances to retail customers and SMEs treated as retail, plus fees related to traditional retail activities, net income from swaps and derivatives held to hedge the retail banking book, and income on purchased retail receivables. To calculate net interest income for retail banking, an institution takes the interest earned on its loans and advances to retail customers less the weighted average cost of funding of the loans (from whatever source - retail or other deposits).

Similarly, gross income for commercial banking consists of the net interest income on loans and advances to corporate (plus SMEs treated as corporate), inter-bank and sovereign customers and income on purchased corporate receivables, plus fees related to traditional commercial banking activities including commitments, guarantees, bills of exchange, net income (e.g. from coupons and dividends) on securities held in the banking book, and profits/losses on swaps and derivatives held to hedge the commercial banking book. Again, the calculation of net interest income is based on interest earned on loans and advances to corporate, inter-bank and sovereign customers less the weighted average cost of funding for these loans (from whatever source).

For trading and sales, gross income consists of profits/losses on instruments held for trading purposes (i.e. in the mark-to-market book), net of funding cost, plus fees from wholesale broking.

For the other five business lines, gross income consists primarily of the net fees/commissions earned in each of these businesses. Payment and settlement consists of fees to cover provision of payment/settlement facilities for wholesale counterparties. Asset management is management of assets on behalf of others.

Annex 2.16
Detailed Loss Event Type Classification

Event-Type Category (Level 1)	Definition	Categories (Level 2)	Activity Examples
Internal fraud	Losses due to acts of a type intended to defraud, misappropriate property or circumvent regulations the law or company policy, excluding diversity/ discrimination events, which involves at least one internal party	Unauthorized Activity	Transactions not reported (intentional) Transaction type unauthorized (w/ monetary loss) Mis-marking of position (intentional)
		Theft and Fraud	Fraud / credit fraud / worthless deposits Theft / extortion / embezzlement / robbery Misappropriation of assets Malicious destruction of assets Forgery Check kiting Smuggling Account take-over / impersonation / etc. Tax non-compliance 0 evasion (willful) Bribes / kickbacks Insider trading (not on firm's account)
External fraud	Losses due to acts of a type intended to defraud, misappropriate property or circumvent the law, by a third party	Theft and Fraud	Theft/Robbery, Forgery Check kiting
		Systems Security	Hacking damage Theft of information (w/ monetary loss)
Employment Practices Workplace Safety	Losses arising from acts inconsistent with employment, health or safety laws or agreements, from payment of personal injury claims, or from diversity / discrimination events	Employee Relations	Compensation, benefit, termination issues Organized labor activity
		Safe Environment	General liability (slip and fall, etc.) Employee health & safety rules events Workers compensation
		Diversity & Discrimination	All discrimination types

Event-Type Category (Level 1)	Definition	Categories (Level 2)	Activity Examples (Level 3)
Clients, Products & Business Practices	Losses arising from an unintentional or negligent failure to meet a professional obligation to specific clients (including fiduciary and suitability requirements), or from the nature or design of a product.	Suitability, Disclosure & Fiduciary	Fiduciary breaches / guideline violations Suitability / disclosure issues (KYC, etc.) Retail customer disclosure violations Breach of privacy Aggressive sales Account churning Misuse of confidential information Lender liability
		Improper Business or Market	Antitrust Improper trade / market practices Market manipulation Insider trading (on firm's account) Unlicensed activity Money laundering
		Product Flaws	Product defects (unauthorized, etc.) Model errors
		Selection, Sponsorship & Exposure	Failure to investigate client per guidelines Exceeding client exposure limits
		Advisory Activities	Disputes over performance of advisory activities
Damage to Physical Assets	Losses arising from loss or damage to physical assets from natural disaster or other events.	Disasters and other events	Natural disaster losses Human losses from external sources (terrorism, vandalism)
Business disruption and Failures	Losses arising from disruption of business or system failures	Systems	Hardware Software Telecommunications Utility outage / disruptions

Event-Type Category (Level 1)	Definition	Categories (Level 2)	Activity Examples (Level 3)
Execution, Delivery & Process Management	Losses from failed transaction processing or process management, from relations with trade counterparties and vendors	Transaction Capture, Execution & Maintenance	Miscommunication Data entry, maintenance or loading error Missed deadline or responsibility Model / system mis-operation Accounting error / entity attribution error Other task mis-performance Delivery failure Collateral management failure Reference Data Maintenance
		Monitoring and Reporting	Failed mandatory reporting obligation Inaccurate external report (loss incurred)
		Customer Intake and documentation	Client permissions / disclaimers missing Legal documents missing / incomplete
		Customer / Client Account	Unapproved access given to accounts Incorrect client records (loss incurred) Negligent loss or damage of client assets
		Trade Counterparties	Non-client counterparty mis-performance Misc. non-client counterparty disputes
		Vendors & Suppliers	Outsourcing Vendor disputes

Annex 2.17

Overview of Methodologies for the Capital Treatment of Transactions Secured by Financial Collateral under the Standardized and IRB Approaches

1. The rules set out in the standardized approach - Credit Risk Mitigation (CRM), for collateralised transactions generally determine the treatment under both the standardized and the foundation internal ratings-based (IRB) approaches for claims in the banking book that are secured by financial collateral of sufficient quality. Institutions using the advanced IRB approach will typically take financial collateral on banking book exposures into account by using their own internal estimates to adjust the exposure's loss given default (LGD). One exception for institutions using the advanced IRB approach pertains to the recognition of repo-style transactions which are governed by a master netting agreement (see below).

2. Collateralised exposures that take the form of repo-style transactions (i.e. repo/reverse repos and securities lending/borrowing) are subject to special considerations. Such transactions that are held in the trading book are subject to a counterparty risk capital charge as described below. Further, all institutions, including those using the advanced IRB approach, must follow the methodology in the CRM section, outlined below, for repo-style transactions booked in either the banking book or trading book that are subject to master netting agreements if they wish to recognize the effects of netting for capital purposes.

Standardised and Foundation IRB Approaches

3. Institutions under the standardised approach may use either the simple approach or the comprehensive approach for determining the appropriate risk weight for a transaction secured by eligible financial collateral. Under the simple approach, the risk weight of the collateral substitutes for that of the counterparty. Apart from a few types of very low risk transactions, the risk weight floor is 20%. Under the foundation IRB approach, institutions may only use the comprehensive approach.

4. Under the comprehensive approach, eligible financial collateral reduces the amount of the exposure to the counterparty. The amount of the collateral is decreased and, where appropriate, the amount of the exposure is increased through the use of haircuts, to account for potential changes in the market prices of securities and foreign exchange rates over the holding period. This results in an adjusted exposure amount, E*. Institutions may use either set supervisory haircuts stipulated by the rules or, subject to qualifying criteria, rely on their "own" estimates of haircuts. Where the supervisory holding period for calculating the haircut amounts differs from the holding period set down in the rules for that type of collateralized transaction, the haircuts must be scaled up or down as appropriate. Once E* is calculated, an institutions using the standardized

approach assigns that amount a risk weight appropriate to the counterparty. For transactions secured by financial collateral other than repos subject to a master netting agreement, foundation IRB institutions are to use E* to adjust the LGD on the exposure.

Special Considerations for Repo-Style Transactions

5. Repo-style transactions booked in the trading book, are, as with OTC derivatives held in the trading book, subject to a counterparty credit risk charge. In calculating this charge, an institution employing the standardized approach must use the comprehensive approach to collateral; the simple approach is not available.

6. The capital treatment for repo-style transactions that are not subject to master netting agreements is the same as that for other collateralised transactions. Where repo-style transactions are subject to a master netting agreement - whether they are held in the banking book or in the trading book- an institution may choose not to recognize the netting effects in calculating capital. In that case, each transaction is subject to a capital charge as if there were no master netting agreement.

7. Where an institution wishes to recognize the effects of master netting agreements on repo-style transactions for capital purposes, it must apply the treatment set out in the CRM section in that regard on a counterparty-by-counterparty basis. This treatment applies to all repo-style transactions subject to master netting agreements, regardless of whether the standardized, foundation IRB, or advanced IRB approach is used, and regardless of whether the transactions are held in the banking or trading book. Under this treatment, the institution calculates E* as the sum of the net current exposure on the contract plus an add-on for potential changes in security prices and foreign exchange rates. The add-on may be determined through the supervisory haircuts or, for those institutions that meet the qualifying criteria, own estimate haircuts or an internal VaR model. The carve-out treatment for haircuts on repo-style transactions may not be used where an internal VaR model is applied.

8. The calculated E* is in effect an unsecured loan equivalent amount that would be used for the exposure amount under the standardized approach and the exposure at default (EAD) value under both the foundation and advanced IRB approaches. E* is used for EAD under the IRB approaches, thus would be treated in the same manner as the credit equivalent amount (calculated as the sum of replacement cost plus an add-on for potential future exposure) for OTC derivatives subject to master netting agreements.

Annex 2.18

Supervisory Framework for the Use of "Backtesting" in Conjunction with the Internal Models Approach to Market Risk Capital Requirements

I. Introduction

1. This Annex presents the framework that has been developed for incorporating backtesting into the internal models approach to market risk capital requirements. It represents an elaboration of paragraph 297 (j) of section D in Part 2 of this paper.

2. Many institutions that have adopted an internal model-based approach to market risk measurement routinely compare daily profits and losses with model-generated risk measures to gauge the quality and accuracy of their risk measurement systems. This process, known as "backtesting", has been found useful by many institutions as they have developed and introduced their risk measurement models.

3. As a technique for evaluating the quality of a firm's risk measurement model, backtesting continues to evolve. New approaches to backtesting are still being developed and discussed within the broader risk management community. At present, different institutions perform different types of backtesting comparisons, and the standards of interpretation also differ somewhat across institutions. Active efforts to improve and refine the methods currently in use are underway, with the goal of distinguishing more sharply between accurate and inaccurate risk models.

4. The essence of all backtesting efforts is the comparison of actual trading results with model-generated risk measures. If this comparison is close enough, the backtest raises no issues regarding the quality of the risk measurement model. In some cases, however, the comparison uncovers sufficient differences that problems almost certainly must exist, either with the model or with the assumptions of the backtest. In between these two cases is a grey area where the test results are, on their own, inconclusive.

5. Backtesting is seen as offering the best opportunity for incorporating suitable incentives into the internal models approach in a manner that is consistent and that will cover a variety of circumstances. Supervisors also remain keen to maintain strong incentives for the continual improvement of institutions' internal risk measurement models. In considering how to incorporate backtesting more closely into the internal models approach to market risk capital requirements, supervisors have sought to reflect both the fact that the industry has not yet settled on a single backtesting methodology and concerns over the imperfect nature of the signal generated by backtesting.

6. The Authority accepts the framework outlined in this document as striking an appropriate balance between recognition of the potential limitations of backtesting and the need to put in place appropriate incentives. At the same time, it recognizes that the

techniques for risk measurement and backtesting are still evolving, and remains committed to incorporating important new developments in these areas into the framework.

7. The remainder of this document describes the backtesting framework that is to accompany the internal models capital requirement. The aim of this framework is the promotion of more rigorous approaches to backtesting and to the supervisory interpretation of backtesting results. The next section deals with the nature of the backtests themselves, while the section that follows concerns the supervisory interpretation of the results and sets out the standards that have been agreed in this regard.

II. Description of the backtesting framework

8. The backtesting framework is based on that adopted by many of the institutions that use internal market risk measurement models. These backtesting programs typically consist of a periodic comparison of the institution's daily value-at-risk measures with the subsequent daily profit or loss ("trading outcome"). The value-at-risk measures are intended to be larger than all but a certain fraction of the trading outcomes, where that fraction is determined by the confidence level of the value-at-risk measure. Comparing the risk measures with the trading outcomes simply means that the institution counts the number of times that the risk measures were larger than the trading outcome. The fraction actually covered can then be compared with the intended level of coverage to gauge the performance of the risk model. In some cases, this last step is relatively informal, although there are a number of statistical tests that may also be applied.

9. The supervisory framework for backtesting in this annex involves all of the steps identified in the previous paragraph, and attempts to set out as consistent an interpretation of each step as is feasible without imposing unnecessary burdens. Under the value-at-risk framework, the risk measure is an estimate of the amount that could be lost on a set of positions due to general market movements over a given holding period, measured using a specified confidence level.

10. The backtests to be applied compare whether the observed percentage of outcomes covered by the risk measure is consistent with a *99% level of confidence*. That is, they attempt to determine if an institution's 99th percentile risk measures truly cover 99% of the firm's trading outcomes. While it can be argued that the extreme-value nature of the 99th percentile makes it more difficult to estimate reliably than other, lower percentiles, it has been determined that the test should be aligned with the confidence level specified in the amendment to the Basel Capital Accord.

11. An additional consideration in specifying the appropriate risk measures and trading outcomes for backtesting arises because the value-at-risk approach to risk measurement is generally based on the sensitivity of a static portfolio to instantaneous price shocks. That is, end-of-day trading positions are input into the risk measurement model, which assesses the possible change in the value of this static portfolio due to price and rate movements over the assumed holding period.

12. While this is straightforward in theory, in practice it complicates the issue of backtesting. For instance, it is often argued that value-at-risk measures cannot be compared against actual trading outcomes, since the actual outcomes will inevitably be "contaminated" by changes in portfolio composition during the holding period. According to this view, the inclusion of fee income together with trading gains and losses resulting from changes in the composition of the portfolio should not be included in the definition of the trading outcome because they do not relate to the risk inherent in the static portfolio that was assumed in constructing the value-at-risk measure.

13. This argument is persuasive with regard to the use of value-at-risk measures based on price shocks calibrated to longer holding periods. That is, comparing the ten-day, 99th percentile risk measures from the internal models capital requirement with actual ten-day trading outcomes would probably not be a meaningful exercise. In particular, in any given ten day period, significant changes in portfolio composition relative to the initial positions are common at major trading institutions. For this reason, *the backtesting framework described here involves the use of risk measures calibrated to a one-day holding period*. Other than the restrictions mentioned in this paper, the test would be based on how institutions model risk internally.

14. Given the use of one-day risk measures, it is appropriate to employ one-day trading outcomes as the benchmark to use in the backtesting program. The same concerns about "contamination" of the trading outcomes discussed above continue to be relevant, however, even for one-day trading outcomes. That is, there is a concern that the overall one-day trading outcome is not a suitable point of comparison, because it reflects the effects of intraday trading, possibly including fee income that is booked in connection with the sale of new products.

15. On the one hand, intra-day trading will tend to increase the volatility of trading outcomes, and may result in cases where the overall trading outcome exceeds the risk measure. This event clearly does not imply a problem with the methods used to calculate the risk measure; rather, it is simply outside the scope of what the value-at-risk method is intended to capture. On the other hand, including fee income may similarly distort the backtest, but in the other direction, since fee income often has annuity-like characteristics.

16. Since this fee income is not typically included in the calculation of the risk measure, problems with the risk measurement model could be masked by including fee income in the definition of the trading outcome used for backtesting purposes.

17. Some have argued that the actual trading outcomes experienced by the institution are the most important and relevant figures for risk management purposes, and that the risk measures should be benchmarked against this reality, even if the assumptions behind their calculations are limited in this regard. Others have also argued that the issue of fee income can be addressed sufficiently, albeit crudely, by simply removing the mean of the trading outcomes from their time series before performing the backtests. A more

sophisticated approach would involve a detailed attribution of income by source, including fees, spreads, market movements, and intra-day trading results.

18. To the extent that the backtesting program is viewed purely as a statistical test of the integrity of the calculation of the value-at-risk measure, it is clearly most appropriate to employ a definition of daily trading outcome that allows for an "uncontaminated" test. To meet this standard, institutions should develop the capability to perform backtests based on the hypothetical changes in portfolio value that would occur were end-of-day positions to remain unchanged.

19. Backtesting using actual daily profits and losses is also a useful exercise since it can uncover cases where the risk measures are not accurately capturing trading volatility in spite of being calculated with integrity.

20. For these reasons, institutions are urged to develop the capability to perform backtests using both hypothetical and actual trading outcomes. Although national supervisors may differ in the emphasis that they wish to place on these different approaches to backtesting, it is clear that each approach has value. In combination, the two approaches are likely to provide a strong understanding of the relation between calculated risk measures and trading outcomes.

21. The next step in specifying the backtesting program concerns the nature of the backtest itself, and the frequency with which it is to be performed. The framework that has been adopted, which is also the most straightforward procedure for comparing the risk measures with the trading outcomes, is simply to calculate the number of times that the trading outcomes are not covered by the risk measures ("exceptions"). For example, over 200 trading days, a 99% daily risk measure should cover, on average, 198 of the 200 trading outcomes, leaving two exceptions.

22. With regard to the frequency of the backtest, the desire to base the backtest on as many observations as possible must be balanced against the desire to perform the test on a regular basis. The backtesting framework to be applied entails a formal testing and accounting of exceptions on a quarterly basis using the most recent twelve months of data.

23. Institutions intending to move to apply internal models for the calculation of capital requirements must have effective backtesting programs in place and must be able to provide the Authority with some indications of exceptions accounting as part of the initial approval process.

24. Using the most recent twelve months of data yields approximately 250 daily observations for the purposes of backtesting. On an ongoing basis, the Authority reviews the number of exceptions (out of 250) generated by an institution's model as the basis for a supervisory response. In many cases, there will be no response. In other cases, the Authority will initiate a dialogue with the institution to determine if there is a problem

with a model. In the most serious cases, the Authority may impose an increase in an institution's capital requirement or disallow use of the model.

25. The appeal of using the number of exceptions as the primary reference point in the backtesting process is the simplicity and straightforwardness of this approach. From a statistical point of view, using the number of exceptions as the basis for appraising an institution's model requires relatively few strong assumptions. In particular, the primary assumption is that each day's test (exception/no exception) is independent of the outcome of any of the others.

26. It is recognized that tests of this type are limited in their power to distinguish an accurate model from an inaccurate model. To a statistician, this means that it is not possible to calibrate the test so that it correctly signals all the problematic models without giving false signals of trouble at many others. This limitation has been a prominent consideration in the design of the framework presented here, and is also prominent among the considerations used by the Authority in interpreting the results of an institution's backtesting program. However, this limitation is not viewed as a decisive objection to the use of backtesting. Rather, conditioning supervisory standards on a clear framework, though limited and imperfect, is seen as preferable to a purely judgmental standard or one with no incentive features whatsoever.

III. Supervisory framework for the interpretation of backtesting results

A. Description of three-zone approach

27. Bearing in mind the statistical limitations of backtesting, the framework for the supervisory interpretation of backtesting results encompasses a range of possible responses, depending on the strength of the signal generated from the backtest. These responses are classified into three zones, distinguished by colours into a hierarchy of responses. The green zone corresponds to backtesting results that do not themselves suggest a problem with the quality or accuracy of a model. The yellow zone encompasses results that do raise questions in this regard, but where such a conclusion is not definitive. The red zone indicates a backtesting result that almost certainly indicates a problem with a risk model.

28. The agreed standards regarding the definitions of these zones in respect of the number of exceptions generated in the backtesting program are set out below. To place these definitions in proper perspective, however, it is useful to examine the probabilities of obtaining various numbers of exceptions under different assumptions about the accuracy of a risk measurement model.

B. Statistical considerations in defining the zones

29. Three zones have been delineated and their boundaries chosen in order to balance two types of statistical error: (1) the possibility that an accurate risk model would be classified as inaccurate on the basis of its backtesting result, and (2) the possibility that an inaccurate model would not be classified that way based on its backtesting result.

30. Table 1 shows the probabilities of obtaining a particular number of exceptions from a sample of 250 independent observations under several assumptions about the actual percentage of outcomes that the model captures (that is, these are binomial probabilities). For example, the left-hand portion of Table 1 reports probabilities associated with an accurate model (that is, a true coverage level of 99%). Under these assumptions, the column labelled "exact" reports that exactly five exceptions can be expected in 6.7% of the samples.

31. The right-hand portion of Table 1 reports probabilities associated with several possible inaccurate models, namely models whose true levels of coverage are 98%, 97%, 96%, and 95%, respectively. Thus, the column labelled "exact" under an assumed coverage level of 97% shows that five exceptions would then be expected in 10.9% of the samples.

32. Table 1 also shows several important error probabilities. For the assumption that the model covers 99% of outcomes (the desired level of coverage), the table shows the probability that selecting a given number of exceptions as a threshold for rejecting the accuracy of the model will result in an erroneous rejection of an accurate model ("type 1" error). For example, if the threshold is set as low as one exception, then accurate models will be rejected fully 91.9% of the time, because they will escape rejection only in the 8.1% of cases where they generate zero exceptions. As the threshold number of exceptions is increased, the probability of making this type of error declines.

33. Under the assumptions that the model's true level of coverage is not 99%, Table 1 shows the probability that selecting a given number of exceptions as a threshold for rejecting the accuracy of the model will result in an erroneous acceptance of a model with the assumed (inaccurate) level of coverage ("type 2" error). For example, if the model's actual level of coverage is 97%, and the threshold for rejection is set at seven or more exceptions, the table indicates that this model would be erroneously accepted 37.5% of the time.

34. In interpreting the information in Table 1, it is also important to understand that although the alternative models appear close to the desired standard in probability terms (97% is close to 99%), the difference between these models in terms of the size of the risk measures generated can be substantial. That is, an institution's risk measure could be substantially less than that of an accurate model and still cover 97% of the trading outcomes. For example, in the case of normally distributed trading outcomes, the 97th percentile corresponds to 1.88 standard deviations, while the 99th percentile corresponds to 2.33 standard deviations, an increase of nearly 25%. Thus, the supervisory desire to

distinguish between models providing 99% coverage, and those providing say, 97% coverage, is a very real one.

C. Definition of the green, yellow, and red zones

35. The results in Table 1 also demonstrate some of the statistical limitations of backtesting. In particular, there is no threshold number of exceptions that yields both a low probability of erroneously rejecting an accurate model and a low probability of erroneously accepting all of the relevant inaccurate models. It is for this reason an approach that contains only a single threshold has been rejected.

36. Given these limitations, outcomes have been classified into three categories. In the first category, the test results are consistent with an accurate model, and the possibility of erroneously accepting an inaccurate model is low (green zone). At the other extreme, the test results are extremely unlikely to have resulted from an accurate model, and the probability of erroneously rejecting an accurate model on this basis is remote (red zone). In between these two cases, however, is a zone where the backtesting results could be consistent with either accurate or inaccurate models, and supervisors need to obtain additional information about the model before taking action (yellow zone).

37. Table 2 sets out the agreed boundaries for these zones and the presumptive supervisory response for each backtesting outcome, based on a sample of 250 observations. For other sample sizes, the boundaries should be deduced by calculating the binomial probabilities associated with true coverage of 99%, as in Table 1. The yellow zone begins at the point such that the probability of obtaining that number or fewer exceptions equals or exceeds 95%. Table 2 reports these cumulative probabilities for each number of exceptions. For 250 observations, it can be seen that five or fewer exceptions will be obtained 95.88% of the time when the true level of coverage is 99%. Thus, the yellow zone begins at five exceptions.

38. Similarly, the beginning of the red zone is defined as the point such that the probability of obtaining that number or fewer exceptions equals or exceeds 99.99%. Table 2 shows that for a sample of 250 observations and a true coverage level of 99%, this occurs with ten exceptions.

D. The green zone

39. The green zone needs little explanation. Since a model that truly provides 99% coverage would be quite likely to produce as many as four exceptions in a sample of 250 outcomes, there is little reason for concern raised by backtesting results that fall in this range. This is reinforced by the results in Table 1, which indicate that accepting outcomes in this range leads to only a small chance of erroneously accepting an inaccurate model.

E. The yellow zone

40. The range from five to nine exceptions constitutes the yellow zone. Outcomes in this range are plausible for both accurate and inaccurate models, although Table 1 suggests that they are generally more likely for inaccurate models than for accurate models. Moreover, the results in Table 1 indicate that the presumption that the model is inaccurate should grow as the number of exceptions increases in the range from five to nine.

41. Within the yellow zone, the number of exceptions can be seen as providing a general guide regarding the size of potential supervisory increases in a firm's capital requirement. Table 2 sets out the agreed guidelines for increases in the multiplication factor applicable to the internal models capital requirement, resulting from backtesting results in the yellow zone.

42. These guidelines help in maintaining the appropriate structure of incentives applicable to the internal models approach. In particular, the potential supervisory penalty increases with the number of exceptions. The results in Table 1 generally support the notion that nine exceptions is a more troubling result than five exceptions, and these steps are meant to reflect that.

43. These particular values reflect the general idea that the increase in the multiplication factor should be sufficient to return the model to a 99th percentile standard. For example, five exceptions in a sample of 250 implies only 98% coverage. Thus, the increase in the multiplication factor should be sufficient to transform a model with 98% coverage into one with 99% coverage. Needless to say, precise calculations of this sort require additional statistical assumptions that are not likely to hold in all cases. For example, if the distribution of trading outcomes is assumed to be normal, then the ratio of the 99th percentile to the 98^{th} percentile is approximately 1.14, and the increase needed in the multiplication factor is therefore approximately 0.40 for a scaling factor of 3. If the actual distribution is not normal, but instead has "fat tails", then larger increases may be required to reach the 99th percentile standard. The concern about fat tails was also an important factor in the choice of the specific increments set out in Table 2.

44. It is important to stress, however, that these increases are not meant to be purely automatic. The results in Table 1 indicate that results in the yellow zone do not always imply an inaccurate model. Nevertheless, to keep the incentives aligned properly, backtesting results in the yellow zone should generally be presumed to imply an increase in the multiplication factor unless the institution can demonstrate that such an increase is not warranted.

45. In other words, the burden of proof in these situations is placed primarily upon the institution to demonstrate that its model is fundamentally sound. In such a situation, there are many different types of additional information that might be relevant to an assessment of the model.

46. For example, it would then be particularly valuable to see the results of backtests covering disaggregated subsets of the institution's overall trading activities. Many firms

that engage in regular backtesting programs break up their overall trading portfolio into trading units organized around risk factors or product categories. Disaggregating in this fashion could allow the tracking of a problem that surfaced at the aggregate level back to its source at the level of a specific trading unit or risk model.

47. Institutions should also document all of the exceptions generated from their ongoing backtesting program, including an explanation for the exception. This documentation is important in determining an appropriate supervisory response to a backtesting result in the yellow zone. Institutions may also implement backtesting for confidence intervals other than the 99th percentile, or may perform other statistical tests not considered here. Naturally, this information could also prove very helpful in assessing their model.

48. In practice, there are several possible explanations for a backtesting exception, some of which go to the basic integrity of the model, some of which suggest an underspecified or low-quality model, and some of which suggest either bad luck or poor intra-day trading results. Classifying the exceptions generated by a model into these categories can be a very useful exercise.

Basic integrity of the model

(a) The institution's systems simply are not capturing the risk of the positions themselves (e.g. the positions of an overseas office are being reported incorrectly).
(b) Model volatilities and/or correlations were calculated incorrectly (e.g. the computer is dividing by 250 when it should be dividing by 225).

Model's accuracy could be improved

(c) The risk measurement model is not assessing the risk of some instruments with sufficient precision (e.g. too few maturity buckets or an omitted spread).

Bad luck or markets moved in fashion unanticipated by the model

(d) Random chance (a very low probability event).
(e) Markets moved by more than the model predicted was likely (i.e. volatility was significantly higher than expected).
(f) Markets did not move together as expected (i.e. correlations were significantly different than what was assumed by the model).

Intra-day trading

(g) There was a large (and money-losing) change in the firm's positions or some other income event between the end of the first day (when the risk estimate was calculated) and the end of the second day (when trading results were tabulated).

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49. In general, problems relating to the basic integrity of the risk measurement model are potentially the most serious. If there are exceptions attributed to this category for a particular trading unit, the plus should apply. In addition, the model may be in need of substantial review and/or adjustment, and the supervisor can be expected to take appropriate action to ensure that this occurs.

50. The second category of problem (lack of model precision) is one that can be expected to occur at least part of the time with most risk measurement models. No model can hope to achieve infinite precision, and thus all models involve some amount of approximation. If, however, a particular model appears more prone to this type of problem than others, the supervisor can be expected to impose the plus factor and also consider what other incentives are needed to spur improvements.

51. The third category of problems (markets moved in a fashion unanticipated by the model) should also be expected to occur at least some of the time with value-at-risk models. In particular, even an accurate model is not expected to cover 100% of trading outcomes. Some exceptions are surely the random 1% that the model can be expected not to cover. In other cases, the behaviour of the markets may shift so that previous estimates of volatility and correlation are less appropriate. No value-at-risk model will be immune from this type of problem; it is inherent in the reliance on past market behaviour as a means of gauging the risk of future market movements.

52. Finally, depending on the definition of trading outcomes employed for the purpose of backtesting, exceptions could also be generated by intra-day trading results or an unusual event in trading income other than from positioning. Although exceptions for these reasons would not necessarily suggest a problem with the value-at-risk model, they could still be cause for supervisory concern and the imposition of the plus should be considered.

53. The extent to which a trading outcome exceeds the risk measure is another relevant piece of information. All else equal, exceptions generated by trading outcomes far in excess of the risk measure are a matter of greater concern than are outcomes only slightly larger than the risk measure.

54. In deciding whether or not to apply increases in an institution's capital requirement, the Authority weighs these factors as well as others, including an appraisal of the institution's compliance with applicable qualitative standards of risk management. Based on the assessment of such additional information as appears appropriate, the Authority decides on the appropriate course of action.

55. In general, the imposition of a higher capital requirement for outcomes in the yellow zone is viewed as an appropriate response when the Authority concludes that the reason for being in the yellow zone is a correctable problem in a model. This can be contrasted with the case of an unexpected bout of high market volatility, which nearly all models may fail to predict. While these episodes may be stressful, they do not necessarily indicate that a particular risk model is in need of redesign. Finally, in the case of severe problems with the basic integrity of the model, the Authority considers whether to disallow the use of the model for capital purposes altogether.

F. The red zone

56. Finally, in contrast to the yellow zone where the Authority will exercise appropriate judgment in interpreting the backtesting results, outcomes in the red zone (ten or more exceptions) generally lead to an automatic presumption that a problem exists with an institution's model. This is because it is extremely unlikely that an accurate model would independently generate ten or more exceptions from a sample of 250 trading outcomes.

57. In general, therefore, if a model falls into the red zone, the Authority automatically increases the multiplication factor applicable to a firm's model by one (from three to four). At the same time, the Authority seeks to establish the precise reasons why the model has produced such a large number of misses, and requires the institution to begin work on improving its model immediately.

58. Although ten exceptions is a very high number for 250 observations, there will on very rare occasions be a valid reason why an accurate model will produce so many exceptions. In particular, when financial markets are subjected to a major regime shift, many volatilities and correlations can be expected to shift as well, perhaps substantially. Unless an institution is prepared to update its volatility and correlation estimates instantaneously, such a regime shift could generate a number of exceptions in a short period of time. In essence, however, these exceptions would all be occurring for the same reason, and therefore the appropriate supervisory reaction might not be the same as if there were ten exceptions, but each from a separate incident. One possible supervisory response in this instance may be simply to require the model to take account of the regime shift as quickly as it can while maintaining the integrity of its procedures for updating the model.

59. The Authority views such an exception as highly exceptional and would only be prepared to accept it in the most extraordinary circumstances, taking the view that the normal response to backtesting results falling into the red zone should be an automatic and non-discretionary increase in the capital requirement.

IV. Conclusion

60. The above framework is intended to provide the basis for a consistent approach for incorporating backtesting into the internal models approach to market risk capital requirements. The goals of this effort have been to build appropriate and necessary incentives into a framework that relies heavily on the efforts of institutions themselves to calculate the risks they face, to do so in a way that respects the inherent limitations of the available tools, and to keep the burdens and costs of the imposed procedures to a minimum.

Table 1

Model is accurate			Model is inaccurate: Possible alternative levels of coverage							
Exceptions (our of 250)	Coverage = 99% exact	type 1	Exceptions (our of 250)	Coverage = 98% exact	type 2	Coverage = 97% exact	type 2	Coverage = 96% exact	type 2	Coverage = 95% exact	type 2
0	8.1 %	100.0 %	0	0.6 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %
1	20.5 %	91.9 %	1	3.3 %	0.6 %	0.4 %	0.0 %	0.0 %	0.0 %	0.0 %	0.0 %
2	25.7 %	71.4 %	2	8.3 %	3.9 %	1.5 %	0.4 %	0.2 %	0.0 %	0.0 %	0.0 %
3	21.5 %	45.7 %	3	14.0 %	12.2 %	3.8 %	1.9 %	0.7 %	0.2 %	0.1 %	0.0 %
4	13.4 %	24.2 %	4	17.7 %	26.2 %	7.2 %	5.7 %	1.8 %	0.9 %	0.3 %	0.1 %
5	6.7 %	10.8 %	5	17.7 %	43.9 %	10.9 %	12.8 %	3.6 %	2.7 %	0.9 %	0.5 %
6	2.7 %	4.1 %	6	14.8 %	61.6 %	13.8 %	23.7 %	6.2 %	6.3 %	1.8 %	1.3 %
7	1.0 %	1.4 %	7	10.5 %	76.4 %	14.9 %	37.5 %	9.0 %	12.5 %	3.4 %	3.1 %
8	0.3 %	0.4 %	8	6.5 %	86.9 %	14.0 %	52.4 %	11.3 %	21.5 %	5.4 %	6.5 %
9	0.1 %	0.1 %	9	3.6 %	93.4 %	11.6 %	66.3 %	12.7 %	32.8 %	7.6 %	11.9 %
10	0.0 %	0.0 %	10	1.8 %	97.0 %	8.6 %	77.9 %	12.8 %	45.5 %	9.6 %	19.5 %
11	0.0 %	0.0 %	11	0.8 %	98.7 %	5.8 %	86.6 %	11.6 %	58.3 %	11.1 %	29.1 %
12	0.0 %	0.0 %	12	0.3 %	99.5 %	3.6 %	92.4 %	9.6 %	69.9 %	11.6 %	40.2 %
13	0.0 %	0.0 %	13	0.1 %	99.8 %	2.0 %	96.0 %	7.3 %	79.5 %	11.2 %	51.8 %
14	0.0 %	0.0 %	14	0.0 %	99.9 %	1.1 %	98.0 %	5.2 %	86.9 %	10.0 %	62.9 %
15	0.0 %	0.0 %	15	0.0 %	100.0 %	0.5 %	99.1 %	3.4 %	92.1 %	8.2 %	72.9 %

Notes: The table reports both exact probabilities of obtaining a certain number of exceptions from a sample of 250 independent observations under several assumptions about the true level of coverage, as well as type 1 or type 2 error probabilities derived from these exact probabilities.

The left-hand portion of the table pertains to the case where the model is accurate and its true level of coverage is 99%. Thus, the probability of any given observation being an exception is 1% (100% - 99% = 1%). The column labelled "exact" reports the probability of obtaining exactly the number of exceptions shown under this assumption in a sample of 250 independent observations. The column labelled "type 1" reports the probability that using a given number of exceptions as the cut-off for rejecting a model will imply erroneous rejection of an accurate model using a sample of 250 independent observations. For example, if the cut-off level is set at five or more exceptions, the type 1 column reports the probability of falsely rejecting an accurate model with 250 independent observations is 10.8%.

The right-hand portion of the table pertains to models that are inaccurate. In particular, the table concentrates of four specific inaccurate models, namely models whose true levels of coverage are 98%, 97%, 96% and 95% respectively. For each inaccurate model, the "exact" column reports the probability of obtaining exactly the number of exceptions shown under this assumption in a sample of 250 independent observations. The columns labelled "type 2" report the probability that using a given number of exceptions as the cut-off for rejecting a model will imply erroneous acceptance of an inaccurate model with the assumed level of coverage using a sample of 250 independent observations. For example, if the cut-off level is set at five or more exceptions, the type 2 column for an assumed coverage level of 97% reports the probability of falsely accepting a model with only 97% coverage with 250 independent observations is 12.8%.

Table 2

Zone	Number of exceptions	Increase in scaling factor	Cumulative probability
Green Zone	0	0.00	8.11%
	1	0.00	28.58%
	2	0.00	54.32%
	3	0.00	75.81%
	4	0.00	89.22%
Yellow Zone	5	0.40	95.88%
	6	0.50	98.63%
	7	0.65	99.60%
	8	0.75	99.89%
	9	0.85	99.97%
Red Zone	10 or more	1.00	99.99%

Notes: The table defines the green, yellow and red zones that supervisors will use to assess backtesting results in conjunction with the internal models approach to market risk capital requirements. The boundaries shown in the table are based on a sample of 250 observations. For other sample sizes, the yellow zone begins at the point where the cumulative probability equals or exceeds 95%, and the red zone begins at the point where the cumulative probability equals or exceeds 99.99%.

The cumulative probability is simply the probability of obtaining a given number or fewer exceptions in a sample of 250 observations when the true coverage level is 99%. For example, the cumulative probability shown for four exceptions is the probability of obtaining between zero and four exceptions.

Note that these cumulative probabilities and the type 1 error probabilities reported in Table 1 do not sum to one because the cumulative probability for a given number of exceptions includes the possibility of obtaining exactly that number of exceptions, as does the type 1 error probability. Thus, the sum of these two probabilities exceeds one by the amount of the probability of obtaining exactly that number of exceptions.

Annex 3.1

The Capital Assessment and Risk Profile (CARP) document: additional guidance and a suggested template

Additional guidance

i *structure, content and purpose*

The need for the CARP procedures to be owned by the Group board is paramount. As part of that ownership the Authority would expect the Board to receive, discuss and ultimately approve, at least annually, a summary document setting out the key features of these procedures. Much of that document will be based on detailed information with which the Board should already be familiar and have been involved with as part of its everyday Governance arrangements (such as the risk appetite and related control framework and the forward looking strategic business and capital plans and projections). All of these important elements of the overall governance will be documented and in many cases will already have been shared with the Authority as part of ongoing risk-based supervision. It would make little sense for that detail to be needlessly repeated in the CARP document.

Its main purpose should be to bring together in one place for the Board a high level insight into all of these different elements and how they inter-react. It should not be a document produced primarily for the benefit of the Authority. However, adopting the format suggested in the attached template would cover most of the matters which typically would be the subject of high level discussions between the Board, other senior managers and the Authority. Using it should, therefore, assist those discussions but it is not a requirement to do so. If the Board judges a different format – or more detail within the format suggested - would better suit its own purposes and be more closely aligned to the nature of its group structure and business profile, the Authority will not in principle object.

ii *what needs to be sent to the Authority*

Much of the detailed supporting material referred to above will already have been seen by the Authority as part of its ongoing supervision. As a general rule the Authority would be content for firms NOT to attach copies of documents already submitted when the Authority asks to be sent a copy of the CARP document.

The better the quality of the analysis set out in the CARP document, and the closer management's conclusions are relative to those of its peer group/ the Authority's own assessment, the less likely it will be that the Authority will need to test or challenge these detailed documents as a matter of course. It will, of course, wish to do so periodically, as now.

It is likely that Boards will sign-off their annual CARP document - especially the first one - some time before the Authority requests to receive a copy. This timing gap means that, when it is requested, it should be accompanied by a copy of a detailed minute of the Board discussion covered by a letter from the CEO highlighting any material changes that resulted from that discussion, together with any other material changes in the Group's circumstances that have occurred since.

Suggested template

To the Board of *XYZ Banking Group*: CARP document

Purpose

This document summarizes the Capital Assessment and Risk Profile (CARP) procedures adopted within the XYZBG to enable management to ensure that they can properly relate to the Board's risk profile the amount of capital and risk management techniques deployed. This document has been prepared in accordance with the Pillar 2 requirements introduced by the Bermuda Monetary Authority from 1/1/09.

A copy will be provided to the BMA upon request once it has been discussed and approved by the Board.

Contents

1. Scope

2. Main conclusions of the capital assessment (Table).

3. Background and assumptions (Risk appetite and strategic objectives)

4. Key features:
   - Insight into the material risks identified
   - Stress testing and implications for capital planning
   - Management actions

5. List of technical, policy and other documents underpinning the CARP

1. Scope

This section might usefully:
- set out the time horizon addressed.
- summarize how many entities are covered; and explain if any have been excluded
- identify which are the most material – in terms of capital /contribution to current earnings now and those projected over the time horizon covered. Identify which other subsidiaries (if any) are subject to capital adequacy supervision outside

Bermuda, their main generic line of business e.g. banking/asset management/insurance and their relevant supervisor.

- The information in this section should be supported as necessary by organograms, structure charts, financial information and projections, etc.

2. Capital Assessment and Risk Profile (CARP): Summary

All figures in $000

	Consolidated group	**Solo bank**	**Observations**
RISK Type			
(i) Pillar 1 calculation			
Credit			
operational			
market			
Sub-Total (a)			
(ii) Pillar 2 considerations			
Lack of diversity			
Concentrations			
Residual risk			
Liquidity risk			
IRR in the banking book			
Op risk adjustment			
Strategic risk			
Reputational risk			
Pension fund deficit			
Other (please specify)			
Sub-total (b)			
Stress test results (c)			
TOTAL Pillar 1+Pillar 2 requirement (a)+(b)+(c)			

Footnote:	Total	Of which Tier 1
Current capital available		
Current surplus (over Pillar1+Pillar2 figure)		

3. Background and assumptions

This section:

- might start with a brief description of the Board's risk appetite against which the capital assessment has been made. This might describe, in relation to earnings, what the worst case decline would be that the Board would tolerate before the business strategy would be reviewed/other remedial action taken.

- would make clear if (and why) there are any differences between what is being presented as the firm's view of the amount of capital required to meet minimum regulatory needs and the amount it believes necessary to meet its business objectives (e.g. is a capital "buffer" required to obtain a particular desired credit rating or for strategic or other purposes). Any such differences should be quantified, including a breakdown between tiers 1 and 2.

- is likely to include a short synopsis of the key elements from the latest strategic business (corporate) plan and the main assumptions underlying the related financial and market or product penetration projections and objectives.

4. Key features of the CARP procedures

This is likely to be the most lengthy and important section and would:

- contain sufficient detail - supported as necessary by reference to more detailed technical papers that should be available - to provide a clear insight into how each the various material risks identified in section 2 have been assessed (e.g. against earnings, price of assets, cost /access to funding, etc)

- explain the nature of any stress testing undertaken to help determine what an appropriate mitigant to each risk would be, and why the basis on which these were chosen and judged appropriately prudent.

- Provide an insight into the capital planning implications of the above analysis and how these affect:

- the structure of the capital base (between Tiers 1 and 2)
- the distribution of capital around the group – including the transferability of capital in times of stress and any barriers that exist (for instance on upstreaming dividend payments; or where capital amounts are "locked-in by other regulators' minimum requirements; or would be reduced by tax).

The section on capital planning would also be an appropriate place to summarize the results of any scenario testing that is undertaken (over and above the specific stress testing covered above) to gauge the impact on earnings (and ultimately capital) of the sort of low probability / high impact scenario mentioned in paragraph 28 iii of Part 3 of the main paper. This would probably be linked back to the risk appetite described earlier in paragraph 15 of Part 3.

Management should set out here briefly what action the firm/group would realistically be able to take to mitigate the potential impact of such events and over what time horizon. (This section is one that would need to be supported by detailed documentation available on request. The analysis would include financial projections forward for, say, three years based on business plans and contain detailed solvency calculations). The Authority will focus on how a firm believes it would be able to manage its business and capital in such circumstances and still meet minimum regulatory thresholds.

5. Detailed supporting documentation

As noted elsewhere the high level overview provided by a CARP document should be supported as appropriate by a range of specific technical information and a variety of documentation. This section would helpfully list them. Areas likely to be covered would include:

- strategic and capital planning;
- risk measurement methodologies and policies;
- governance structures (risk committees, ALCOs etc.) plus relevant board papers/minutes and internal or external audit reviews; and
- any other analysis and assessments (e.g. scenario testing) carried out to validate the Board's overall conclusion on how much capital it requires to match its risk appetite.

Annex 3.2

The SAP "toolkit"

The Basel Committee has identified three key principles to underpin the supervisory assessment process. The Statement of Principles issued by the Authority pursuant to the Act reflects those principles as well as others previously endorsed by the Committee in the course of its extensive supervisory guidance. These complement those outlined in the previous extensive supervisory guidance it has developed, all of which the Authority has adopted in its Statement of Principles.

The Authority's risk-based approach to implementing those Principles in its day-to-day supervision reflects its commitment to be proportionate and includes using a combination of "supervisory tools" including:

- drawing extensively on well-structured CARP documents to assist its ongoing reviews of the procedures (including governance) a bank uses to assess its capital adequacy and risk positions.

- assessing the quality of the bank's risk management and controls, by:

    - undertaking focused on-site examinations or inspections;
    - conducting off-site reviews of management information, policy documents, regulatory returns, financial accounts;
    - peer group comparisons;
    - increasingly looking to receive and challenge the results of firms' detailed stress and scenario testing against its own modeled scenarios (e.g. IRR in banking book);
    - holding discussions with senior bank management, typically including those responsible for the key control functions as well as the CEO , FD , business heads and non-executive members of the Board;
    - meeting with the external auditors to discuss matters of common interest.

An important principle in delivering a proportionate approach to Pillar 2 is recognition by the Authority of the need to avoid unnecessary duplication in fulfilling its supervisory responsibilities. This can be particularly relevant where it is the "host" supervisor for local subsidiaries that are part of international groups subject to broadly equivalent consolidated supervision elsewhere. The Authority is also a "home" lead supervisor for some groups. In both roles the Authority's approach is to liaise and share relevant information with other supervisors and seek to co-ordinate supervisory actions as far as possible.

The Authority considers imposing a range of remedial actions if, as a result of its SAP, it becomes concerned that a bank or group is not meeting the minimum standards embodied

in the Statement of Principles. These actions, and the reasons for them, will be explained to management prior to being implemented and may include one or more of the following:

- intensifying the monitoring of the bank and/or additional reporting
- requiring changes in / a strengthening of management
- requiring enhancement to existing /introduction of new control procedures
- restricting the payment of dividends
- forcing changes in strategy e.g. by issuing directions prohibiting certain actions or requiring certain actions or restricting the scope of the bank's business
- requiring the bank to prepare and implement a satisfactory capital adequacy restoration plan
- requiring the bank to raise additional capital immediately

Often the appropriate remedy to perceived weaknesses cannot be achieved simply by an increase in capital. Moreover, some of the required remedies (such as improving systems and controls) may take a period of time to implement. In such circumstances increased capital may be used as an interim measure to provide additional depositor protection while permanent measures to improve the bank's position are being put in place. Only when these measures have been put in place and been seen by supervisors to be effective will the Authority consider if an interim increase in capital requirements can be removed.

Annex 3.3

Transitional Arrangements

The Authority's first review of banks' own capital assessments contained in their CARP documents will occur on a phased basis some time after the 1/1/09 implementation date. Accordingly, a transitional measure will be required as we move from Basel I to Basel II until such time as the first round review process is completed. The Authority will use the 31/12/08 capital figure (calculated on the Basel I methodology) as the basis to determine a transitional "Pillar 2 equivalent" capital requirement until the CARP has been reviewed.

Example of the transitional calculation

The example set out below *(for a Hypothetical Banking Group)* explains how the Authority will transition firms from the current to the new approach.

Step 1 As at 31/12/08 calculate and compare the required amount of regulatory capital relative to the actual capital base (at the solo and consolidated levels) using the current methodology. This might look as follows:

		$ millions	
		Solo	Consolidated
RWAs		2,390	4,220
Trigger ratio		8%	10%
BMA Capital Requirement	(a)	191	422
Basel 8% minimum	(b)	191	337
Actual capital held	(c)	245	500
Actual surplus held above:			
(a) BMA requirement =	(d)	54	78
(b) Basel minimum 8% =	(e)	54	163

<u>Step 2</u> Derive, from the Step1 comparisons, an implicit capital proxy for Pillar 2 risks measured (as a ratio) by the relationship between the Basel 8% minimum capital level and either:

(i) the Actual capital held	(c)/(b)
	or
(ii) the BMA current minima	(a)/(b)

These ratios provide a tentative insight/ measure of how (i) management and (ii) the Authority currently view the relationship between the Basel minimum 8% quantitative (Pillar1 type) regulatory capital needs and the wider, more qualitative (Pillar 2 type) risks together with business and strategic considerations when determining what level of capital is necessary. This ratio between Pillar 2 and Pillar1 capital levels will become the benchmark – replacing the existing trigger ratio- that the Authority will set post 1/1/09 to determine the minimum absolute amount of regulatory capital necessary.

In practice, unless there are good reasons to do otherwise, the Authority will adopt the ratio set out in (ii) above as a means of setting the transitional capital requirement for each bank.

In determining what the appropriate transitional level of regulatory capital at the solo bank level should be the Authority will not base this on the ratio derived using the BMA's current 8% trigger (which is the same as the Basel minimum). Instead the Authority will apply the current 10% consolidated trigger to the solo entity as its starting point for determining the appropriate level of regulatory capital for each solo bank during the transitional period beginning 1/1/09. This will increase the solo bank figure at (a) under Step 1 from $191mn to $239mn.

<u>Step 3</u> If the capital requirement is recalculated as at 1/01/09 <u>applying the new Pillar 1 methodology</u>; the figures might change as follows:

RWAs (reduced credit risk charge)		1,910	3,375
Convert to capital (using Pillar 1 8% floor) =	(f)	152	270
Operational risk charge (say) =	(g)	20	35
Total Pillar 1 base capital requirement (f)+(g) =	(h)	172	305

For transitional purposes the Pillar 2: Pillar 1 ratio derived from Step 2 (ii) (125% for both solo and consolidated calculations) will be applied to (h) as follows[76]:

Pillar 1 base requirement		172	305
Proxy Pillar 2 : Pillar 1 ratio		125%	125%
New (transitional) capital requirement	(j)	215	381
"Surplus" actual capital held (c)-(j) =	(k)	30	119

The Authority will wish to discuss with management nearer to 1/1/09 the transitional regulatory capital requirements it expects to be appropriate based on the above approach and how those requirements relate to the actual capital held at that time. In practice bank management typically operate at capital levels above – sometimes significantly above - the regulatory minima set by the Authority. As a matter of policy the Authority will not, in practice, expect banks to operate during the transitional period in 2009 with an actual capital buffer that is materially below the level their management currently believe is necessary. This approach is consistent with the "capital floor" principle embodied in the Basel II framework which is designed to phase in over 3 years any reduced regulatory capital requirements banks derive from the new framework. In practice the Authority is unlikely to seek to impose capital floors beyond end -2009, by which time it expects to have completed its initial round of Pillar 2 SAP assessments for all banks.

Step 4 Assuming that during Q2 2009 the BMA completes a Pillar 2 SAP review of the *Hypothetical Banking Group* it will inform the management what additional capital (if any) under Pillar 2 it has determined is required for regulatory purposes (e.g. to reflect lack of diversification etc). This might look as follows (assuming for simplicity that the Pillar 1 figures remain unchanged from Step 3):

Pillar1 base figure =	(h) from Step 3	172	305
BMA Pillar 2 requirement (say) =	(m)	38	90
Total capital requirement (h)+(m) =	(n)	210	395
New Trigger ratio	(n) / (h)	122.1%	129.5%

The new regulatory capital requirement will therefore be set by the Authority as an absolute US dollar figure ((n)); this will be translated into a ratio showing it as a multiple of the Pillar 1 capital calculation. In the above example, by way of illustration, the minimum level of regulatory capital needed at the solo level at any time after the

[76] It is likely that firms will be required to submit two sets of regulatory returns showing their capital calculations as at the end of December under both the existing and new methodologies.

Authority has completed its Pillar 2 assessment would be 1.221 x the Pillar 1 capital calculation. As now the Authority would always expect management to operate with a capital cushion (target) above that minimum figure.