

THE SUPERVISORY TREATMENT
OF
MARKET RISKS

Consultative proposal by the
Basle Committee on Banking Supervision

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THE SUPERVISORY TREATMENT OF MARKET RISKS

INTRODUCTION

1. The Basle Committee on Banking Supervision ("the Committee") is issuing the attached proposals for the supervisory treatment of market risks incurred by banks. Market risk is the risk of losses in on and off-balance-sheet positions arising from movements in market prices, including interest rates, exchange rates and equity values. The basic thrust of the proposals is to require capital requirements for open positions in debt securities, equities and foreign exchange. It is intended that, following a comment period, the proposed new capital requirements would be integrated with the Basle Capital Accord ("the Accord").
2. The primary objective of the Accord, adopted in July 1988, was to establish minimum capital standards designed to protect against credit risk. Credit risk was and remains the major risk facing banking institutions. At the time, however, it was recognised that in due course the capital adequacy framework would have to be broadened to take direct and explicit account of market risk. In the intervening period, changes in technology, in market practices and in the nature of many "banking" activities have made it even more important that the 1988 Accord be broadened to take into account market risk.
3. In these circumstances the Committee has set out to develop a framework for integrating into the 1988 Accord an approach to assessing explicit capital charges for market risk that would satisfy two principal objectives; first, the framework for estimating the amount of such capital charges and the manner in which such capital charges could be satisfied should constitute a minimum prudential standard relative to the potential for losses that might be incurred for a given portfolio of open positions in debt and equity securities in the trading portfolio and in foreign exchange; second, the framework should be one in which the capital charges for each class of instruments (i.e. debt, equities and foreign exchange) would be roughly equivalent in economic terms so as not to create artificial incentives favouring one class of instrument over others.
4. The Committee recognises fully that achieving these dual objectives represents something of a challenge, especially in a setting

in which innovation and change in banking and financial markets continue at a very rapid pace. However, the very fact of this extraordinarily rapid pace of change underscores the Committee's belief that the time has come to solicit the views of market participants on the approaches to this task which the Committee has in mind.

5. Accordingly, with the consent of the Governors of the Group of Ten central banks, the Committee is inviting comments on the proposals described in this paper to apply capital requirements to banks for the market risks arising from position-taking in debt and equity securities in the trading portfolio and in foreign exchange. The framework would also encompass positions in many of the derivative instruments used in each of these three principal lines of activity. Section 1 describes the rationale for the framework and considers what changes might be needed to the 1988 Capital Accord. Sections 2, 3 and 4 propose methodologies for computing capital charges for open positions in debt securities, equities and foreign exchange respectively.

6. The Committee is well aware of the discussions in the European Community which have resulted in the adoption of a Capital Adequacy Directive which covers much of the same ground. The proposals contained herein are in many cases identical to the Capital Adequacy Directive. Article 14 of that Directive provides for the possibility of revision, in the light of market innovation and developments in international regulatory fora, within a period of three years. The Committee believes it is essential that the proposals developed in different fora be as consistent as possible and is therefore keen to develop an international agreement which would apply to all the major market players, both inside and outside the EC. However, because the consultative process will, of necessity, be long and the phased implementation even longer, it is the Committee's judgement that its internal deliberations cannot proceed further without the benefit of market participants' reactions to the overall approach.

7. The primary purpose of the consultative process is to seek market reactions to the specific methodologies proposed in Sections 2-4. The proposals in Sections 2 and 3 for debt and equity securities in the trading portfolio have been designed in such a way that eventually they may be applied to both banks and securities firms. These proposals contain certain features which bank supervisors acting on their own would not necessarily favour but are prepared to adopt in the hope that further

convergence with securities regulators will be achieved at some future date. Thus, while the focus of the consultative process is the banking industry, the overall approach has been designed with a view toward its ultimate application to a wider spectrum of institutions.

8. Members of the Basle Committee are issuing these proposals in their respective countries. The consultative process will be handled at national level in the first instance and the Committee will coordinate the comments and responses made to its members individually. Eight months will be the maximum period envisaged for consultation (i.e. to end-December 1993).

9. After careful consideration of all the comments received, the Committee will review the proposals with the intention of issuing a formal amendment to the Capital Accord. It is envisaged that an extended transitional period to implementation (i.e. to end-1996 at the earliest) would be needed to enable market participants to develop the necessary reporting and control systems.

SECTION 1

FRAMEWORK FOR APPLYING CAPITAL REQUIREMENTS TO MARKET RISKS

I. Rationale for the proposals

1. The 1988 Accord sets out an agreed framework for measuring capital adequacy and a minimum standard to be achieved by banks engaged in international business. That framework has been progressively implemented in the national supervisory arrangements not only of G-10 member countries but also of a large number of other countries including all the world's major banking centres. The Accord came into full effect on 31st December 1992.
2. While the Accord was mainly directed towards the assessment of capital in relation to credit risk (the risk of counterparty failure¹), it also stated that the Committee was examining other risks which need to be taken into account by supervisors in assessing overall capital adequacy. Deregulation of interest rates and capital controls, the liberalisation of banks' permitted range of activities and the rapid development of financial markets have all increased the opportunities for banks to incur market risks. In particular, banks' trading in derivative products has continued to grow at a rapid rate. Although the recent survey of foreign exchange market activity issued by the BIS reported a slowing-down in the growth of activity between April 1989 and April 1992, foreign exchange trading remains at a high level. Recent experience in the financial markets, particularly in relation to the ERM, has heightened sensitivity to trading risks and reinforced the Committee's belief that supervisors of international banks need to update their supervisory methods to ensure that adequate capital is available to cover banks' exposure to market-related risks.
3. The current proposals are necessarily more complex than existing capital requirements and focus on a somewhat shorter time horizon, commensurate with the difference in perspective between banking

1 For a definition of counterparty risk and some other technical terms used in this paper, a glossary is supplied in Annex 1.

and trading activities. They are not, however, intended to substitute for banks' own internal control and risk management procedures. The management of risk remains the task of banks and not the task of supervisors.

4. Although the prudential objective is similar for each of the three risks, the particular methodologies used to measure risks, the reporting frameworks, and some of the assumptions used in tabulating open positions vary. This reflects the differing characteristics of the foreign exchange, traded debt, and equity markets. The Committee has undertaken substantial statistical research to ensure that the capital charges calculated according to the varying methodologies broadly satisfy a common economic criterion. The test applied was that the capital required should cover adequately a high proportion of the losses that would have been experienced in any two-week holding period in a range of representative portfolios over the last five years.

5. There is no methodology that can fully anticipate price movements of assets or classes of asset based on historical experience. These are therefore minimum standards. As with existing capital requirements, national supervisors would be free to apply higher minimum standards than those indicated to individual banks in their jurisdictions or to their banking systems generally.

6. The Committee favours capital requirements in preference to limits as the appropriate instrument for international convergence in the treatment of market risk. Unlike limits, capital requirements give banks added incentives to use hedging techniques, while ensuring that a prudent capital cushion remains available to cover possible losses. They also enable bank managements to retain flexibility in managing their risks by assessing the risk/reward profile and allocating capital accordingly. Nonetheless, the Committee believes limits have an appropriate place in national supervisory arrangements. Individual national supervisors are encouraged to maintain limits where they judge it appropriate to do so, both as a means of imposing absolute ceilings on banks' exposures and of reinforcing internal controls. For example, supervisors who use limits to restrain position-taking in foreign exchange markets would be free to continue to use limits in conjunction with the proposed capital requirements on open positions.

II. The application of the framework

7. Two issues need to be addressed in determining a capital standard. The first is to calculate how much capital would be required to support varying portfolios of open positions in debt securities, equities and foreign exchange. The second is to define how these capital charges should be met.

(a) Capital requirements

8. The capital charges proposed for debt securities and equities would apply to the current market value of items in banks' trading books.² Trading positions are understood to mean the bank's proprietary positions in financial instruments³ which are taken on with the intention of benefiting in the short term from actual or expected differences between their buying and selling prices or of hedging other elements of the trading book, or which are held for short-term resale, or in order to execute a trade with a customer. Inclusion in or exclusion of items from the trading book would be in accordance with objective procedures including, where appropriate, accounting standards in the institution concerned, such procedures and their consistent implementation being subject to review by the relevant supervisory authority.

9. Items not covered by these criteria, for example those reverse sale and repurchase agreements which are not integral to the trading book, would continue to be subject to the present capital requirements for credit risk as set out in the 1988 Accord, along with other banking assets.⁴ It would also seem reasonable to allow banks to exclude from their trading books derivative products which are taken on explicitly to hedge positions in the banking book. The members of the Committee intend to monitor carefully the way in which banks allocate financial instruments between the trading book and other accounts and will seek to

2 The proposals in respect of foreign exchange risk are designed to apply to banks' total currency positions, some of which would be reported at book value.

3 Including positions in derivative products and interest rate instruments.

4 All interest rate related on and off-balance-sheet positions would fall within the measure of interest rate risk described in the third paper in the present package.

ensure through the examination process or other means that no abusive switching designed to minimise capital requirements occurs. In particular, they will be vigilant in seeking to prevent "gains trading" in respect of securities which are not marked to market, through which banks improve their short-term profitability by realising accrued profits and deferring the realisation of losses. The Committee will seek to clarify over time the appropriate distinction between the trading book and the other business of banks.

10. The proposals for debt securities and equities are based upon the so-called "building block" approach which differentiates specific risk requirements from those for general market risk.⁵ Specific risk is the risk of loss caused by an adverse price movement of a security (or a derivative product linked to it) due principally to factors related to the issuer of the security. Specific risk has some parallels with, but is broader than, credit risk in the sense that it exists whether the position is long or short. General market risk is the risk of loss caused by an adverse market movement unrelated to any specific security. This dual approach has been chosen because it provides a sound conceptual and practical basis for permitting offsetting of matched (i.e. long and short) positions.

11. The proposals for foreign exchange risk are intended to apply specifically to banks, but they could equally well be used by other institutions. There is a two-step approach to the measurement of the risk. The first task is to measure the exposure in each currency, where the main challenge is to decide how to treat derivatives involving foreign currency risk, especially options. The second task is to measure the risks inherent in a mix of long and short positions in different currencies. It is proposed that banks should have a choice between measuring this in a relatively rough broadbrush manner or using computer simulations based on past exchange rate relationships.

12. While the present proposals cover the position risk in foreign exchange, debt securities and equities, they do not address counterparty

5 In discussions with the securities regulators, several have indicated a wish to retain their existing comprehensive measures for equities. This could be acceptable subject to the conditions laid down in paragraph 5 of Section 3.

or settlement risk. However, the 1988 Accord already covers the counterparty risk in some over-the-counter⁶ derivatives by calculating the replacement cost of the contract, measured as the current mark-to-market value (if positive) plus an "add-on" to reflect the potential increase in the exposure over the remaining life of the contract.

13. Each bank affected by these proposals would be expected to monitor and report the position outstanding for each category of risk against which a capital requirement would be applied. The bank's overall minimum capital requirement would be:

- the existing credit risk requirements for the banking business, e.g. loans, investments and the counterparty risk on over-the-counter derivatives;
- the capital charges for debt and equity securities in the trading portfolio, as described in Sections 2 and 3;
- the charges for foreign exchange risk described in Section 4.

14. The market risk proposals could result in a higher or lower aggregate capital requirement than those to which banks are already subject under the present credit risk framework, depending on the risk profile of the individual institution. In the case of debt securities and equities held in the trading book, the proposed market risk charges would substitute for the credit risk weights presently applied to the balance-sheet assets. Whether this would lead to higher capital charges on balance would depend on the pattern of each bank's book and on the category of issuer. A bank with well-hedged positions or with significant holdings of high grade corporate debt securities could well have a lower capital requirement than at present.

15. The measure in respect of foreign exchange risk would in principle be additive in the sense that no compensating reduction in credit risk is being proposed. However, in the simplified approach described in Section 4 on foreign exchange risk, it is proposed to apply a de minimis exemption which would enable those banks with negligible business in foreign currency to escape any capital charge.

6 Instruments traded on approved exchanges which require daily receipt and payment of cash variation margin, where the counterparty risk is in essence an intra-day one, are exempt from counterparty risk weightings in the Accord.

16. Although regular reporting would in principle take place only at intervals (in most countries quarterly), banks would be expected to manage the market risk in their trading portfolio in such a way that the capital requirements would be met on a continuous basis, i.e. at the close of each business day. Supervisors have at their disposal a number of effective measures to ensure that banks do not "window-dress" by showing significantly lower market risk positions on reporting dates. Banks would also, of course, be expected to maintain strict risk management systems to ensure that intra-day exposures are not excessive.

17. In the belief that all risks should be captured when they arise, it is proposed that all transactions, including forward sales and purchases, should be reported on a trade date basis. If, however, its use would not produce a material difference, it is suggested that national authorities could choose to allow settlement date reporting, so long as this was on a continuous basis.

(b) Satisfying the capital charges

18. Once the capital charges have been calculated as described in the preceding paragraphs, the second step is to define how those requirements can be satisfied. The definition of capital for banks set out in the 1988 Accord differs from the definition of capital commonly used for securities firms and from the definition of capital in the EC's Capital Adequacy Directive. This can be justified by the nature of the risks stemming from traditional banking activities and the nature of those arising from trading activities. In particular, bank assets are often illiquid and not easily marked to market, and therefore are typically reported at book value. This treatment is consistent with the inherent going-concern nature of banking, in which recognising short-term fluctuations in the value of assets held for the long run is generally inappropriate. In contrast, trading positions are marked to market frequently, reflecting the shorter-term nature of these positions and the market risk to which they are exposed. Capital requirements for market risk thus tend to be far more volatile than those for credit risk and a more flexible source of capital may be considered appropriate. For example, securities firms are customarily permitted to include in eligible capital a high proportion of short-term subordinated debt, often subject to lock-in provisions, a facility not currently available to banks.

19. Were the proposals to be designed for banks alone, the Basle Committee would favour the retention of the present definition of capital in the Basle Accord to cover all banks' capital requirements. However, it is still hopeful that over time it may be possible to move towards meaningful convergence in the capital requirements of banks and securities houses. It is also aware that many banks affected by these proposals will be operating under the provisions of the Capital Adequacy Directive.⁷ It therefore proposes⁸ that banks be permitted, at the discretion of their national supervisors, to employ an additional form of subordinated debt for the sole purpose of meeting a part of the capital requirements for market risks up to certain limits described in paragraph 21. For such instruments to be eligible, they need, if circumstances demand, to be capable of becoming part of an institution's permanent capital and thus be available to absorb losses. They should, 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 supervisor agrees;
- be subject to a lock-in clause which stipulates that neither interest nor principal may be paid (even at maturity) if such payment would mean that the capital allotted to the trading-book for debt securities and equities would fall below a threshold 20% above the required capital laid down in these proposals.

20. For banks, any such debt would form a third tier of capital, supplementary to the existing tiers 1 and 2. There are three principal

7 However, Article 14 of this Directive requires an examination and, if necessary, a revision of the Directive within three years of its implementation in the light of the experience acquired in applying it "taking into account market innovation and, in particular, developments in international fora of regulatory authorities".

8 One member country objects to the inclusion of tier 3 capital. That country would have been prepared to accept tier 3 if harmonisation had been achieved with securities regulators. It believes, however, that the divergences that currently exist, at both national and international levels, are of such magnitude that it would be inappropriate to widen the definition of capital at this time.

differences between this and the subordinated debt currently permitted as a subset of tier 2 in the 1988 Accord. First, the minimum original maturity is significantly shorter (two years as opposed to five years). Second, the debt is valued at par while in the 1988 Accord it is amortised over the last five years of life. Third, and most important, tier 3 has the lock-in feature which means that, because of the restriction on payment, the debt is effectively available to absorb losses if allotted capital falls below an early-warning level 20% above the minimum. The distinction drawn between tier 2 and tier 3 subordinated debt is not due to judgements about relative quality but to the fact that short-term debt with a lock-in is more appropriate for trading activities whereas longer term debt is more appropriate to normal banking business.

21. The Committee proposes that the following limitations should be applied to the use of tier 3 by banks:

- banks would be entitled to use such debt solely to support the market risks in the trading book for equities and debt securities (including the specific risk in the trading book). This means that any capital requirement arising in respect of banks' foreign exchange risk, or in respect of credit and counterparty risk, would need to be met by the existing definition of capital in the 1988 Accord;
- tier 3 capital would be limited to 250% of tier 1 capital allocated to support securities trading-book risks, which is consistent with the EC's Capital Adequacy Directive applicable to both banks and securities firms. This means that a minimum of about 28½% of trading-book risks would need to be supported by tier 1 capital not required to support risks in the remainder of the book;
- tier 2 elements could be substituted for tier 3 insofar as the overall limits in the 1988 Accord were not breached, that is to say total tier 2 capital could not exceed total tier 1 capital, and long-term subordinated debt could not exceed 50% of tier 1 capital;
- since several members of the Committee do not favour the use of tier 3 capital for banks at all, the Committee is also contemplating, pending further developments in the convergence process more generally, retaining the principle in the present accord that tier 1 capital should represent at least half of

total capital, i.e. that the sum total of tier 2 plus tier 3 capital should not exceed total tier 1.

National supervisors would have discretion to refuse the use of short-term subordinated debt for individual banks or for their banking systems generally.

III. Consolidated supervision of market risk

22. The Committee has for some years strongly supported the concept of consolidated supervision of risk on the grounds that problems in one affiliate could well have a contagion effect on the group as a whole. Consolidated supervision reduces the scope for risks to escape measurement by being held in unsupervised locations and ensures banking groups have group capital to support all their risks, so preventing excessive gearing up on the same capital base. Consistent with the principle of consolidated supervision, it is proposed that supervisors have discretion to permit banking and financial entities in a group which is running a global consolidated book and whose capital is being assessed on a global basis to report short and long positions in exactly the same instrument (e.g. currencies, equities or bonds), on a net basis, no matter in which location they are booked.⁹

23. Nonetheless, because such reporting might well lead to a reduction in the capital charge for market risks by allowing positions in different affiliates to offset, supervisors need to be alert to the possible understatement of risk. This may occur, for example, where there are obstacles to the repatriation of profits from a foreign subsidiary, where there are potential tax liabilities or where a bank's ownership is less than 100%. In such circumstances, supervisors would be expected to demand that the individual positions be taken into the measurement system without any offsetting against positions in the remainder of the group. Moreover, all supervisory authorities would retain the right to continue to monitor the market risks of individual entities on a non-consolidated

9 The positions of less than wholly-owned subsidiaries would be subject to the generally accepted accounting principles in the country where the parent company is supervised.

basis to ensure that significant imbalances within a group do not escape supervision.

24. The Committee is well aware that banks can reduce positions at the close of business by engaging in a transaction with an affiliate in a later time zone (i.e. "passing" its position). This may be a perfectly legitimate device to enable banks to manage their positions continuously or to reduce intra-group imbalances. If all positions were measured at the same moment in time no problem would arise. In practice, however, reporting is likely to take place on the basis of accounts drawn up at the end of a business day and it is possible, by passing a position continuously west and over the date-line, for an exposure to escape reporting altogether. Supervisors will, therefore, be especially vigilant in ensuring that banks do not pass positions on reporting dates to affiliates whose positions escape measurement or across the international date-line.

SECTION 2

DEBT SECURITIES

1. This section describes a framework for measuring the risk of holding or taking positions in debt securities in the trading account. The instruments covered would include all fixed-rate and floating-rate debt securities and instruments that behave like them, including non-convertible fixed-rate preference shares.¹⁰ The basis for dealing with derivative products is considered in III below.

2. The minimum capital requirements would be expressed in terms of two separately calculated charges, one applying to the "specific risk" of each security, whether it is a short or a long 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 could be offset.

I. Specific risk

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

4. In establishing appropriate capital charges for specific risk the Committee has sought to classify debt securities into a number of broad categories of issuer in a manner similar to that used by both

10 Traded mortgage securities and mortgage derivative products possess unique characteristics because of the risk of pre-payment. Accordingly, for the time being, no common treatment is proposed for these securities, which would be dealt with at national discretion. A security which is the subject of a repurchase or securities lending agreement would be treated as if it were still owned by the lender of the security, i.e. it would be treated in the same manner as other securities positions.

banking and securities regulators in their present capital regimes. It is proposed that the specific risk would be graduated in five broad categories as follows:

government	0.00%
qualifying	0.25% (residual maturity 6 months or less)
	1.00% (residual maturity between 6 and 24 months)
	1.60% (residual maturity exceeding 24 months)
other	8.00%

5. The category "government" would include all forms of government¹¹ paper including bonds, Treasury bills and other short-term instruments, but national authorities would reserve the right to apply a specific risk weight to securities issued by certain foreign governments, especially to securities denominated in a currency other than that of the issuing government.

6. "Qualifying" would apply to issues which meet the criteria set out in the following paragraph.¹² Three different weights are proposed depending on the residual maturity of the issue in question. This is because the uncertainty about creditworthiness increases with the life of the security, as reflected in the fact that spreads between corporate and government securities tend to widen along the maturity spectrum.

7. Qualifying items would include securities issued by public sector entities and multilateral development banks, plus other securities that are:

- rated investment-grade¹³ by at least two credit rating agencies specified by the relevant supervisor; or
- rated investment-grade by one rating agency and not less than investment-grade by any other rating agency specified by the supervisor (subject to supervisory oversight); or

11 Including, at national discretion, local and regional governments subject to a zero credit risk weight in the Basle Accord.

12 One country has expressed a general reserve on the definition of the qualifying category.

13 e.g. rate Baa or higher by Moodys and BBB or higher by Standard and Poors.

- unrated, but deemed to be of comparable investment quality by the bank or securities firm, and the issuer has securities listed on a recognised stock exchange (subject to supervisory approval).

The supervisors would be responsible for monitoring the application of these qualifying criteria, particularly in relation to the last criterion where the initial classification is essentially left to the reporting institutions.

8. National authorities would also have discretion to include within the qualifying category debt securities issued by banks in countries which are implementing the Basle Accord, subject to the express understanding that supervisors in such countries would undertake prompt remedial action if a bank fails to meet the capital standards set forth in the Accord. Similarly, national authorities would have discretion to include within the qualifying category debt securities issued by securities firms that are subject to equivalent rules.

9. The "other" category would receive the same specific risk charge as a private-sector borrower under the Basle Accord, i.e. 8%. No maturity breakdown is proposed within this category of specific risk.

10. Consideration has been given to the possibility of determining a specific risk charge higher than 8% for high-yield debt securities, which often have equity-like characteristics. Such securities are commonly traded in only a few markets and their characteristics would not be easy to define, so no standard treatment is proposed. However, it is proposed that either:

- a specific risk charge higher than 8% would be applied to such securities (the precise charge and the criteria being at national discretion); and/or
- offsetting for the purposes of defining the extent of general market risk (see paragraph 18 below) would not be allowed between such securities and any other debt securities.

11. Convertible bonds, i.e. debt issues or preference shares that are convertible, at a stated price, into common shares of the issuer, would be treated as debt securities if they trade like debt securities and as equities if they trade like equities.

II. General market risk

12. Capital requirements for general market risk would be designed to capture the risk of loss arising from changes in market interest rates. A choice between two methods of measuring the risk would be permitted.

(a) The standard method

13. Long or short positions in debt securities and debt related derivative instruments (see III below) would be slotted into a maturity ladder comprising thirteen maturity bands. Fixed rate instruments would be allocated according to the residual term to maturity and floating-rate instruments according to the next repricing date.¹⁴ Opposite positions of the same amount in the same issues (but not different issues by the same issuer), whether actual or notional, incur no interest rate risk and could therefore be omitted from the reporting framework, as could closely matched swaps, forwards, futures and FRAs which meet the conditions set out in paragraphs 32 and 33 below.

14. The first stage in the proposed calculation would be to weight the positions in each time-band by a factor designed to reflect the price sensitivity of those positions to changes in interest rates. The weights proposed have two components: the modified duration¹⁵ of a bond with a maturity equal to the mid-point of the respective time-band, assuming an 8% interest rate environment and an 8% coupon; and an assumed change in yield which is designed to cover about two standard deviations of one month's yield volatility in most major markets.¹⁶ The two numbers are

14 In the case of callable bonds, if a bond is trading above par it would be slotted according to its first call date. If priced below par (making a call unlikely) it would be slotted according to its residual term to maturity.

15 Duration is a mathematical concept designed to measure the price sensitivity of debt securities to changes in interest rates. Modified duration is duration divided by a factor of one plus the interest rate. The term duration used throughout the text refers to modified duration.

16 Since in most countries long-term rates are less volatile than short-term rates, the protection sought diminishes progressively along the yield curve, from a 1% change in interest rates at the short end to a 0.6% change at the long end.

multiplied to give a weighting factor for each time-band, as set out in Annex 2.

15. The duration of a bond, although primarily influenced by its maturity, is also influenced by its coupon. Zero-coupon and deep-discount¹⁷ bonds are much more volatile than coupon bonds; for example, in an 8% interest rate environment, the price of a 30-year zero-coupon bond is more than twice as volatile as that of a 30-year 8% bond. Slotting such bonds according to residual maturity would underestimate risk and allow offsetting between positions where substantial risk is still present. Some adjustments therefore need to be made to slot zero-coupon bonds and deep-discount bonds (which it is proposed to define as bonds with a coupon of less than 3%) into the maturity ladder. This treatment, which in effect converts zero-coupons into the equivalent of 8% bonds, is set out in the second column of Annex 2. At the far end of the maturity ladder, there are two time-bands with higher weights for zero-coupon bonds whose maturities exceed twelve years.

16. 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 ("vertical offsetting"). However, each band would include positions whose maturities are not identical as well as different instruments with the same maturity, exposing the bank to basis risk. The Committee does not believe it would be consistent with its prudential objective to permit full offsetting of longs and shorts and favours a compensating adjustment. The nature of the adjustment would be to disallow some fraction of the offset by applying a "vertical disallowance" factor to the smaller of the offsetting positions, be it long or short. It is proposed that a 10% "vertical disallowance" be applied to one side of the weighted matched positions within each time-band.¹⁸ For example, if the sum of the weighted longs in a time-band is \$100 million and the sum of the weighted shorts \$90 million, the vertical

17 Where the coupon of a debt security appears to be "low coupon" but the coupon and principal are linked to movements in a consumer price index, the securities should be treated as normal coupon debt securities.

18 Several countries would prefer to have a 15% vertical disallowance for the time-bands in zone 1 (see Annex 3), while accepting 10% for the other zones.

disallowance for that time-band would be 10% of \$90 million (i.e. \$9 million).

17. 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 in the example above) and the vertical disallowances, which have no sign. The net short and long positions in different time-bands might also be regarded as offsettable to the extent that interest rates at different points in the maturity spectrum tend to move in step. Observed correlations suggest that the likelihood of divergent movements is lower for nearer segments of the yield curve and higher for more distant segments. It is therefore proposed that there should be two rounds of partial "horizontal" offsetting, first between the net positions in each of the three zones (zero to one year, one year to four years and over four years), and subsequently between the net positions in the different zones. At each stage, the offsetting of opposite positions would be subject to a disallowance (expressed, in the same way as the vertical disallowance, as a fraction of the smaller of the offsetting positions), based on observed correlations of interest rate movements. The disallowances proposed, which are set out in Annex 3, would result in a greater recognition of hedging for offsets taking place within the same zone than for offsets between different zones. The resulting disallowances would be added to the disallowances for vertical offsetting referred to above, and to the absolute amount of the residual net short or long position within the whole book. The total would be the market risk charge for the portfolio which, together with the specific risk charges for each issue referred to in Section I above, would be the institution's overall capital requirement under the standard measurement method. A simplified example of the calculations required is set out in Annex 4.

18. In accordance with the concerns about high-yield debt securities expressed in paragraph 10 above, it is intended that no vertical or horizontal offsetting between such securities and any other debt securities would be permitted unless high-yield debt securities were made subject to a higher specific risk weight than 8%.

19. It is proposed that separate reporting ladders be used for each currency, except for those in which business is insignificant, and that capital charges be calculated for each currency separately with no offsetting between positions of opposite sign. It is recognised that such

treatment would be rather harsh since it assumes a worst-case scenario in the movements of interest rates in different currencies. On the other hand, the purpose of the proposals is to provide protection against movements in interest rates over relatively short periods and while some correlation across currencies is observable circumstances quite frequently occur in which interest rates in different countries move in opposite directions. It might be possible to devise a practical method of recognising such partial correlation between the interest rates in different countries¹⁹ and comment is invited on this aspect.

(b) The alternative method

20. It is proposed that institutions with the necessary capability could, with their supervisors' consent, use a more accurate method of measuring duration by calculating the price sensitivity of each position separately. This would involve taking into account the exact coupon of each bond, rather than an assumed 8% rate, and calculating duration according to the precise residual maturity of the instrument rather than the mid-point of a time-band. Recognising that the alternative method is similar to and more accurate than the standard method, the Committee would be content for this method to be used so long as those who use it demonstrate that it produces results which are consistently equivalent with the standard method.²⁰ Institutions would be required to elect and

19 A possible approach favoured by one delegation would be to allow partial offsetting of the final residual unmatched position in all currencies by taking the larger of the sum of shorts and longs.

20. In order to be certain of producing equivalent results, i.e. those that do not result in any systematic bias, the following processes would need to be followed:

- the institution would 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 (using the same scale as in column B of Annex 2);
- the resulting sensitivity measures would then be slotted into a duration-based ladder with fifteen time-bands as set out at the foot of the table in Annex 2;
- long and short positions in each time-band would be subject to the 10% vertical disallowance;
- the net positions in each time-band would be carried forward for horizontal offsetting subject to the disallowances set out in Annex 3.

use the method on a continuous basis (unless a change in method is approved by the national authority) and subject to supervisory monitoring of the systems used.

21. Certain members of the Committee believe that there is some justification for using a lower vertical disallowance than 10% for the alternative method, in recognition of the greater accuracy which makes it no longer necessary to account for maturity mismatches within each time-band.²¹ Comment is invited on this matter, bearing in mind that the vertical disallowance is also designed to capture basis risk, which would still be present.

III. Debt derivatives

22. It is proposed to include in the measurement system those debt derivatives and off-balance-sheet instruments which react to changes in interest rates and thus affect the reporting institution's exposure to market risk. This would include forward rate agreements (FRAs), futures and options on debt instruments, interest rate and cross-currency swaps and forward foreign exchange positions. A similar methodology would apply to other option-like products, such as caps, floors, and options on futures or swaps.

23. In principle, all derivatives (except for those held outside the trading book) would be converted into positions in the relevant underlying and become subject to the proposals for applying specific and general market risk under the building-block methodology. There would, however, be the possibility of alternative treatments for options which are considered in Annex 5. A summary of the proposals for dealing with debt derivatives is attached at Annex 6.

1. Reporting of positions

24. In order to calculate the standard building-block formula described above, positions in derivatives would need to be converted into notional security positions. Thus the amounts reported would be the

21 One country sees no need for time-bands at all since the alternative method is maturity-specific. Other delegations, however, insist on the need for time-bands in order to calculate the horizontal disallowances.

market value of the principal amount of the underlying or notional underlying.

(a) Futures and forward contracts, including forward rate agreements

25. These instruments would be treated as a combination of a long and a short position in a notional government security. The maturity of a future or an FRA would be the period until delivery or exercise of the contract, plus - where applicable - the life of the underlying security. For example, a long position in a June three month interest rate future (taken in April) would 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 fulfil the contract, the institution would be free to elect which deliverable security goes into the maturity ladder. In the case of a future on a corporate bond index, positions would be included at the market value of the notional underlying portfolio of securities.

26. A few members believe that a two-legged treatment for futures and forwards would be a needless complexity which only captures a small financing cost. In particular, there would be very little difference for a short-term future when the instruments deliverable against the future have long maturities. These members would prefer an approach that slots in the value of the securities that are deliverable against the futures contract. In at least some cases, the two-legged approach would require less capital because the financing leg would be allowed to hedge other unrelated positions in the underlying itself when the deliverable is short-term in nature.

(b) Swaps

27. Swaps would be treated as two notional positions in government securities with relevant maturities. For example, an interest rate swap under which a firm is receiving floating rate interest and paying fixed would 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. an equity index, the interest rate component would 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 would be reported in the relevant maturity ladders for the currencies concerned.

(c) Exchange-traded and OTC options

28. The treatment of options poses problems because of the asymmetrical risk and the inherent complexity of the products. The proposals on this topic are therefore less definitive than for most other elements of the framework and comments from practitioners would be especially welcome. It is proposed that there should be a choice between two or perhaps more methods at the discretion of the individual supervisor. Only one of the methods identified in this paper would be compatible with the building-block methodology and the reporting procedure is described below. Two other possible methods are referred to in Annex 5.

29. The approach to be used for the treatment of options within the building-block methodology would be for institutions to report their options positions on a delta-weighted²² basis (such deltas to be calculated according to an approved exchange model or the institution's proprietary options pricing model subject to oversight by the supervisor). Options would thus be reported as a position equal to the market value of the underlying multiplied by the delta. Annex 5 invites comment on the appropriateness of some additional capital requirement for those using the delta-based approach.

30. In slotting deltas into the time-bands, a two-legged approach could be 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 future would 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. The written option would be similarly slotted as a long position with a maturity of two months and a short one with a maturity of five months.

22 This treatment would also encompass a simplified proxy of delta.

31. Floating rate instruments with caps or floors would be treated as a combination of floating rate securities and a series of European-style options. For example, the holder of a three-year floating rate bond indexed to six month LIBOR with a cap of 15% would treat it as:

- (1) a debt security that reprices in six months; and
- (2) a series of five written call options on a FRA with a basis 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.

2. Calculation of capital charges under the standard building-block methodology

(a) Allowable offsetting of matched positions

32. Long and short positions (both actual and notional) in identical instruments with exactly the same issuer, coupon, currency and maturity would be offsettable and thus fully matched positions would be excluded from the reporting framework altogether (for both specific and general market risk). A matched position in a future and its corresponding underlying could be offset except when the future comprises a range of deliverable instruments. No offsetting would be allowed between positions in different currencies.²³ Thus the separate legs of cross-currency swaps or forward foreign exchange deals would be treated as notional positions in the relevant instruments and entered on the appropriate currency reporting form.

33. In addition, opposite positions in the same category of instruments could in certain circumstances be regarded as matched and allowed to offset fully. This would have the effect of removing, for example, closely matched swap positions from the need to apply a 10% disallowance to the matched long and short positions in each time-band. To qualify for this treatment the positions would need to relate to the same underlying instruments, be of the same nominal value and denominated in the same currency. In addition:

- (i) for futures: offsetting positions in the notional or underlying instruments to which the futures contract relates

²³ But see paragraph 19.

would need to be for identical products and mature within seven days of each other;

- (ii) for swaps, FRAs: the reference rate (for floating rate positions) would need to be identical and/or the coupon (for fixed-rate positions) closely matched (i.e. within 10 - 15 basis points);
- (iii) for swaps, FRAs and forwards: the next interest fixing date or, for fixed coupon positions or forwards, the residual maturity would need to correspond within the following limits:
 - less than one month hence: same day;
 - between one month and one year hence: within seven days;
 - over one year hence: within thirty days.

34. The Committee invites comment on an alternative approach for sophisticated institutions with large swap books which could use sensitivity models to calculate the positions to be included in the maturity ladder. These models would take all cash flows on swaps discounted using zero coupon rates and convert them into a portfolio of bonds (with the same interest rate sensitivities at the appropriate maturities), which would then be subject to the building-block approach. This procedure would capture more closely the true risk in large swap books.

Such models could, however, only be allowed if:

- the supervisor were fully satisfied with the accuracy of the systems being used;
- the positions calculated were fully to reflect the sensitivity of the cash flows to interest rate changes;
- the positions were denominated in the same currency.

Once slotted into the maturity ladder, the net position produced by these models would be subject to the usual disallowance factors.

(b) Specific risk

35. Specific risk is intended to address the credit-related and liquidity risks associated with the underlying instrument. The majority of interest-rate sensitive off-balance-sheet instruments relate to an underlying or notional underlying security which does not bear an identifiable specific risk, e.g. currencies or market interest rates. Thus interest rate and currency swaps, FRAs, forward foreign exchange

contracts and interest rate futures and options would not be subject to a specific risk charge. This exemption would also apply to futures and options on a short-term (e.g. LIBOR) interest rate index. However, in the case of futures and options contracts where the underlying is a debt security, or an index representing a basket of debt securities, a specific risk charge would apply according to the credit risk of the issuer as set out in I above. This would require separate reporting outside the maturity schedule referred to below. For governments, specific risk would be zero.

(c) General market risk

36. General market risk would apply to positions in all derivative products referred to in this section in the same manner as for cash positions, subject only to an exemption for fully or very closely matched positions in identical instruments as defined in paragraphs 32 and 33. The various categories of instruments would be slotted into the maturity ladder according to the reporting rules identified earlier. As with cash securities, offsetting would be permitted for opposite positions within each maturity band, subject to a 10% vertical disallowance, and also between different maturity bands and zones according to the scale of horizontal disallowances set out in Annex 3.

SECTION 3

EQUITIES

1. This section proposes a minimum capital standard to cover the risk of holding or taking positions in equities in the trading account. Comment on this aspect of the proposals is especially invited in view of the difficulty of structuring common rules that would adequately cover the price risk in different equity markets. This is a matter on which securities regulators have different views according to national perspectives in their own markets. The treatment proposed below represents the Basle Committee's preferred approach, but it could be modified in further discussions with securities regulators.

2. The proposed treatment for equities would be applied to long and short positions in all instruments that exhibit market behaviour similar to equities, but would not apply to non-convertible preferred shares.²⁴ It is envisaged that long and short positions in the same issue could be netted. Instruments covered would include common stocks, whether voting or non-voting, warrants that give the holder the right to purchase equity securities, those convertible securities that behave like equities, options on equity securities, commitments and other rights to buy or sell equity securities and limited partnership interests. The proposed treatment of derivative products, equity indices and index arbitrage is described in II below.

I. Specific and general market risk

3. As with debt securities, it is proposed that the minimum standard for equities should be expressed in terms of the so-called "building-block approach". This means that the overall capital requirement would consist of separately calculated charges for the "specific" risk of holding a long or short position in an individual equity, and for the "general market risk" of holding a long or short position in the market as a whole. Specific risk has some parallels with,

24 Non-convertible preferred shares are covered by the debt securities requirements described in section 2.

but is broader than, credit risk in the sense that it exists whether the position is long or short. General market risk is the risk of a broad market movement unrelated to any specific securities. The long and short position in the market would be calculated on a market-by-market basis, i.e. a separate calculation would have to be carried out for each national market in which the firm held equities.

4. It is proposed that the building-block approach should apply in the following manner. The minimum standard would be expressed in terms of an "x plus y" formula, in which "x", denoting specific risk, would apply to the reporting institution's gross equity positions (i.e. the sum of all long equity positions and of all short equity positions) and "y", or general market risk, would apply to the difference between the sum of the longs and the sum of the shorts (i.e. the overall net position in an equity market).

5. If, in the future, wider convergence with securities regulators can be achieved, it is proposed that individual national authorities should have discretion to continue to apply a comprehensive approach, i.e. one that combines specific and general market risks in a single risk charge. To use such an approach, the individual regulator would be required to demonstrate to the satisfaction of his fellow regulators that such an approach would produce, in all circumstances, capital charges equal to or greater than those produced by the minimum "building-block" approach. This demonstration could be made by showing that the authority's rule, by its very nature, required capital charges equal to or greater than the building-block methodology.

6. In setting appropriate charges for the x plus y formula, the Committee proposes that the charge for y (general market risk) should be 8% of the net open position. This number was reached on the basis of analysis in collaboration with securities regulators of the price volatility of the principal equity indices in the major markets.

7. The criteria for determining the x factor for specific risk need to reflect the diversification of the portfolio and the extent to which it contains liquid and marketable stocks. It is important to ensure that a relatively high "x" factor applies unless the portfolio is both liquid and well-diversified. It is proposed that an appropriate x factor in the absence of any such assurances should be 8%.

8. Although the Committee accepts that a lower x factor should apply for major institutions whose portfolios are liquid and diversified,

it has proved extremely difficult to define liquidity and diversification in a sufficiently tight manner to be used for establishing a common minimum standard. Criteria for liquidity could include turnover, the number of market-makers or belonging to a major index. Diversification could be established by portfolio methodology or by some simple rule requiring concentrations above a certain threshold to carry a higher charge or requiring a minimum number of evenly spread holdings. However, national market characteristics are crucial. Comment is invited on adequate common criteria for liquidity and diversification.

9. In the light of these difficulties, all members of the Basle Committee are content to allow national regulators discretion to determine their own criteria for liquid and diversified portfolios so long as x is not set lower than 4% and on the understanding that a minimum of 8% would apply to portfolios of stocks that fail to meet the liquidity and diversification test. Annex 7 illustrates the capital required for a range of hypothetical portfolios which qualify for 4% (i.e. a 4 plus 8 formula).

II. Equity derivatives

10. It is proposed to include in the measurement system equity derivatives and off-balance-sheet positions which are affected by changes in equity prices. This would include futures and options on both individual equities and on equity indices, as well as instruments with option-like characteristics such as options on futures and warrants.

11. In principle, all derivatives (except for those held outside the trading book) would be converted into positions in the relevant underlying and become subject to the proposals described. There would, however, be the possibility of alternative treatments for options which are considered in Annex 5. A summary of the proposals for dealing with equity derivatives is attached at Annex 8.

1. Reporting of positions

12. In order to calculate the standard $x + y$ formula, positions in derivatives would need to be converted into notional equity positions.

(a) Futures and forward contracts relating to individual equities

13. These instruments would in principle be reported at current market prices.

(b) Futures relating to equity indices

14. These instruments would be reported as the marked-to-market value of the notional underlying equity portfolio.

(c) Equity swaps

15. Equity swaps would 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 equity index and paying a different index would 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 maturity band in the reporting form covering debt securities. The stock index would be covered by the equity treatment.

(d) Exchange-traded and OTC options²⁵

16. The proposed treatment of equity options would be exactly the same as for options whose underlying is a debt instrument. One method, therefore, would be for options to be reported as a position equal to the market value of the underlying multiplied by the delta (or a simplified proxy of delta). Alternative treatments are described in Annex 5.

2. Calculation of capital charges

(a) Measurement of specific and general market risk

17. In calculating the x and y factors referred to in Part I, matched positions in each identical equity in each market may be fully offset, resulting in a single net short or long position on which the x and y charge will apply. Thus a future in a given equity may be offset against an opposite cash position in the same equity.

(b) Specific risk in relation to an index

18. Where the underlying is an index representing a diversified portfolio of equities, the specific risk (i.e. the risk of divergence from the general market level) would be less than for a random sample of equities and a lower x factor than that applied to ordinary equities might be justified. However, even an index which closely matches the main stocks traded can move against the market so a nil weight is not favoured by most supervisors. It is proposed that a standard x factor of 2% should

25 Warrants would be treated in the same manner as options.

apply to the net position in an index comprising a diversified portfolio of equities. The national supervisory authorities would take care to ensure that this treatment applies only to well-diversified indices and not, for example, to sectoral indices.

(c) Arbitrage

19. Consideration needs to be given to the possibility of partial offsetting for futures-related arbitrage strategies where the full specific risk charge may seem unduly harsh. Two such circumstances are:

- when an institution takes opposite positions in exactly the same index at different dates (in which case the indices will move in price very closely, the difference between the prices being mainly the cost of carry);
- when an institution has opposite positions in different but similar indices at the same date (subject to supervisory oversight that the two indices contain sufficient common components to justify offsetting).

Comment is invited on the proposition that in these two circumstances the 2% factor proposed in paragraph 18 above should apply to only one index and not both.

20. Consideration also needs to be given to situations in which institutions have taken opposite positions in their cash book and in an index future or option. This can be done either to hedge a cash position or to arbitrage between prices in the cash and futures (or options) market (known as equity index arbitrage). While such strategies probably involve lower specific risk than having opposite positions in two unrelated equities, there are still two risks that arise: divergence risk (the risk of imperfect portfolio tracking) and execution risk (the risk of imperfect synchronisation, which at its worst may involve an inability to deal).

21. Since applying the full "x plus y" treatment to cash and futures (or options) positions that are closely matched would be relatively onerous, some favour allowing firms to carve out the arbitrage and apply a special treatment outside the "x plus y" system. For such deliberate arbitrage strategies, in which a futures or options contract on a broadly-based index matches a basket of securities, the Committee proposes that institutions be allowed to remove these positions from the building-block methodology on condition that:

- (i) the trade has been deliberately entered into and separately controlled;
- (ii) the basket of stocks represents at least 90% of the market value of the index;
- (iii) there is a minimum capital requirement of 4%, i.e., 2% of the gross value of the positions on each side to reflect divergence and execution risks. This would apply even if all of the securities comprising the index were held in identical proportions;
- (iv) any excess value of the securities comprising the basket over the value of the futures contract or excess value of the futures contract over the value of the basket is treated as an open long or short position.

22. Other common arbitrage strategies which would appear to merit concessionary treatment under the standard x plus y methodology include position-taking in depository receipts, warrants or convertibles against opposite positions in the underlying equity. The proposed treatment of these strategies would be to permit full offsetting against the underlying equity provided that capital is required to cover any loss on conversion (or exercise in the case of warrants). The regulators would also be vigilant in ensuring that where a short position is taken in a warrant or a convertible, no offsetting would be permitted unless its market is sufficiently liquid and its price moves directly in line with the price of the underlying.

SECTION 4

FOREIGN EXCHANGE RISK

1. Exchange rates are volatile and open short or long currency positions can lead to sizeable losses. Capital thus needs to be held to cover such possibilities. This section describes proposed capital requirements on open foreign exchange positions. It does not propose supervisory requirements for defining and limiting undue concentrations of currency positions or counterparty exposures, which national supervisors are nonetheless encouraged to address.

2. There are three distinct tasks in the process of setting capital requirements on banks' open currency positions. The first is to measure the exposure in a single currency position. The second is to measure the risks inherent in a bank's mix of long and short positions in different currencies. The third is to determine an appropriate capital charge.

I. Measuring the exposure in a single currency

3. The bank's net open currency position in each currency would be calculated by summing the following elements:

- 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);

- the net delta (or delta-based) equivalent of the total book of foreign currency options;²⁶
- depending on particular accounting conventions in different countries, any other item representing a profit or loss in foreign currencies.

4. Trading by banks in gold and precious metals is often regarded as an extension of foreign exchange trading. However, the price volatility of precious metals is significantly greater than most exchange rates and closer to that of other commodities. If specific capital requirements were to be developed to cover commodity positions, some or all precious metals could be included. For the time being and in the absence of such requirements it is proposed that precious metal positions be included within the scope of foreign exchange capital requirements. Where this is done, long positions presently subject to the existing credit risk related requirements in the Basle Accord would cease to be so.

5. Positions in composite currencies, such as the ECU, would need to be separately reported but, for measuring banks' open positions, may be either treated as a currency in their own right or split into their component parts on a consistent basis.

6. Four aspects call for more specific comment: the treatment of interest, other income and expenses; the measurement of forward currency positions; the treatment of currency options; and the treatment of "structural" positions.

(a) The treatment of interest, other income and expenses

7. Interest accrued (i.e. earned but not yet received) would be included as a position. Accrued expenses would also be included. Unearned but expected future interest and anticipated expenses would usually be excluded unless the amounts are certain and banks have taken the opportunity to hedge them. If reporting institutions include future income/expenses they should do so on a consistent basis, and not be permitted to select only those expected future flows which reduce their position.

26 If the alternative treatments described in paragraphs 11 and 13 are used, the option together with related open and forward positions would be treated separately.

(b) The measurement of forward currency positions

8. Forward currency positions would normally be valued at current spot market exchange rates. Using forward exchange rates would result in the measured positions reflecting current interest rate differentials, which would normally be taken into account in measuring a bank's interest rate exposure.

9. For some banks an alternative method would be to discount forward positions to net present value. This recognises that cash flows occurring at different future dates have different values if measured in terms of their present value to the bank. Where this is the basis of the bank's normal management accounting, using net present values would be an acceptable way of measuring currency positions for supervisory purposes.

(c) The treatment of currency options

10. The most difficult instruments to fold into a risk measurement system are options. The main complication is that the price of an option does not move in a one-for-one relationship with the spot rate of the deliverable currency, since an option's value is a complex function of the spot rate of the underlying currency, its volatility, interest rate differentials, the strike price and the option's remaining term.

11. Nevertheless, the purchase of an option can be a useful means of hedging other positions, since it provides the holder with a form of insurance, the cost of which is represented by the option premium. For institutions which do not trade a portfolio of options but which find it convenient to use purchase options as hedges, it is proposed that both the options and the hedged positions would be carved out of the foreign exchange book and that the following treatment would be applied:

- for a long position (spot or forward) hedged by a long put; or a short position hedged by a long call, the capital charge would be 8% of the position being hedged less the amount by which the option is in the money (if any);²⁷

27 e.g. if a German bank has a long forward position of US\$ 100 million hedged by a corresponding put option with a strike price of 1.45 DM/dollar, with the current exchange rate being 1.40 DM/dollar the capital charge would be:

8% x DM 140 million - [DM 145 million - DM 140 million] = 11.2 - 5 = DM 6.2 million.

- where a long call/long put is held outright (i.e. not held as a hedge), the capital charge would be the lesser of (1) 8% of the market value of the underlying and (2) the market value of the option.

12. For institutions which are actively trading options and will therefore wish to manage their risk on a portfolio basis, a measure in general use is the net delta (or delta-based) equivalent of the total book of foreign currency options. However, delta hedging is effective only for small changes in spot rates and there are other variables, notably volatility, not captured in the delta. It is proposed that the net delta value will be used as the measure of exposure for major option players, the deltas being calculated according to an exchange model or internal pricing model approved by the supervisor. In addition, managements would be expected to apply additional internal safeguards to deal with the other option risks, for instance by simulating the performance of portfolios over ranges of possible levels of spot rates, volatilities and interest rate differentials.

13. National supervisors would be ready to consider more advanced approaches for capturing the risks in option positions and related spot or forward positions which sophisticated trading institutions may wish to propose. The criteria for the acceptance of such methods as alternatives to the delta measure would be that they should provide a more reliable estimate of possible loss according to parameters set by the regulators, and that they allow supervisory oversight in a cost-effective manner. For example, these parameters could be designed to cover the highest loss in the bank's foreign exchange options (and related spot or forward positions) portfolio assuming certain changes (on a currency pair by currency pair basis) in foreign exchange rates and implied volatilities. Comments and suggestions on what such parameters should be would be welcomed.

(d) The treatment of structural positions

14. A matched currency position will protect a bank against loss from movements in exchange rates, but will not necessarily protect its

If the dollar appreciates to over 1.45 DM/dollar the option would be out of the money and the capital charge would just be 8% of the dollar forward position.

capital adequacy ratio. If a bank 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 the domestic currency the bank can protect its capital adequacy ratio, although the position would lead to a loss if the domestic currency were to appreciate.

15. It is proposed that supervisors should be free to allow banks to protect their capital adequacy ratio in this way. Thus, any positions which a bank has deliberately taken in order to hedge partially or totally against the adverse effect of the exchange rate on its capital ratio could be excluded from the calculation of net open currency positions, subject to each of the following conditions being met:

- such positions would need to be of a "structural", i.e. of a non-dealing, nature (the precise definition to be set by national supervisors according to national accounting standards and practices);
- the national supervisor would need to be satisfied that the "structural" position excluded does no more than protect the bank's capital adequacy ratio;
- any exclusion of the position would need to be applied consistently, with the treatment of the hedge remaining the same for the life of the assets or other items.

16. The same treatment could be applied to positions related to items that are deducted from a bank's capital when calculating its capital base.

II. Measuring the foreign exchange risk in a portfolio of foreign currency positions and setting the capital requirement

17. Any risk measurement framework involves a trade-off between simplicity and accuracy. To take account of correlations between exchange rate relationships and their differing volatilities would require a complex measure, which might be unduly burdensome. However, a simpler measure based on an assumption about the composition of an average portfolio of currency assets and liabilities may require a conservative bias if portfolios of higher than average risk are not to be undercharged.

18. It is proposed to resolve this by allowing a choice between two alternative measures at supervisory discretion; a "shorthand" method; and a more complex "simulation" method, in which capital requirements would be determined by simulating the likely outcome from holding the bank's actual portfolio. The simulation method would only be available to banks which can satisfy their national supervisors of the adequacy of their measurement and control systems and of their access to the necessary data. It is intended that the two methods should deliver broadly equivalent capital requirements for a well diversified portfolio of foreign exchange positions of average riskiness.

A. The shorthand method

19. Under this method the nominal amount²⁸ of the net position in each currency and of the net position in each precious metal would be converted at spot rates into the reporting currency.²⁹ The net open position would be measured by aggregating:

- the sum of the short positions or the sum of the long positions, whichever is the greater;³⁰ plus
- the total of each net position (short or long) in any precious metal, regardless of sign.

Annex 9 shows a simplified example of the shorthand measure.

28 Or net present value in the case of those banks using net present value for measuring currency positions (see paragraph 9).

29 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 it is suggested that the internal limit in each currency be used as a proxy for the positions. Provided there is adequate ex post monitoring of actual positions against such limits, the limits would be added, without regard to sign, to the net option position in each currency. One country is in favour of allowing the substitution of limits only up to a maximum threshold expressed as a percentage of capital.

30 An alternative calculation, which produces an identical result, would be to include the reporting currency as a residual and to take the sum of all the short (or long) positions.

20. The shorthand method assumes some, but not perfect, correlation between the movements of different exchange rates. Cross currency position taking would neither be unduly penalised nor given undue preference. However, the method would not recognise cross-hedging in the case of precious metals, the price volatility of which seems to justify a more conservative treatment.

21. The Committee proposes a capital requirement of 8% of the net open position as calculated above. This would ensure an adequate level of protection against losses for most portfolios, and be broadly in line with that proposed for interest rate and equity position risks in average portfolios.

22. The Committee sees merit in permitting a "de minimis" exemption for banks with negligible business in foreign currency and which do not take foreign exchange positions for their own account. Accordingly, national supervisors would have discretion to exempt a bank from capital requirements on its foreign exchange positions provided that:

- its foreign currency business (defined as the greater of the sum of its gross longs and the sum of its gross shorts, including precious metals) does not exceed 100% of its capital as defined in the 1988 Accord; and
- its net open position as defined in paragraph 18 above does not exceed 2% of its capital.³¹

Comments are invited as to whether the increase in a bank's capital charge which would result from its crossing of one of the two thresholds is significant enough to raise problems and, if so, on possible ways to alleviate them.

B. The simulation method

23. The simulation method is conceptually simple: the actual exchange rates experienced in a defined past observation period would be

³¹ Two countries have reservations about expressing a de minimis exemption in this manner, and, pending further discussion and more thorough consideration of the issue, are in favour of a free zone approach exempting 2% of a bank's capital base from the net open position.

used to revalue the bank's present foreign exchange³² positions and - from those revaluations - to calculate "simulated" profits and/or losses which would have arisen if those positions had remained fixed for a defined holding period. The capital requirement would be set in relation to the worst or near to the worst simulated loss which would have arisen during that period.

24. In practice, however, it is a demanding exercise. A continuous run of exchange rates over the period for all the currencies in which significant positions are held would be needed. The consistency of data used by different banks would be important and each national supervisor would need to monitor closely the data used in the simulation process. This could be achieved either by defining a common and precise specification of the rates to be applied, leaving the banks with the responsibility of collating the actual rates, or by providing them with exchange rates data series.

25. Policy decisions would have to be taken on four parameters if the simulation method were to be used as a measure of risk:

- the period for which a bank is assumed to hold a position, and during which losses could accumulate;
- the period of observation of exchange rates necessary to be sure of capturing sufficient evidence of currency volatility;
- the level of confidence required in measuring the risk for the purpose of setting a capital requirement;
- the scaling factor used to set the toughness of a capital charge, depending on what is seen as an appropriate buffer against possible losses.

26. The choice of holding period depends on the speed with which banks can be expected to close out loss-making positions. Banks may argue that they are able to cover positions within a single day, but in periods of high exchange rate volatility and thin markets it may well not be possible to close sizeable positions so quickly. Moreover, banks may decide to run loss-making positions in the expectation that they will

32 Precious metals positions would also be eligible for treatment under the simulation method. Option positions in currencies or precious metals would be included on the basis of their net delta (or delta-based equivalent).

become profitable. Since exchange rates often move in one direction for some time, the longer the holding period the larger the losses could be. A holding period of two weeks (i.e. ten working days) is proposed. It would be rolled on daily, so that with each succeeding day the holding period would cease to include the earliest day included in the last holding period.

27. The next step is to determine the length of the observation period which adequately captures relationships between currencies. This depends on how confident one is that future currency volatility will mirror that exhibited in the recent rather than more distant past. A five-year period has been chosen as sufficiently long to avoid over-reliance on recent exchange rate movements while still being practical and not too burdensome to run. It is less necessary that the observation period rolls on daily, but at a minimum it should be updated at regular reporting dates. There would thus be some 1,300 observations for the value of each currency position (i.e. 5 working days x 52 weeks x 5 years).

28. It is then necessary to identify the level of confidence required in measuring the risk for the purposes of setting capital requirements. This could be the worst loss, or be expressed in terms of loss quantiles, for example the level which includes 95% of the hypothetical losses that would have arisen from the bank's current set of open positions. It is important not to confuse the required level of confidence in measuring the risk with the toughness of the capital requirement. They are quite independent.

29. Setting the required level of confidence as the worst loss appears simple and prudentially appealing, but it has conceptual and practical drawbacks. From a conceptual point of view, in placing complete weight on the most extreme situation, it is very sensitive to the choice of observation period. In emphasising the importance of the abnormal event, it would also maximise the problem of the asymmetry of result that the simulation method could deliver depending on whether a short or a long position is held in one particular currency whose exchange rate has consistently appreciated or depreciated in the past. From a practical point of view, it has the disadvantage of putting a very high stress on data series quality. These disadvantages progressively lessen if the level of confidence required is lower, but that benefit is offset by the greater chance of missing an exchange rate movement which may

recur in the future. The 95% quantile, which corresponds to the sixty-fifth largest loss out of 1,300 observations, is proposed.

30. The final step is to select the scaling factor which determines the toughness of the capital requirement. The first three parameters having been fixed, adding to the 95% quantile a scaling factor of somewhere between 2% and 4% of the overall net open position as measured under the shorthand method would deliver approximate equivalence in terms of toughness of the capital requirement for a portfolio of average riskiness between the shorthand and the simulation methods. The Committee is continuing to test bank portfolios to help it come to a final view, but at present inclines towards 3%. Setting the scaling factor in this way would mean that the minimum capital requirement would never be less than 3%.

Glossary

At-the-money: an option is at-the-money when the price of the underlying instrument is equal to the option's exercise price.

Basis risk: the risk that the relationship between the prices of two similar, but not identical, instruments will change. Thus, even if maturities are perfectly matched, basis risk could remain.

Building-block approach: a method for measuring price risk which disaggregates risk specific to a security/issuer and general market risk.

Confidence level: the degree of protection observed against price movements judged appropriate in setting a capital requirement.

Convertible bond: a bond which gives the investor the option to switch into equity at a fixed conversion price.

Counterparty risk: the risk that the counterparty to a financial contract will not meet the terms of the contract.

Currency swap: a transaction involving an initial exchange of principal of two different currencies. Interest payments are exchanged over the life of the contract and the principal amounts are repaid either at maturity or according to a predetermined amortisation schedule.

Deep discount bonds: all interest-earning assets with coupon rates of 3% or less (see zero-coupon bonds).

Delta: the expected change of an option's price as a proportion of a small change in the price of the underlying instrument. An option whose price changes by \$1 for every \$2 change in the price of the underlying has a delta of 0.5. The delta rises toward 1.0 for options that are deep in-the-money and approaches 0 for deep out-of-the-money options.

Delta hedging: a method option traders use to hedge risk exposure of options by the purchase or sale of the underlying asset in proportion to the delta. A delta-neutral position is established when the option trader strictly delta-hedges so as to leave the combined financial position in options and underlying instruments unaffected by small changes in the price of the underlying.

Duration: a mathematical concept designed to measure the price sensitivity of debt securities to small parallel changes in interest rates. Specifically, duration is the weighted average maturity of all payments of a security, coupons plus principal, where the weights are the discounted present values of the payments. Modified duration is duration divided by a factor of one plus the interest rate.

European-style option: an option which may be exercised only on the expiration date. An alternative to an American option, which can be exercised at the holder's initiative prior to expiration.

Exercise price (also Strike price): the fixed price at which an option holder has the right to buy, in the case of a call option, or to sell, in the case of a put option, the financial instrument covered by the option.

Forward: a commitment to buy (sell) an asset at a future date for a price determined at the time of commitment, usually reflecting the net cost of carry. May be applied to currencies, equities, commodities or other assets.

Forward rate agreement (FRA): a contract in which two counterparties agree on the interest rate to be paid on a notional deposit of specified maturity at a specific future time. Normally, no principal exchanges are involved, and the difference between the contracted rate and the prevailing rate is settled in cash.

Futures contract: an exchange-traded contract generally calling for delivery of a specified amount of a particular grade of commodity or financial instrument at a fixed date in the future.

Gamma: the sensitivity of an option's delta to small changes in the price of the underlying; alternatively, the sensitivity of a delta-hedged position to large unit changes in the price of the underlying.

General market risk: the risk of a general market movement arising from, for example, a change in interest rates or official policy.

Hedge: to reduce risk by taking a position which offsets existing or anticipated exposure to a change in market rates or prices.

Holding period: the length of time that a financial institution is assumed to hold a given financial instrument for the purpose of calculating price volatility.

Interest rate risk: the risk that changes in market interest rates might adversely affect an institution's financial condition.

Interest rate swap: a transaction in which two counterparties exchange interest payment streams of differing character based on an underlying notional principal amount. The three main types are coupon swaps (fixed rate to floating rate in the same currency), basis swaps (one floating rate index to another floating rate index in the same currency) and cross-currency interest rate swaps (fixed rate in one currency to floating rate in another).

In-the-money: option contracts are in the money when there is a net financial benefit to be derived from exercising the option immediately. A call option is in the money when the price of the underlying instrument is above the exercise price and a

put option is in the money when the price of the underlying is below the exercise price.

Investment-grade: securities which are rated at or above Baa by Moody's Investors Services or BBB by Standard & Poor's Corporation.

LIBOR: London Interbank Offered Rate. The rate at which banks offer to lend funds in the international interbank market.

Lock-in clause: a clause in a subordinated loan contract stipulating that neither principal nor interest may be paid, even at maturity, if such payment would bring the issuer's capital below a given regulatory level.

Long option position: the position of a trader who has purchased an option regardless of whether it is a put or a call.

Margin: in this report, margin refers to a good-faith deposit (of money, securities or financial instruments) required by a futures or commodity exchange to assure performance. Futures and options exchanges often require traders to post initial margin when they enter into new contracts. Margin accounts are debited or credited to reflect changes in the current market prices on the positions held. Members must replenish the margin account if margin falls below a minimum.

Market risk: the risk of losses in on and off-balance-sheet positions arising from movements in market prices, including interest rates, exchange rates and equity values.

Marking-to-market: the process of revaluing a portfolio on the basis of prevailing market prices.

Observation period: the period over which it is judged appropriate to review historical data in setting a capital requirement. For example, the requirement might be set according to observed price changes over the past five years.

Off-balance-sheet activities: banks' business that does not generally involve booking assets or liabilities. Examples include trading in swaps, options, futures and foreign exchange forwards, and the granting of standby commitments and letters of credit.³³

. Option: the contractual right, but not the obligation, to buy or sell a specified amount of a given financial instrument at a fixed price before or at a designated future date. A call option confers on the holder the right to buy the financial instrument. A put option involves the right to sell the financial instrument.

33 In certain countries, some of these instruments may be on the balance sheet.

OTC (over-the-counter): trading in financial instruments transacted off organised exchanges. Generally the parties negotiate all details of the transactions, or agree to certain simplifying market conventions.

Out-of-the-money: an option contract is out of the money when there is no benefit to be derived from exercising the option immediately. A call option is out of the money when the price of the underlying is below the option's exercise price. A put option is out of the money when the price of the underlying is above the option's exercise price.

Repurchase agreement (RP or repo): a holder of securities sells securities to a counterparty with an agreement to repurchase them at a fixed price on a fixed date.

Settlement: the completion of a transaction, wherein the seller transfers securities or financial instruments to the buyer and the buyer transfers money to the seller.

Settlement risk: the risk that a counterparty to whom a firm has made a delivery of assets or money defaults before the amounts due or assets have been received; may also in certain contexts refer to the risk that technical difficulties interrupt delivery or settlement even if the counterparties are able to perform.

Short option position: the position of a trader who has sold or written an option. The writer's maximum potential profit is the premium received.

Simulation: a mathematical technique for measuring the likely performance of a given portfolio for changes in certain parameters such as market interest rates or foreign exchange rates.

Specific risk: the risk that the price of a given instrument will move out of line with similar instruments, due principally to factors related to its issuer.

Subordinated loans: debt issued by financial institutions which in liquidation is subordinated to claims by general creditors but which ranks above ordinary and preferred shares.

Swap: a financial transaction in which two counterparties agree to exchange streams of payments over time according to a predetermined rule.

Trading book: an institution's proprietary positions in financial instruments which are taken on with the intention of benefiting in the short term from actual or expected differences between their buying and selling prices or of hedging other elements of the trading book, or which are held for short-term resale, or in order to execute a trade with a customer.

Volatility: a measure of the variability of the price of an asset, usually defined as the annualised standard deviation of the natural log of asset prices.

- Warrant: tradeable instrument with the character of an option whose holder has the right to purchase from, or sell to, the warrant issuer a quantity of financial instruments under specified conditions for a specified period of time.
- Writer: the party that sells an option. The writer is required to carry out the terms of the option at the choice of the holder.
- Zero coupon bonds: securities which do not make periodic interest payments and are redeemed at face value at a specified maturity date. These securities are sold at a deep discount, and the return accrues to the buyer as the security gradually appreciates.

ANNEX 2

Debt securities: risk weights

The table below sets out the general risk weights which are proposed for the net open positions (long or short) in each time-band under the standard method described in paragraphs 13 to 19 of Section 2.

<u>Coupon 3% or more</u>	<u>Coupon less than 3%</u>	<u>Duration weight (A)</u>	<u>Assumed change in yields (B)</u>	<u>Risk weight (A) x (B)</u>
up to 1 mo.	up to 1 mo.	0.00	1.00	0.00%
1 to 3 mos	1 to 3 mos	0.20	1.00	0.20%
3 to 6 mos	3 to 6 mos	0.40	1.00	0.40%
6 to 12 mos	6 to 12 mos	0.70	1.00	0.70%
1 to 2 yrs	1.0 to 1.9 yrs	1.40	0.90	1.25%
2 to 3 yrs	1.9 to 2.8 yrs	2.20	0.80	1.75%
3 to 4 yrs	2.8 to 3.6 yrs	3.00	0.75	2.25%
4 to 5 yrs	3.6 to 4.3 yrs	3.65	0.75	2.75%
5 to 7 yrs	4.3 to 5.7 yrs	4.65	0.70	3.25%
7 to 10 yrs	5.7 to 7.3 yrs	5.80	0.65	3.75%
10 to 15 yrs	7.3 to 9.3 yrs	7.50	0.60	4.50%
15 to 20 yrs	9.3 to 10.6 yrs	8.75	0.60	5.25%
over 20 yrs	10.6 to 12 yrs	10.00	0.60	6.00%
	12 to 20 yrs	13.50	0.60	8.00%
	over 20 yrs	21.00	0.60	12.50%

For those who wish to apply the alternative method described in paragraphs 20 and 21 of Section 2, slightly different time-bands based on duration would apply:

<u>Zone 1</u>	<u>Zone 2</u>	<u>Zone 3</u>
up to 1 mo.	1.0 to 1.8 yrs	3.3 to 4.0 yrs
1 to 3 mos	1.8 to 2.6 yrs	4.0 to 5.2 yrs
3 to 6 mos	2.6 to 3.3 yrs	5.2 to 6.8 yrs
6 to 12 mos		6.8 to 8.6 yrs
		8.6 to 9.9 yrs
		9.9 to 11.3 yrs
		11.3 to 16.6 yrs
		over 16.6 yrs

ANNEX 3

Debt securities
Horizontal offsetting

The proposal groups time-bands into three zones as indicated below.

Partial offsetting would be permitted between weighted long and short positions in each zone, subject to the matched portion attracting a disallowance factor that is part of the capital charge. The disallowance proposed within zone 1 is 40%, applied to one side of the matched amount. Within zones 2 and 3 the disallowance would be 30%.

The remaining net position in each zone would be carried over and offset against opposite positions in other zones, where the process is repeated. The proposed disallowance factor between adjacent zones is 40%. The disallowance between non-adjacent zones would be 150%, meaning that 25% of a matched position would be regarded as hedged.

	<u>Time-band</u>	<u>within</u> <u>the zone</u>	<u>between</u> <u>adjacent zones</u>	<u>between</u> <u>zones 1 and 3</u>
Zone 1	0 - 1 mo.			
	1 - 3 mos	40%		
	3 - 6 mos			
	6 - 12 mos		40%	
Zone 2	1 - 2 yrs			
	2 - 3 yrs	30%		150%
	3 - 4 yrs			
	4 - 5 yrs		40%	
Zone 3	5 - 7 yrs			
	7 - 10 yrs			
	10 - 15 yrs	30%		
	15 - 20 yrs			
	over 20 yrs			

ANNEX 4

Debt securities
Sample market risk calculation

Time-band	Issuer	Position	Specific risk		General market risk	
			Weight (%)	Charge	Weight (%)	Charge
0- 1 mo.	Treasury	5,000	0.00	0.00	0.00	0.00
1- 3 mos	Treasury	5,000	0.00	0.00	0.20	10.00
3- 6 mos	Qual Corp	4,000	0.25	10.00	0.40	16.00
6-12 mos	Qual Corp	(7,500)	1.00	75.00	0.70	(52.50)
1- 2 yrs	Treasury	(2,500)	0.00	0.00	1.25	(31.25)
2- 3 yrs	Treasury	2,500	0.00	0.00	1.75	43.75
3- 4 yrs	Treasury	2,500	0.00	0.00	2.25	56.25
3- 4 yrs	Qual Corp	(2,000)	1.60	32.00	2.25	(45.00)
4- 5 yrs	Treasury	1,500	0.00	0.00	2.75	41.25
5- 7 yrs	Qual Corp	(1,000)	1.60	16.00	3.25	(32.50)
7-10 yrs	Treasury	(1,500)	0.00	0.00	3.75	(56.25)
10-15 yrs	Treasury	(1,500)	0.00	0.00	4.50	(67.50)
10-15 yrs	Non Qual	1,000	8.00	80.00	4.50	45.00
15-20 yrs	Treasury	1,500	0.00	0.00	5.25	78.75
> 20 yrs	Qual Corp	1,000	1.60	16.00	6.00	60.00
Specific risk				229.00		
Residual general market risk						66.00

Calculation of capital charge

1. Specific Risk Charge
229.00

2. Vertical offsets WITHIN SAME TIME-BANDS

<u>Time-band</u>	<u>Longs</u>	<u>Shorts</u>	<u>Residual*</u>	<u>Offset</u>	<u>Disallowance</u>	<u>Charge</u>
3-4 yrs	56.25	(45.00)	11.25	45.00	10.00%	4.50
10-15 yrs	45.00	(67.50)	(22.50)	45.00	10.00%	4.50

3. Horizontal offsets WITHIN SAME TIME-ZONES

	<u>Longs</u>	<u>Shorts</u>	<u>Residual*</u>	<u>Offset</u>	<u>Disallowance</u>	<u>Charge</u>
<u>Zone 1</u>						
0-1 mo.	0.00					
1-3 mos	10.00					
3-6 mos	16.00					
6-12 mos		(52.50)				
Total						
Zone 1	26.00	(52.50)	(26.50)	26.00	40.00%	10.40
<u>Zone 2</u>						
1-2 yrs		(31.25)				
2-3 yrs	43.75					
3-4 yrs	11.25					
Total						
Zone 2	55.00	(31.25)	23.75	31.25	30.00%	9.38

* Residual amount carried forward for additional offsetting as appropriate.

	<u>Longs</u>	<u>Shorts</u>	<u>Residual*</u>	<u>Offset</u>	<u>Disallowance</u>	<u>Charge</u>
<u>Zone 3</u>						
4-5 yrs	41.25					
5-7 yrs		(32.50)				
7-10 yrs		(56.25)				
10-15 yrs		(22.50)				
15-20 yrs	78.75					
> 20 yrs	60.00					
Total						
Zone 3	180.00	(111.25)	68.75	111.25	30.00%	33.38

4. Horizontal offsets BETWEEN TIME-ZONES

	<u>Longs</u>	<u>Shorts</u>	<u>Residual*</u>	<u>Offset</u>	<u>Disallowance</u>	<u>Charge</u>
Zone 1 &						
Zone 2	23.75	(26.50)	(2.75)	23.75	40.00%	9.50
Zone 1 &						
Zone 3	68.75	(2.75)	66.00	2.75	150.00%	4.12

5. Total capital charge

Specific risk	229.00
Vertical disallowances	9.00
Horizontal disallowances	
(offsets within same time-zones)	53.16
(offsets between time-zones)	13.62
Residual general market risk after all offsets	<u>66.00</u>
Total	370.78

* Residual amount carried forward for additional offsetting as appropriate.

ANNEX 5

Debt securities and equities
Alternative treatment for options

1. The Committee believes that there needs to be both a simplified approach for institutions which use purchased options largely to hedge other positions and a more sophisticated approach to be used by those who write options and the major players in the market.
2. It is proposed that institutions doing a limited amount and range of options business could use a simplified approach, as set out below, for particular trades.

Cash position	Option position	Treatment
Long	Long put	Position risk would be the market value of the underlying security multiplied by the sum of specific and general market risk charges for the underlying less the amount the option is in the money (if any) ³⁴
or		
Short	Long call	
None	Long call	Position risk would be the lesser of:
	or	(i) the market value of the underlying security multiplied by the sum of specific and general market risk charges for the underlying
	Long put	(ii) the market value of the option

3. The more sophisticated approach for use by institutions involved in more complex strategies than those set out above would give

34 For example, 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: $1,000 \times 16\%$ (e.g. 8% specific plus 8% general market risk) = \$160, less the amount the option is in the money $(\$11 - \$10) \times 100 = \$100$, i.e. the capital charge would be \$60.

allowance for options-hedging for a variety of different trading book instruments. Comments from market participants would be especially welcome on how this can be done in a manner which is both sufficiently accurate and acceptable to supervisors and market participants for the purposes of minimum international standards. Two possible methods are being considered.

4. In the first of these, described in paragraph 29 of Section II and paragraph 16 of Section III, options positions would be delta weighted to convert them into positions in the underlying, which would then be treated as normal positions in the basic building-block approach. However, because this would neglect the gamma and volatility risk it is proposed that there should be an additional capital charge. One possibility would be to have a fixed add-on for open options positions and/or higher disallowances than assumed in the building-block methodology for hedged positions, for example a 60% disallowance. However, consideration would be given to alternative proposals from the industry.

5. In the second approach, approved options pricing models could be used to calculate the risks in options positions and related positions in the underlying or other derivatives, according to parameters set by the regulators. For example, these parameters would be designed to cover interest rate changes up to 1% at the short end and 0.6% at the long end (in line with the scale set out in Column B of Annex 2) and changes in implied volatility of +/- 25% from the current level. This approach would not be consistent with the building-block methodology and would mean institutions having discretion to "carve out" positions from the framework.

6. Currently, for measuring the overall market risk in exchange-traded options,³⁵ some securities regulators set the capital requirement at a level equal to the margin set by exchange in circumstances where the supervisor is fully satisfied that this accurately reflects the risk. On most exchanges participants are required to put up initial or original margin (typically in the range 5% to 10% of the contract price) plus any

35 The same would also apply to exchange-traded futures

variation margin which results from marking to market the firm's position daily. The margin requirements are explicitly based on price risk measured according to historic volatility and are reassessed daily or sometimes more frequently with a view to covering expected market exposure over the subsequent trading day.

7. The Committee has concerns about tying a capital standard intended for prudential purposes to margin requirements designed to protect exchanges from member defaults. It notes that this would not ensure equal treatment and could lead to pressure on exchanges to soften their margining rules. It also wonders what effects might result from using different systems for OTC and exchange-traded products, and from applying different capital charges to different exchanges. Finally, some Committee members are concerned about the systemic effects if capital requirements are free to rise sharply in periods of high market volatility, expressing a strong preference for setting capital at a level which is considered adequate for all market situations.

ANNEX 6

Summary of proposed treatment of interest rate derivatives

<u>Instrument</u>	<u>Specific risk charge</u>	<u>General market risk charge</u>	<u>Possible alternative treatments</u>
Exchange-traded future			
- Government security	No	Yes, as two positions ³⁶	Margin set by exchange
- Corporate debt security	Yes	Yes, as two positions ³⁶	Margin set by exchange
- Index on short-term interest rates (e.g. LIBOR)	No	Yes, as two positions ³⁶	Margin set by exchange
OTC forward			
- Government security	No	Yes, as two positions ³⁶	
- Corporate debt security	Yes	Yes, as two positions ³⁶	
- Index on short-term interest rates	No	Yes, as two positions ³⁶	
FRAs	No	Yes, as two positions ³⁶	
Swaps	None	Yes, as two positions	Sensitivity models

36 Or as a single position in the underlying.

<u>Instrument</u>	<u>Specific risk charge</u>	<u>General market risk charge</u>	<u>Possible alternative treatments</u>
Exchange-traded option			
- Government security	No	Yes	Either (a) Simple strategy requiring carve-out of purchased options and their hedges
- Corporate debt security	Yes	Yes	(b) The use of options pricing models to be applied to the whole options book and associated positions
- Index on short-term interest rates	No	Yes	(c) Margin set by exchange
OTC options			
- Government security	No	Yes	Either
- Corporate debt security	Yes	Yes	(a) Simple strategy requiring carve-out of purchased options and their hedges
- Index on short-term interest rates	No	Yes	(b) The use of options pricing models to be applied to the whole options book and associated positions

ANNEX 7

Equities

Illustration of x plus y methodology

Under the proposed two-part calculation described in Section 3 there would be separate requirements for the position in each individual equity (i.e. the gross position) and for the net position in the market as a whole. The table below illustrates how the system would work for a range of hypothetical portfolios, assuming a capital charge of 4% for the gross positions and 8% for the net positions.

<u>Sum of</u> <u>long</u> <u>positions</u>	<u>Sum of</u> <u>short</u> <u>positions</u>	<u>Gross</u> <u>position</u> <u>(sum of</u> <u>cols 1 & 2)</u>	<u>4% of</u> <u>gross</u>	<u>Net</u> <u>position</u> <u>(Difference</u> <u>between</u> <u>cols 1 & 2)</u>	<u>8% of</u> <u>net</u>	<u>Capital</u> <u>required</u> <u>(gross +</u> <u>net)</u>
100	0	100	4	100	8	12
100	25	125	5	75	6	11
100	50	150	6	50	4	10
100	75	175	7	25	2	9
100	100	200	8	0	0	8
75	100	175	7	25	2	9
50	100	150	6	50	4	10
25	100	125	5	75	6	11
0	100	100	4	100	8	12

ANNEX 8

Summary of proposed treatment of equity derivatives

<u>Instrument</u>	<u>Specific risk(x)</u>	<u>General market risk (y)</u>	<u>Possible alternative treatments</u>
Exchange-traded future			
- Individual equity	Yes	Yes, as underlying	Margin set by exchange
- Index	2%	Yes, as underlying	Margin set by exchange
OTC forward			
- Individual equity	Yes	Yes, as underlying	
- Index	2%	Yes, as underlying	
Exchange-traded option			
- Individual equity	Yes	Yes	Either
- Index	2%	Yes	(a) Simple strategy requiring carve-out of purchased options and their hedges (b) The use of options pricing models to be applied to the whole options book and associated positions (c) Margin set by exchange
OTC option			
- Individual equity	Yes	Yes	Either
- Index	2%	Yes	(a) Simple strategy requiring carve-out of purchased options and their hedges (b) The use of options pricing models to be applied to the whole options book and associated positions

ANNEX 9

Example of the shorthand measure of foreign exchange risk

Once a bank has calculated its net position in each foreign currency, it would convert each position into its reporting currency and calculate the shorthand measure as in the following example, in which the position in the reporting currency has been excluded:

<u>YEN</u>	<u>DM</u>	<u>GB£</u>	<u>FFR</u>	<u>US\$</u>	<u>GOLD</u>	<u>PLATINUM</u>
+ 50	+ 100	+ 150	- 20	- 180	- 30	+ 5
<hr/>			<hr/>		<hr/>	
+ 300			- 200		35	

The capital charge would be 8% of the higher of the longs and shorts (i.e. 300) plus gross positions in precious metals (35) = $335 \times 8\% = 26.8$