The Measurement and Assessment of Market Risk: a Comparison of the European Commission and Basle Committe Approaches

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Introduction

Ever since its success, in July 1988, in securing agreement on the prescription of minimum capital charges to cover the credit risks of "internationally-active" banks (Hall 1987) the Basle Committee of Supervisors – a body comprising the central bank governors of the Group of Ten (G10) countries – has been working on ways of widening the agreement (henceforth termed the "accord") to take account of banks' market risks. Such activity reflected concerns with developments, such as the deregulation of interest rates, the dismantling of capital controls, the relaxation of constraints on banks' permitted range of activities, the erosion of the traditional distinction between "banks" and "securities firms" and the rapid growth in banks' trading in derivatives, foreign exchange and securities, which had both allowed for and led to a dramatic increase in the market risks faced by banks, risks which were not captured by the credit risk-based assessment methodology of the accord. The outcome of this work was the publication in April 1993 (Basle Committee 1993a), of consultative proposals for the measurement and assessment of the market risks facing banks and for the extension of capital requirements to cover banks' open positions in debt and equity securities (including their derivatives) in "trading" portfolios and in foreign

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exchange. A revised version of this document, accommodating the banking industry's reactions to the initial proposals, was issued in April 1995 (Basle Committee 1995). The consultation period for this document lasts until the end of July 1995, with a definitive statement planned for end-1995. It is envisaged that the final set of agreed proposals should be implemented by all G10 nations by the end of 1997 at the latest. As far as banks' trading books are concerned, the new risk-based requirements would substitute for the existing credit risk requirements, the overall impact on a bank's total capital requirement depending on its risk profile.[1]

Side by side with the deliberations taking place within the Basle Committee, discussions were also taking place within two alternative fora – the European Commission (EC) and the International Organisation of Securities Commissions (IOSCO), the latter body comprising securities regulators from the leading financial centres. While members of IOSCO have, to date, found it impossible to reach an "agreed position" on the form and size of capital requirements to be applied to the market risks faced by securities firms, the EC has, by way of contrast, in its desire to complete the "Internal Market" in financial services, produced proposals – contained in the "Capital Adequacy Directive" (the CAD) – which were formally adopted by Member States in 1993. This will mean that, by the end of December 1995 at the latest, a substantial degree of convergence across the two financial sectors – banking and securities – will have been secured in the European Union (EU), as the CAD's (minimum) capital charges for market risks apply to both credit institutions and investment firms authorised in the EU.

Given the close contact maintained between the EC and the Basle Committee, it is hardly surprising that their approaches closely resemble each other in many respects. However, significant differences remain, differences which, if not ironed out, will fundamentally affect both the stability of the international financial system and the competitiveness of the different players in the market place. Accordingly, the differences are subjected to close scrutiny in this article.

[1] Wider recognition of "netting" arrangements might also play a part (see Basle Committee 1993b), although there are currently no proposals to require "add ons" for exposure to interest rate risk (Basle Committee 1993c).

The European approach

Like its counterpart "Banking Directive", the "Second Banking Coordination Directive" (SBCD) (89/646/EEC) – which, together with the "Own Funds Directive" (OFD) (89/299/EEC) and the "Solvency Ratio Directive" (SRD) (89/647/EEC), established the conditions on which a credit institution authorised in one European Member State may establish a branch in, or otherwise provide a range of "banking" services into, another Member State on the strength of its home country authorisation (the so-called "single passport" principle) –, the CAD (93/6/EEC) together with the "Investment Services Directive" (ISD) (93/22/EEC) establish the terms on which an intermediary (bank or investment – i.e. securities – firm) can avail itself of the "investment business"[2] single passport. Accordingly, it is concerned not only with the promulgation of (minimum) market risk-based capital requirements but also with minimum *initial* capital requirements, at least in respect of investment firms. [3]

Initial capital requirements

Under the CAD, EU investment firms must observe minimum initial (and continuing) capital requirements which range from ECU 50,000 to ECU 730,000 depending on the nature of the investment business undertaken.[4] These requirements must be implemented in

[2] The "investment services" covered by this passport are set out in the ISD. It should be noted, however, that there is some overlap between these and the "banking" services covered by the passport available under the SBCD. Banks which confine their investment business activities to those covered by the SBCD do not need to obtain the investment business passport to enable them to offer such services cross border within the EU.

[3] Minimum initial capital requirements applicable to banks are contained in the SBCD.

[4] For those investment firms which fall foul of the initial capital requirements [exempted firms comprise those entities which are exempt from the provisions of the CAD altogether – i.e. firms which provide investment services exclusively for other group companies, pension fund managers, UCITs, commodities traders, central banks of Member States, insurance companies and firms which provide investment services in a manner incidental to their main professional activities – plus "locals" and "order takers" (see note 6) which do not benefit from the single passport or other opportunities (such as access to other Member States' clearing and settlement systems and regulated markets) offered by the ISD] the minimum capital requirement is either ECU 50,000, ECU

respect of newly-authorised[5] investment firms by the end of 1995 at the latest.

Market risk-based capital requirements

Both EU banks and investment firms (unless exempt)[6] are subject to the risk-based requirements imposed by the CAD, which take effect from the end of 1995. For both types of intermediary, this involves summing the CAD's capital requirements for dealing with: (i) position risk, settlement risk, counterparty risk and large exposures risk arising from their "trading-book"[7] activities, in accordance with Annexes I, II and VI of the CAD (see Annexes A to D of this article for a summary of the assessment methodologies employed);[8] (ii) the foreign exchange risk arising from all their business activities, in accordance with Annex III of the CAD (see Annex E for a summary); (iii) the risks arising in connection with business that is outside the scope of both the CAD and the SRD and which are similar to the risks covered by these directives ("adequate" own funds have to be held to cover these risks); and (iv) the risks arising from their non-trading book business (handled by applying the SRD's provisions to this business).[9]

In this way, a degree of equality of treatment ("regulatory neutrality") between banks and securities houses is secured although the amount of discretion residing with national regulators militates against this, as does the earlier availability of the "banking" single passport, which extends to the provision of some investment services (see note 2).

125,000 or ECU 730,000. The ECU 125,000 figure applies to those investment firms which hold clients' money and/or securities and which offer one or more of the following services: "the reception and transmission of investors' orders for financial instruments; the execution of investors' orders for financial instruments, and the management of individual portfolios of investments in financial instruments" [Article 3(1)]. These arrangements, however, are subject to the proviso that the investment firms "do not deal in any financial instruments for their own account or underwrite issues or financial instruments on a firm commitment basis". At the discretion of Member States, this amount may be reduced to ECU 50,000 for investment firms which are not authorised to hold clients' money nor securities, nor to deal for their own account, nor to underwrite issues on a firm commitment basis. "Locals" and "order takers" which do benefit from the opportunities afforded by the ISD are also subject to the lower figure of ECU 50,000. All other investment firms must satisfy a minimum capital requirement of ECU 730,000. Only paid-up share capital (or its equivalent for partnerships) retained earnings and audited profits may be used to satisfy these requirements.

[5] Member States are allowed to continue to authorise investment firms in existence before the Directive is implemented whose own funds are less than the amounts specified under the CAD's initial capital requirements provided that their own funds do not fall below the highest "reference level" [see Article 3(5)] calculated after the date of notification of the CAD.

[6] i.e. local firms ("locals") – those dealing on financial futures or options exchanges either solely on an own-account basis or dealing for other members of the exchanges in question and guaranteed by a clearing member of such an exchange – plus firms acting merely as order takers without holding their clients' money or securities ("order takers").

[7] The "trading book" of an institution is defined in Article 2(6) of the CAD and comprises:

(i) proprietary positions in financial instruments held for resale and/or with a view to benefiting from short-term variations in price or interest rates;

(ii) positions in financial instruments arising from matched principal broking;

(iii) positions taken in order to hedge other elements of the trading book;

(iv) exposures arising from unsettled transactions in debt securities and equities, from securities paid for but not yet received ("free deliveries"), and from over-the-counter derivatives such as swaps and options;

(v) exposures arising from repurchase agreements and securities lending which are based on securities included in the trading book;

(vi) exposures due to reverse repurchase agreements and securities borrowing transactions, provided the regulatory authorities approve; and

(vii) exposures arising from services provided by the firm, in the form of fees, commission, interest, dividends and margins on exchange-traded products which relate directly to items in the trading book.

To avoid their unjustified inclusion in the trading book, which could lead to application of lighter capital requirements, the CAD requires, however, that their inclusion be based on "objective procedures", the terms and implementation of which should be reviewed by the regulatory authorities. Moreover, exposures of type (vi) are only eligible for inclusion in the trading-book if: (a) the exposures are marked to market on a daily basis; (b) the collateral is adjusted in a manner acceptable to the regulatory authorities to take account of material changes in the value of the underlying securities; (c) the agreement or transaction provides automatic "set-off" in the event of default by the counterparty; and (d) such agreements and transactions are confined to their "accepted and appropriate use" and additional transactions, especially those not of a short-term nature, are excluded. [Conditions (a) to (c) may be waived if the agreement or transaction in question is an inter-professional one.]

[8] Note that the loan books of banks are also subject to the limits and restrictions imposed under the "Large Exposures Directive" (LED) (92/121/EEC). The CAD's treatment of exposures relating to the trading book will replace the provisions of the LED hitherto applied to credit institutions for such purposes.

[9] "Illiquid assets" (as defined in Annex V, para. 8, of the CAD) may be deducted before the application of the SRD's provisions if a firm is using the alternative definition of capital – see Annex G – in meeting its trading-book capital requirements and, in calculating its regulatory capital, deducts such illiquid assets from own funds.

Minimum capital requirements

For EU *banks* the minimum capital requirement which has to be observed is the higher of: (i) the minimum initial capital requirement specified in the SBCD; and (ii) the sum of the minimum risk-based capital requirements deriving from the application of the CAD. (As explained above, this incorporates the application of the SRD to the banking book and the CAD's market risk requirements to the trading book, with "add ons" to account for foreign exchange risk and risks arising from business outside the scope of the CAD and the SRD.)

For EU *investment firms* subject to the CAD, the minimum capital requirement is the greater of: (i) the minimum initial capital requirement imposed under the CAD; (ii) the risk-based own funds requirement deriving from the application of the CAD; and (iii) one quarter of the firm's fixed overheads in the previous year (or one quarter of the projected figure for fixed overheads for start up firms). (The last requirement is imposed under the CAD to account for the "other" risks to which firms are exposed.)

The definition of capital

The capital items which may count towards meeting the risk-based capital requirements imposed by the CAD are the same as those which were eligible for inclusion within the "capital base" under the SRD (i.e. the "original" and "additional" own funds elements identified within the OFD – see Annex F). However, national regulators are empowered to permit intermediaries (*both* investment firms and banks) to adopt an alternative definition of capital – see Annex G – but only in respect of satisfying the CAD's risk-based capital requirements arising from *trading-book* activities (i.e. to cover the risks set out in Annexes I, II, III, IV and VI of the CAD). Accordingly, the risks arising from investment firms' non-trading book activities, like banks' lending activities, have to be covered by capital of the form permitted under the OFD. The concession of allowing (an albeit limited amount of) short term subordinated loan capital to count towards regulatory capital for the purpose of satisfying the CAD's market risk-related requirements remains, however, a source of controversy for those (banking) regulators wedded to the idea that regulatory capital has to be "permanent".

The Basle Committee's approach

In developing a framework for integrating market risk-based capital requirements into the accord, the Basle Committee was guided by a number of considerations. Firstly, it was determined to design proposals that would ultimately apply to institutions (i.e. securities firms) beyond its immediate sphere of influence, namely internationally-active banks. Thus, although eager to secure the support of banking regulators, it was willing to run the risk of upsetting some in the interests of securing a degree of harmonisation between the approaches adopted by banking and securities regulators.

Secondly, in developing its approach, it was seeking to satisfy two principal objectives: to promulgate capital requirements that would constitute *minimum* prudential standards for regulators to adopt; and to establish a set of capital charges to cover the market risks[10] arising from position-taking in debts, equities, commodities (including their derivatives) and foreign exchange that would not artificially distort the use of one class of instrument.

Thirdly, the minimum capital charges suggested for debt and equities (and their derivatives) would only apply to trading book positions, expressed in market value terms, where trading positions were defined as:

> "the banks' proprietary positions in financial instruments [including positions in derivative products and interest rate 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" (Basle Committee 1993a, p. 6, para. 8; a similar definition is provided in Basle Committee 1995, at p. 1, para. 2).

Inclusion or exclusion of items from the trading book should also be in accordance with the adoption of "objective procedures", such procedures and their implementation being subject to regulatory review for legitimacy and consistency. The proposed capital charges

[10] Neither counterparty risk nor settlement risk are addressed by the Committee although, as noted earlier, the counterparty risk arising from activities in some over-the-counter derivatives are already captured under the accord (see Hall 1987).

for foreign exchange and commodities risk would, in contrast, be applied to *all* the business activities undertaken by an intermediary, some of which are likely to be in book value terms.

Fourthly, the Committee was concerned that the capital charges, to be applied on a worldwide consolidated basis, be statistically valid and objectively determined and, accordingly, subjected them to the test 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" (Basle Committee 1993a, p. 5, para. 4).

Fifthly, the Committee favoured capital requirements over limits as the appropriate means through which harmonisation of the treatment of market risk should be secured because the former enable bank managements to retain flexibility in managing such risks, while encouraging risk management activities (e.g. hedging and risk-based capital allocation) designed to improve capital allocation and the risk-adjusted rates of return on the overall portfolio.[11] Notwithstanding this, however, national supervisors are encouraged to maintain limits where they judge it appropriate to do so, perhaps as a means of capping banks' exposures or of reinforcing internal controls.

Sixthly, as materialised in the CAD, the Committee continued to promote the use of the "building block" approach to risk assessment by splitting total position risk arising from exposures in debt and equities into "specific" and "general risk" components because it believed "it provides a sound conceptual and practical basis for permitting offsetting of matched (i.e. long and short) positions". While such an approach undoubtedly facilitates such offsetting activities, it is less clear, however, that it is soundly based (see Dimson and Marsh 1994) a criticism taken on board in its revised proposals (see below).

Finally, the Committee was concerned to consult as widely as possible with market practitioners before finalising its plans. A consultation period, lasting from the date of publication of the proposals – April 1993 – until end-December 1993 was duly established for the original set of proposals, with a somewhat shorter time period (i.e. three and a half months) applicable to the revised proposals.

As for the implications of implementation of the new proposals for the capital accord, it is worth emphasising that, in the case of debt

[11] There is a danger, however, that, as for the accord, perverse outcomes, involving potentially destabilising risk assumption, may result (see Hall 1994).

securities and equities held in the trading book, the proposed market risk capital charges would *substitute* for the credit risk weighted requirements currently applied to balance sheet assets. Items not falling within the trading book (e.g. derivative products taken on to hedge positions in the banking book, the loan book and the investment book) would, however, continue to be subject to the credit risk-based requirements of the accord. If national regulators sanction the inclusion of short term subordinated debt within regulatory capital – see below – this can only be used to meet the market risk-based capital charges discussed below (i.e. it cannot be used to meet credit or counterparty risk, including that arising in respect of derivatives in either the trading or banking books).

Changes introduced under the revised proposals

The Committee's revised proposals were designed, *inter alia*, to address some of the comments and criticisms received during the first consultation period. In particular, the Committee was responding to the criticisms that: (i) the initial proposals did not recognise best market practice in risk measurement techniques and thus failed to provide a sufficiently strong incentive for institutions to improve risk management systems; (ii) the proposed risk assessment methodology failed to take account of correlations and portfolio effects across instruments and markets, and generally did not sufficiently reward risk diversification; and (iii) the initial proposals were not sufficiently compatible with banks own, often far more sophisticated, measurement systems, implying unnecessarily high compliance costs.

The use of in-house models. Eager to encourage the development of sound management practices and to minimise the creation of perverse incentives, the Committee duly set about investigating the possibility of allowing banks to use their own proprietary internal models, often termed "value-at-risk" models, to generate capital charges to handle their exposures to market risk as an alternative to adopting the (slightly amended) standardised measurement framework originally proposed. (Such a development had, indeed, been foreshadowed in the Committee's original sanctioning of the use of simulation techniques to generate capital charges to cover foreign exchange risk.) To balance the need to preserve the integrity and

flexibility of banks' internal models against the need to ensure the transparency and consistency of capital requirements across banks, however, the Committee decided, after conducting a series of tests with the industry during the second half of 1994, to sanction such a development (still subject to national discretion) provided that six sets of conditions were met. These conditions relate to the following: (i) general criteria concerning the adequacy of the risk management system; (ii) qualitative standards for internal oversight of the use of the models, notably by management; (iii) guidelines for specifying an appropriate set of market risk factors (i.e. the market rates and prices which affect the value of banks' positions); (iv) quantitative standards setting out the use of common minimum statistical parameters for measuring risk; (v) validation procedures for external oversight of the use of models; and (vi) rules for banks which use a mixture of models and the standardised approach. Given the significance of this supervisory development, it is worthwhile elaborating on some of these conditions further (for full details see Part B, Sections B.1 to B.6 of the Basle Committee's "Planned supplement to the capital accord to incorporate market risks", itself a part of the Basle Committee's April 1995 document).

Under the *general criteria*, a supervisory authority has to be satisfied with at least the following aspects of a bank's operations before granting approval for the use of internal models to generate market risk capital charges: its risk management system; the number of skilled staff employed in the trading, risk control and audit areas and, if necessary, also in back office areas; the track record of the models in predicting losses with reasonable accuracy; and its conduct in the area of "stress testing".

To meet *qualitative criteria* which banks have to satisfy before being allowed to employ a models-based approach to generating market risk capital requirements, a bank is required to do the following: operate an independent risk control unit, ensuring the active involvement of senior management in the process; ensure that the model is closely integrated into day-to-day risk management and that a routine and rigorous programme of "stress testing" is in place; adopt a routine for ensuring compliance; ensure that an independent review of both risk management and risk measurement procedures is carried out at regular intervals; prescribe procedures for internal (involving the use of "back testing") and external validation of the risk measurement process. In summary, the qualitative standards are designed to

ensure that banks' management systems are conceptionally sound and that the process of managing market risks is carried out with integrity. In this context, it is also thought necessary to define the risks that need to be covered, to establish appropriate guidelines for the conduct of stress tests (for further details see Section V of "An internal model-based approach to market risk capital requirements", part of the Basle Committee's April 1995 document) and to provide guidance on validation procedures for examiners and auditors charged with independently reviewing and validating banks' internal models (for further details see Part B, section B.5 of the Basle Committee's "Planned supplement to the capital accord", *op. cit.*, 1995).

The *quantitative standards*, which are designed to address supervisors' prudential concerns and to ensure that the dispersion between the results of different models for a uniform set of positions are confined to a relatively narrow range, are expressed as a number of broad risk measurement parameters for banks' internal models, together with a simple rule for converting the models-based measure of exposure into a supervisory capital requirement. Accordingly, the "value-at-risk" has to be computed daily using a 99th percentile, one-tailed confidence interval and a minimum holding period of ten working days (i.e. 2 weeks). The historical observation period is subject to a minimum length of one year, although the Committee is investigating the possibility of a dual observation period. Banks will have discretion to recognise empirical correlations *within* broad risk categories (e.g. interest rates, exchange rates, equity prices, etc.), but value-at-risk *across* these risk categories has to be aggregated on a simple sum basis. Models must also accurately capture the unique risks associated with options. At a minimum this means that banks' internal risk measurement systems should incorporate option price behaviour through a non-linear approximation approach involving higher-order risk factor sensitivities.

The capital charge is to be computed as the higher of: the previous day's "value-at-risk" calculated according to the established parameters; and an average of the daily "value-at-risk" on each of the preceding sixty business days, multiplied by a "multiplication factor" to account for extreme market conditions. This factor is to be set by the national supervisor on the basis of their assessment of the quality of each bank's risk management system, subject to an absolute minimum of three. It will, however, at least for the time being, also

be subject to a "plus" which is directly related to the *ex post* performance of the model. This is designed to provide banks with a positive incentive to raise or keep high the predictive quality of the model as a plus of zero might apply where the *ex post* performance is excellent.

Finally, banks using internal models – no particular type of model is prescribed, the only requirement being that they capture all the material risks run by the bank – will be subject to a separate capital charge to cover the *specific risk* of traded debt and equity securities to the extent that this risk is not incorporated into their models. In such circumstances, however, the total specific risk charge applied to debt or equity securities should in no case be less than half the specific risk charges calculated according to the standardised methodology.

In establishing a set of guidelines for the specification of an appropriate set of *market risk factors*, the Committee is trying to ensure that the risk factors contained in a bank's market risk measurement system are sufficient to capture the risks inherent in the bank's portfolio of on- and off-balance sheet trading positions. Although banks will retain some discretion in this area, the guidelines have to be fulfilled. For *interest rates*, this involves specifying a set of risk factors which corresponds to interest rates in each currency in which the bank has interest rate sensitive on- or off-balance sheet positions. Additionally, the risk measurement system should model the yield curve using one of a number of generally accepted approaches, dividing the yield curve into various maturity segments in order to capture variation in the volatility of rates along the yield curve. For material exposures to interest rate movements in the major currencies and markets, banks must model the yield curve using a minimum of six risk factors (typically one for each maturity segment of the yield curve). Ultimately, however, the number of risk factors used should be determined by the nature of the bank's trading strategies. The risk measurement system must also incorporate separate risk factors to capture spread risk (e.g. between bonds and swaps), with the sophistication of approach being a function of the nature and scope of the bank's exposure to interest rates.

For *exchange rates*, the risk measurement system should incorporate risk factors corresponding to the individual foreign currencies in which the bank's positions are denominated.

For *equity prices*, there should be risk factors corresponding to each of the equity markets in which the bank holds significant positions. At a minimum, there should be a risk factor that is designed to capture market-wide movements in equity prices (e.g. a market index), while the sophistication and nature of the modelling technique employed in respect of a given market should correspond to the bank's exposure to the overall market as well as its concentration in individual equity issues in that market.

Similarly, for *commodity prices*, there should be risk factors corresponding to each of the commodity markets in which the bank holds significant positions, with the sophistication of the modelling techniques employed being linked to the size of positions run and scale of trading activity engaged in.

Finally, when handling the volatilities related to *options positions*, where the risks are particularly complex, the relevant quantitative standards outlined above have to be adhered to.

The final set of conditions, concerning the rules governing the *mixed use of internal models and standardised approaches*, is designed to cover the period during which banks which use models extend them to cover all their market risks. The Committee is keen to ensure that banks which start to use models for one or more risk factor categories will eventually – no time limit has been set – extend the models to all their market risks. Accordingly, a bank which has developed one or more models will not be able to revert to measuring the risk measured by those models according to the standardised methodology (unless the supervisor withdraws approval for that model). For those using combinations during this "transitional phase" the following conditions apply: (i) each broad risk factor category must be assessed using a single approach (either internal models or the standardised approach); (ii) the models used must comply with the six sets of conditions described above; (iii) banks may not modify the combination of the two approaches they use without supervisory consent; (iv) all market risk exposures must be captured; and (v) the capital charges assessed under the two approaches are to be aggregated according to the simple sum method.

Changes made to the standardised measurement method. The two main changes made to the original proposals concern the introduction of a separate framework for measuring *commodities risk* (see Annex H) and amended proposals for the treatment of *options* (for full details see Section A.5 of Part A of the Basle Committee's "Planned supplement to the capital accord to incorporate market risks", *op. cit.*,

1995). Under the original proposals, the Committee envisaged banks being allowed, at national discretion, a choice of two or more methods for the treatment of options, some of which would be incompatible with the espoused building-block methodology (see Basle Committee 1993a, Annex 5). In its revised proposals, the Committee suggests that banks, again subject to national discretion, be allowed to choose from a number – three are described in its document – of different alternatives within the standardised methodology, although banks which use significant trades in options will be expected over time to move to a comprehensive options risk management model and thus become subject to the relevant restrictions associated with the use of in-house models, as outlined earlier. Generally, supervisors are expected to apply the principle that the greater a bank's involvement in writing options, the more sophisticated its measurement method should be.

Other, fairly minor, changes made to the proposed standardised measurement method involve: the movement of the provisions governing the use of *comprehensive risk factor models for foreign exchange* (referred to as the "simulation method" in the original proposals) to the models section, to ensure that all banks using comprehensive models will be subject to the same qualitative and quantitative standards; and, in order to improve accuracy in the measurement of general market risk for traded debt securities, those employing the so-called "duration" method will now have "vertical disallowances" of half the size of the "maturity" method (see below).

Finally, if banks, subject to local supervisory approval, use the "duration-based" method for calculating capital charges to cover the general market risk on debt securities – see below – they no longer have to ensure that the capital charges so generated are "broadly equivalent" with the results produced using the standard "maturity" method. In taking this line, which is now also adopted in respect of the use of internal models to generate capital charges to cover foreign exchange risk, the Committee is further demonstrating its willingness to recognise and encourage the use of sophisticated risk assessment techniques, bringing it more in line with the European approach adopted under the CAD.

Other changes. As noted earlier, "Tier 3" capital can now be used to satisfy all market risk requirements, including those relating to foreign exchange and commodities exposures. In the original proposals, the use of Tier 3 capital to satisfy foreign exchange capital

charges (a commodities charge was not, at that time, contemplated) was explicitly ruled out.

Secondly, and sticking with the use of Tier 3 capital, the new "lock in" clause preventing payment of interest and principal is less severe than the original as it becomes operative when such payment would reduce a bank's overall capital to an amount less than its minimum risk based capital requirement rather than the original threshold specified of 20% above required capital.

The definition of capital

In meeting its market risk-based capital requirements, a bank must use the definition of capital currently employed within the accord unless its supervisors allow the inclusion of short term subordinated debt ("Tier 3" capital). If the latter is the case, the new form of subordinated debt can only be used in satisfaction of the market risk-based requirements, including those relating to foreign exchange and commodities risk, and cannot be used to satisfy the capital requirements levied against the "banking" book. Moreover, its inclusion is subject to a number of limitations and restrictions.[12]

Firstly, to be eligible for inclusion, the subordinated debt must satisfy the following:[13]

(i) it must be unsecured, subordinated and fully paid up;

(ii) it must have an original maturity of at least two years;

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[12] Apart from the limitations and restrictions applying to the use of such subordinated debt explained in the text below, the Committee also considered retaining the current rule in the accord that "Tier 1" capital (see Hall 1987), comprising the highest quality components of capital, must account for at least half of the capital base. This would mean that the sum of "Tier 2" and "Tier 3" (the newly authorised type) capital would be restricted to the size of a bank's holdings of Tier 1 capital. In its proposals of April 1995, however, it decided to leave the application of such a rule to national discretion. The rules limiting eligible Tier 2 capital to a maximum of 100% of aggregate Tier 1 capital, and long term subordinated debt to 50% of aggregate Tier 1 capital remain, however.

[13] These conditions are designed to ensure that, if circumstances demand, such instruments are capable of becoming part of an institution's permanent capital, and thus would be available to absorb losses. As Dale (1994) has pointed out, however, the "lock in" clause preventing repayment of principal and interest is never likely to be activated because it would be tantamount to defaulting, a perilous course of action for any (deposit taking) intermediary to take.

(iii) it may not be repayable before the agreed repayment date without the agreement of the supervisors;

(iv) it must 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 banks' overall capital would then amount to less than its minimum capital requirement.

And, secondly, the following limitations would apply to its use:

(i) it would be limited, in aggregate, to 250% of the Tier 1 capital allocated to support market risks; and

(ii) Tier 2 capital can be substituted for Tier 3 capital up to the same limit of 250% as long as the overall limits in the accord are not breached (i.e. aggregate Tier 2 capital does not exceed total Tier 1 capital, and long-term subordinated debt does not exceed 50% of Tier 1 capital).

Overall minimum capital requirement

The combination of the capital accord of 1988 and the new market risk-based requirements will mean banks will have to satisfy the following overall minimum capital requirement:

(i) the credit risk requirements arising from application of the current accord's provisions to the "banking" book (i.e. excluding debt and equity securities in the trading book and all positions in commodities, but including the credit counterparty risk on all over-the-counter derivatives whether in the trading or banking books);

plus

(ii) the capital charge for market risks arising from the application of the market risk-based requirements.

The latter is derived *either* by summing the individual capital charges for market risks derived by applying the "standardised measurement methods" *or* by using the figures deriving from the use of internal models (as explained below) *or* by using a mixture of the two, summed arithmetically.

This overall minimum capital requirement has to be met on a continuous basis, that is at the end of each business day, and banks are expected to ensure that intra-day exposures are not "excessive". Supervisors, in turn, are asked to ensure that banks do not "window dress" on reporting dates.

Calculation of the capital ratio

To ensure consistency in the calculation of capital requirements to cover both credit and market risks, the risk asset ratio methodology adopted in the original accord (see Hall 1987) must be adapted to accommodate market risk. This is to be done by expressing the new capital ratio as the ratio of 'eligible capital' [i.e. the sum of a bank's aggregate Tier 1 capital plus eligible Tier 2 capital, subject to the limitations and restrictions applied under the original accord, plus (subject to national discretion) eligible Tier 3 capital used to meet market risk requirements, subject to the limitations and restrictions noted above] to the sum of risk-weighted assets compiled for credit risk purposes and the market risk capital charge multiplied by 12.5 (the reciprocal of the 8% minimum ratio). (The latter transformation gives a figure for notional risk weighted assets on the trading book.)

Market risk-based capital requirements under the standardised measurement methods

1. *For equities*

The Basle Committee's proposals for a minimum capital standard to cover the position risk arising from equities trading,[14] which might be modified in the light of further discussions with securities regulators, embrace the building block approach adopted in the

[14] The treatment proposed would apply to equities and all instruments which exhibit market behaviour similar to equities, including equity warrants, convertibles, options on equities, commitments and other rights to buy or sell equity securities, derivative products, equity indices and index arbitrage. Non-convertible preference shares, however, are excluded and subject to the debt securities requirements – see the text.

CAD. Accordingly, the overall capital charge is derived by summing the "specific risk" and "general risk" capital requirements.[15]

The (minimum) *specific risk requirement* proposed is 8% of an institution's "gross equity positions" (i.e. the sum of all long and of all short equity positions) unless the portfolio is both "liquid" and "well diversified" (as interpreted by national regulators), in which case the capital charges may be reduced down to a figure as low as 4%, but no lower. The proposed (minimum) *general risk requirement*, which, again as in the CAD, applies to an institution's "overall net position" (i.e. the difference between the sum of the longs and the sum of the shorts), is also set at 8%.[16]

In principle, all *derivatives* held inside the trading book must be converted into (notional) positions in the relevant underlying and be subjected to the measures outlined above. Where the underlying is an index representing a "well diversified" portfolio of equities, the specific risk requirement may be reduced from 8% to 2% of the net position in the index. For options, a range of treatments is permissible, embracing both a "simplified approach" and "intermediate approaches" (covering both the "delta-plus" method and "scenario analysis").[17]

In calculating the capital charges, matched positions in each identical equity in each market (separate calculations have to be carried out for each national market in which the equities are held) may be fully offset, thereby allowing for the application of the minimum percentage charge to a single short or long position. Dispensation, in the form of lower than normal specific risk charges or, perhaps, the removal of such positions from the building block methodology, may also be given for certain hedging and arbitrage strategies (see Basle Committee 1995, pp. 20-21 of the "Planned supplement to the capital accord to incorporate market risks").

[15] However, if, in the future, wider convergence with securities regulators can be achieved, it is proposed that national authorities be allowed to retain the discretion to continue to apply a "comprehensive approach" (i.e. one that combines specific and general market risks in a single risk charge), provided that the application of such an approach would produce, in all circumstances, capital charges which were at least as great as those which would result from the application of the building block methodology.

[16] The figure reflects analysis of the price volatility of the principal equity indices in the major markets.

[17] For full details see Basle Committee 1995, Section A.5, of the "Planned supplement to the capital accord to incorporate market risks".

2. *For debt securities*

As for equities, the overall minimum capital requirements are expressed in terms of two separately calculated charges, one to cover "specific risk" and one to cover "general market risk" (or the interest rate risk in the portfolio). Once again, long and short positions may be offset in the calculation of the latter requirement, but offsetting in the calculation of the former is restricted to matched positions (including positions in derivatives) in the *identical* issue.

In establishing the appropriate capital charges for *specific risk*, the Committee classifies debt securities into five broad categories, mimicking the approach adopted under the CAD (see Annex A, Part II). Accordingly, government securities[18] receive a risk weighting of 0%,[19] "qualifying items"[20] attract a risk weight of either 0.25%, 1.00% or 1.60%, according to the residual maturity of the issue (the lower figure applying to issues with residual maturity of up to 6 months, the middle figure to maturities of between 6 and 24 months, and the highest figure to maturities exceeding 24 months), and the "other" items attract a risk weight of 8%. Finally, for "high-yield" debt securities, either a higher than 8% specific risk charge is applied and/or offsetting within the calculation of general market risk is not allowed between such securities and other debt securities.

In calculating charges for *general market risk*, designed to capture the risk of loss arising from changes in market interest rates, a choice

[18] Although national regulators are empowered to apply a positive specific risk weight to securities issued by certain foreign governments, especially if the securities are denominated in a currency other than that of the issuing government.

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

[20] To include securities issued by public sector entities and multilateral development banks, plus other securities that are:

(i) rated "investment-grade" by at least two credit-rating agencies specified by the relevant supervisors;

(ii) 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

(iii) unrated, but deemed to be of comparable investment quality by the bank, *and* the issuer has securities listed on a recognised stock exchange (subject to supervisory approval). The application of these qualifying criteria has to be monitored by supervisors.

National authorities also have the discretion to include in this category debt securities issued by banks in countries which are implementing the accord, but subject to the proviso that they take prompt remedial action if an institution fails to meet such requirements.

of two assessment methodologies is available, the "maturity" method and a "duration based" method.[21] The latter, however, may only be adopted with the consent of national supervisors, must be used on a continuous basis (unless a change in method is approved by the national authority), and be subject to supervisory monitoring.

Under the "maturity" method, long or short positions in debt securities (and their derivatives)[22] are slotted into a maturity ladder comprising thirteen maturity bands (fifteen for low coupon instruments). Fixed rate instruments are allocated on the basis of residual time to maturity, and floating rate instruments according to the next repricing date. The positions are then weighted to reflect their price sensitivity to changes in interest rates. The weights have two components: the "modified duration"[23] 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;[24] and an assumed change in yield which is designed to cover about two standard

[21] This involves 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 timeband (for full details see Basle Committee 1995, "Planned supplement to the capital accord to incorporate market risks", pp. 13-14).

[22] Opposite positions of the same amount in the same issues, whether actual or nominal, can be omitted from the reporting framework because they incur no interest rate risk. Similarly, "closely matched" swaps, forwards, futures and FRAs can be excluded if they satisfy the conditions laid down in Basle Committee 1995, paras. 20-22, pp. 15-16.

[23] Duration is a concept designed to measure the price sensitivity of debt securities to changes in interest rates. In mathematical terms, it is derived as follows:

$$D = \frac{\sum_{t=1}^{m}\left[\frac{tCt}{(1+r)^t}\right]}{\sum_{t=1}^{m}\left[\frac{Ct}{(1+r)^t}\right]}$$

where r = yield to maturity; Ct = cash payment in time t and m = total maturity

The "modified duration" of a debt instrument is $\frac{D}{(1+r)}$

[24] The duration of a bond, although primarily influenced by its maturity, is also influenced by its coupon. As a result, adjustments need to be made before slotting bonds with high price volatility (e.g. zero coupon bonds and deep discount bonds) into the maturity ladder. The proposed treatment is, in effect, to convert low coupon bonds into the equivalent of 8% bonds (with low coupon bonds being defined as bonds with a coupon of less than 3%), with higher risk weights attaching to low coupon bonds of a comparable maturity to bonds with a coupon greater than 3%, especially once residual maturities exceed 12 years (see Annex A, Part II).

deviations of one month's yield volatility in most major markets. The product of the two components provides the weighting factor for each time band. (The weighting factors and maturity ladder used are identical to those used under the CAD's approach – see Annex A, Part II – so they are not reproduced here.)

Having weighted the positions in this fashion, various netting arrangements are then applied before calculating the capital charge. As explained when analysing the CAD's approach to assessing the general risk arising from debt securities trades, this involves firstly offsetting the weighted longs and shorts in each time band ("vertical offsetting"), leaving a single short or long position for each band as a residual. A capital charge, known as a "vertical disallowance", of 10% of the sum of the "matched weighted positions" (i.e. the amounts of the vertical offsetting) in all maturity bands is prescribed to reflect the fact that, because each band would include positions whose maturities are not identical as well as different instruments with the same maturity, full vertical offsetting within the band would not reduce general risk to zero.

Secondly, the Basle Committee proposes that two rounds of partial "horizontal offsetting" also be allowed, equivalent to the netting "within zones" and "across zones" allowed under the CAD (see Annex A), to reflect the fact that interest rates at different points in the maturity spectrum tend to move together. Accordingly, the capital charges prescribed reflect the "disallowances"[25] applied to the horizontal offsetting undertaken between the net (i.e. "residual") positions[26] in each of the three time zones and subsequently between the net positions in the different zones.[27] These have to be added to the disallowances prescribed for the vertical offsetting and to the absolute amount of the residual net short or long position to arrive at the general market risk charge.

Using the terminology adopted when describing the CAD's approach, the (minimum) general market risk requirement is therefore equal to:

10% of the sum of the "matched weighted positions" in all maturity bands

[25] Greater recognition is given to hedging for offsets taking place within the same time zone than for offsets between different zones.

[26] Referred to as the "unmatched weighted position" in the discussion of the CAD (see Annex A, Part II).

[27] Note, however, that no vertical or horizontal offsetting between "high-yield" debt securities and other debt securities is allowed unless such high-yield debt securities are subjected to a specific risk weight in excess of 8%.

plus 40% of the *matched weighted position in zone 1*
plus 30% of the *matched weighted position in zone 2*
plus 30% of the *matched weighted position in zone 3*
plus 40% of the *matched weighted position between zones 1 and 2*
plus 40% of the *matched weighted position between zones 2 and 3*
plus 100%[28] of the *matched weighted position between zones 1 and 3*
plus 100% of the *residual unmatched weighted position.*

Adding to this sum the specific risk charge, calculated as shown above, yields the overall *minimum* capital charge to be met by an institution to cover the position risk arising from trading debt securities.[29]

Derivatives. In principle, all derivatives held inside the trading book are to be converted into (notional) positions in the relevant underlying which then become subject to the assessment procedures outlined above.[30] Alternative treatments for options, however, are

[28] The original Basle Committee proposal was 150%.

[29] Separate reporting ladders have to be used for each currency, except for those in which business is insignificant, and capital charges have to be calculated separately for each currency, with no offsetting between positions of opposite sign.

[30] No offsetting is allowed between positions in different currencies. However, fully matched positions in identical instruments with exactly the same issuer, coupon, currency and maturity are excluded from the reporting framework. Moreover, "closely matched" positions in the same category of instruments may be exempt from the application of the disallowance factors if the following conditions hold:

(i) the positions relate to the same underlying instruments;

(ii) the positions are of the same nominal value;

(iii) the positions are denominated in the same currency;

(iv) in the case of futures, the offsetting positions on the notional or underlying instruments to which the futures contract relates are for identical products and mature within seven days of each other;

(v) in the case of swaps and FRAs, the reference rate (for floating rate positions) is identical and/or the coupon (for fixed rate positions) "closely" matched (i.e. within 15 basis points); and

(vi) in the case of swaps, FRAs and forwards, the next interest fixing date or, for fixed coupon positions or forwards, the residual maturity, correspond with the following limits:

- less than one month hence: same day;
- between one month and one year hence: within 7 days;
- over one year hence: within 30 days.

available, as noted earlier – see Section A.5 of Basle Committee 1995. The amounts reported would be the market value of the principal amount of the underlying or notional underlying.

Futures and forward contracts, including forward rate agreements (FRAs), are to be treated as a combination of a long and a short position in a notional government security (i.e. with a zero specific risk requirement),[31] the maturity of a future or FRA being the period until delivery or exercise of the contract, plus – where applicable – the life of the underlying security. Where a range of deliverable instruments may be delivered to fulfil the contract, the institution is free to choose which deliverable security goes into the maturity ladder. Swaps, in turn, are to be treated as two notional positions in government securities with relevant maturities, i.e. residual maturities for fixed rate instruments and the period until the next interest fixing for floating rate instruments.

3. *To cover foreign exchange risk*

Under the Committee's proposals for dealing with foreign exchange (including gold) risk, institutions can either use the "shorthand" method or internal models (subject to supervisory approval, and satisfying the minimum standards outlined earlier).[32]

If the *shorthand method* is adopted, the Committee proposes a minimum capital charge (subject to a *de minimis* exemption) [33] of 8%

[31] Although the majority of interest-rate sensitive off-balance-sheet instruments (e.g. interest rate and currency swaps, FRAs, forward foreign exchange contracts and interest rate futures and options) relate to an underlying or notional underlying security which does not bear an identifiable specific risk, and hence do not incur a specific risk charge, this is not true of all such instruments. Accordingly, 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, based on the credit risk of the issuer (as explained in the text).

[32] The more complex approach outlined in the Committee's first set of proposals was referred to as the "simulation" method.

[33] National supervisors have the discretion to exempt a bank from these capital requirements if:

(i) the bank does not take foreign exchange positions for its own account;

(ii) its foreign currency business (defined as the greater of the sum of its gross longs and the sum of its gross shorts in all foreign currencies) does not exceed 100% of its "eligible capital"; and

(iii) the bank's "net open position", as defined in the text, does not exeed 2% of its "eligible capital".

of the "net open position", which is calculated by adding the sum of the short currency positions or the sum of the long positions, whichever is the greater, to the total of the net position (short or long) in gold, regardless of sign. In order to evaluate its capital charges a bank has therefore to firstly calculate its net position in each currency and gold, converting the nominal amounts of the net positions at spot rates into the reporting currency. The net open position in any currency is, in turn, derived by summing the following:

(i) the net spot position (i.e. all asset items less all liability items, including accrued interest, denominated in the currency in question);

(ii) 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);[34]

(iii) guarantees (and similar instruments) that are certain to be called and are likely to be irrecoverable;

(iv) net future income/expenses not yet accrued but already fully hedged (at the discretion of the reporting institution);

(v) the net delta (or delta-based) equivalent of the total book of foreign currency options;[35] and

(vi) any other items representing a profit or loss in foreign currencies (this depends on the accounting conventions applicable in different countries).

For measurement purposes, positions in composite currencies may be treated either as a currency in their own right or split into their component parts (on a consistent basis). And any positions taken to deliberately hedge (partially or totally) against the adverse effect of exchange rate movements on the capital adequacy ratio can be excluded from the calculation or net open currency position if the following conditions are met:[36]

[34] Forward currency positions would normally be valued at current spot rates but banks are allowed to use net present values derived by discounting the cash flows.

[35] Possible alternatives to the use of net delta values as the measure of exposure arising from options trading are discussed in section A.5 of Basle Committee 1995.

[36] The same treatment can be applied to positions related to items that are deducted from a bank's capital when calculating its capital base.

(i) such positions are of a "structural" (i.e. of a non-dealing) nature (as defined by national supervisors);

(ii) national supervisors are satisfied that the structural positions excluded do no more than protect the bank's capital adequacy ratio; and

(iii) any exclusion of positions is applied consistently, with the treatment of the hedges remaining the same for the life of the assets or other items.

4. *To cover commodities risk*

Under the Committee's proposals for handling commodities risk, banks can either use models to measure position risk – subject, of course, to local supervisory approval and to satisfying the set of safeguards applicable to the use of any model for market risk assessment purposes – or a "standardised approach". If the latter route is adopted banks have a further choice. They may either adopt a "simplified approach" or a more complex approach involving the use of maturity ladders. Each of these approaches is explained in more detail in Annex H.

Differences between the European and Basle Committee approaches

Although there are many similarities between the EC and Basle Committee approaches to measuring and assessing market risks arising from intermediaries' trading activities in debts, equities, derivatives and foreign exchange, there are a number of significant differences (summarised in Annex I).

In terms of the scope of coverage, the EC's approach, in the guise of the CAD, is much more comprehensive. For example, it contains provisions relating to underwriting exposures, settlement risk, counterparty risk and large exposures risk and also sets requirements to cover "other" risks (for investment firms only) and risks not covered by either the CAD or the SRD. None of these areas are

covered by the Basle Committee's proposals, although the assessment of commodities risk is exclusive to the latter.[37]

On the question of what instruments should be eligible for inclusion in regulatory capital and what further restrictions/limitations they ought to be subject to, the Basle Committee has now moved closer to the less restrictive approach outlined in the CAD. For example, the Committee has now sanctioned the use of short-term subordinated debt ("Tier 3" capital in Basle Committee parlance), albeit subject to restrictions and limitations, to cover all market risks, including foreign exchange risk and commodities risk; and the "lock-in" clause imposed by the Committee on "qualifying" subordinated loan capital is no longer more demanding than that imposed under the CAD. The only remaining difference is that, unlike the EC, the Basle Committee insists that only *unsecured* loan capital is eligible for inclusion in Tier 3.

Moreover, if the focus of attention is on the limitations placed on the use of short term subordinated loan capital, the CAD is the more restrictive. This is because its use is usually restricted to 150% of the original own funds ("Tier 1" capital in Basle Committee parlance) allocated to support trading book risks, and may only approach that maximum with the agreement of national supervisors. Exceptionally, however, at national discretion, this ceiling may be relaxed to 250% of allocated original own funds. By way of contrast, the Basle Committee is happy to see regulators apply the 250% limit on an across-the-board basis.

In the assessment of position risk on equities, the Basle Committee is again the more stringent, setting the minimum specific risk capital charge at 8% [reducing, at national discretion, to 4% for liquid and well-diversified portfolios (as determined by national supervisors)] of a firm's gross equity positions, compared with the minimum figure of 4% (reducing to 2% for highly-liquid and well diversified portfolios satisfying certain objective criteria) prescribed under the CAD.

Finally, in the assessment of foreign exchange risk – the position risk on traded debt instruments is assessed in an almost identical

[37] However, counterparty risk arising from transactions in derivatives (but not securities) is already captured under the accord, while the monitoring of large exposures arising from banks' *lending* activities is the subject of a guidance note issued by the Committee in 1991 (large exposures are also covered by the LED for EC credit institutions).

fashion – the Basle Committee is again the most demanding for, under its basic approach, it sets the capital charge at 8% of an institution's net open position, as compared with the CAD's 8% charge levied on the *excess* of an institution's overall net foreign exchange position over and above a figure equal to 2% of its total own funds under the standard approach. Moreover, its measures are applied to gold as well as currencies, unlike the CAD's; and the "dispensations" available under the CAD for positions in currencies subject to legally-binding inter-governmental agreements limiting their variability *vis-à-vis* other currencies, for participants in the second stage of EMU, and for positions in "closely correlated" currencies are not entertained by the Committee. Contrariwise, a *de minimis* exemption from foreign exchange risk capital charges is not available under the CAD, and the range of treatments available for foreign currency options is much more limited (in fact, to just the net delta valuation basis) under the CAD.

Likely future developments

Given the lead taken by Europe in the prescription of capital charges for market risks incurred by both banks and securities firms, it is likely that IOSCO will be pressurised into reaching a common position on the subject in advance of the CAD's implementation – end-December 1995 – both to preserve the international competitiveness of securities firms authorised in their jurisdictions and to influence the future course of the debate. Although some securities regulators, such as the Securities and Exchange Commission (SEC) in the US, are known to harbour grave reservations about the assessment methodologies adopted and about the absolute size of some of the minimum capital charges agreed to under the CAD (e.g. the 2% specific risk capital charge for highly liquid and well-diversified equity portfolios is viewed as being "imprudent" by the SEC's chairman, a line also taken by the Basle Committee), their ability to shape the future course of convergence in capital standards – both across industries and between countries – will be seriously impaired unless they can reach a wider consensus between themselves.

Even if this consensus does materialise, however, it is far from certain that Europe will be forced to "level-up" its supervisory requirements, as both the Basle Committee and IOSCO are likely to call for.[38] Nevertheless, the "review" clause (Article 14) in the CAD does, in principle, provide the opportunity for a reassessment of the European standards in the light of developments in the alternative fora. Whether or not the Commission bows to the inevitable pressure remains to be seen, however, the outcome itself being heavily influenced by market developments. Lack of crises in European securities industries between the end of 1995 and the end of 1998 might serve to stiffen its resolve, while widescale crises would undoubtedly weaken its position and reduce the prospect of an intransigent stance being adopted.

Conclusions

The continuing quest for convergence in capital standards, across both finance industry and national frontiers, and the desire to complete the internal market in financial services, have led the Member States of Europe to agree to the adoption of laws – in the shape of the CAD and the SRD – which will facilitate the achievement of such goals. The convergence goal, desired for both stability and competitive equality reasons, has also stimulated the Basle Committee into deliberating, in a "securities friendly" fashion, the means of amending and extending the "capital accord" reached in July 1988 to accommodate the market risks incurred by banks. While there is considerable agreement, on both methodological issues and the

[38] Although, somewhat ironically, the Basle Committee's belated sanctioning of the use, by banks, of capital requirements generated by internal computer-based risk control mechanisms as an alternative to meeting prescribed capital changes is likely to put the European Commission under intense pressure from Member States to *relax* its stance and also cater for the use of internal models. Even if the Commission proves willing to accept the adequacy of the safeguards provided by the "minimum standards" established by the Committee, it may still baulk at the dangers arising from placing even more reliance on the competence and integrity of management and the adequacy of internal controls as the means of ensuring overall stability. Moreover, it is doubtful, especially in some jurisdictions, if supervisors are up to the task of policing effectively firms' internal controls and software packages.

choice of magnitude for minimum capital charges (notwithstanding the disagreement over the capital charge to be applied to cover equity specific risk), between the Basle Committee and the European Commission, significant differences remain.

It is to be hoped that further progress can be made in the convergence process, both between the Basle Committee and the European Commission on the one hand, and between these two bodies and IOSCO on the other to ensure that the dangers posed for international financial stability by a plethora of competing capital adequacy assessment regimes are minimised. A by-product of such a development would be a further reduction in the number and significance of competitive anomalies arising from regulatory asymmetries.

ANNEX A

Capital requirements imposed under the CAD to deal with position risk

Under the CAD, a different set of rules applies to each of equities, traded debt instruments, derivatives and the underwriting of equities and debt securities when calculating position (i.e. market) risk requirements. Before looking at each set in turn, it is worth noting at this point, however, that both "long" (i.e. net asset) positions and "short" (i.e. net liability) positions are taken into account in the calculations, and that firms have to adopt a "mark-to-market" approach to valuing such positions in their trading books. Moreover, the so-called "building block approach" to assessing position risk is adopted in the CAD, requiring that total position risk be broken down into "specific risk" and "general risk" components. [The specific risk attaching to an instrument is the risk of a price change due to factors relating specifically to the issuer (or, in the case of a derivative, factors relating to the underlying instrument); in contrast, general risk is the risk of a price change due, in the case of equities or their derivatives, to market movements unrelated to any specific equity or, in the case of debt instruments or their derivatives, to interest rate fluctuations.]

1. *The treatment of equities*

The Specific Risk Capital Requirement = 4% of the firm's "overall gross position" in equities, where the "overall gross position" is defined as the sum of the net positions (long or short) in all equities. [N.B. Positions in stock index futures are generally treated as positions in the equities represented by such futures. However, certain exchange-traded stock index futures – i.e. those which are "broadly diversified" – are disregarded in the calculation.] The 4% figure may, however, at national discretion, be reduced to 2% for "diversified"[1] or "highly liquid"[2] portfolios, but the reduction will *not* apply to equities of an issuer any of whose traded debt instruments attract a specific risk weighting of 8%. (As the 8% weighting applies to all debt instruments except "Central Government Items" and "Qualifying Items" – see below – the reduction will therefore only apply to the equities of the issuers of the debt falling within the latter category.)

[1] i.e. portfolios where no individual position comprises more than 5% of the value of the whole equity portfolio. However, national regulators may authorise individual positions of up to 10% provided that the total of such positions does not exceed 50% of the portfolio.

[2] Not defined in the CAD.

The General Risk Capital Requirement = 8% of the firm's "overall net position" in equities where the "overall net position" is derived by offsetting the sum of the firm's long positions against the total of its short positions. (N.B. In calculating its net positions in each equity the firm has to include its positions in certain exchange traded stock index futures.) Separate calculations must be made for each national market.

Total Position Risk Capital Requirement = Specific Risk Capital Requirement + General Risk Capital Requirement

2. *The treatment of traded debt instruments*

The Specific Risk Capital Requirement = the sum of all the "weighted positions" (short or long) for the different instruments, where the "weighted position" of a given instrument is the "net position" (i.e. the difference between the firm's long and short positions, converted daily at spot rates into the firm's reporting currency) multiplied by the relevant risk weighting – see below. (Holdings of debt instruments issued by firms themselves are disregarded.)

The *risk weightings* are designed to reflect the level of specific risk perceived to attract to traded debt instruments by virtue of the nature of the issuer:

Central government issued debt instruments attract a risk weighting of 0%.

"Qualifying Items" attract concessionary weights depending on their residual maturity

up to 6 months	0.25%
over 6 months and up to 24 months	1.00%
over 24 months	1.6%

Debt instruments counting as "qualifying items" comprise those qualifying for a 20% risk weighting under the SRD, e.g. a debt security issued by an EC bank; those issued by investment firms as defined in the CAD (plus debt issued by comparable non-EC firms subject to prudential rules as stringent as those in the CAD); debt which is (a) listed on a regulated market within the EC, or on a non-EC stock exchange which is recognised by the Member States of the firm for whose trading book the risk weighting is being calculated; (b) of acceptable liquidity; and (c) a debt the solvency of whose issuer is considered such that the risk of default is no greater than that for an instrument meeting a 20% risk weighting under the SRD (member States can, however, exercise this criterion flexibly); all other items attract a risk weight of 8%.

The General Risk Capital Requirement under the "maturity-based" approach[3]

equals 10% of the sum of the "matched weighted positions" in all maturity bands

plus 40% of the matched weighted position in zone 1 (residual maturity of up to one year)

plus 30% of the matched weighted position in zone 2 (residual maturity of between one and four years)

plus 30% of the matched weighted position in zone 3 (residual maturities of over four years)

plus 40% of the matched weighted position between zones 1 and 2

plus 40% of the matched weighted position between zones 2 and 3

plus 150% of the matched weighted position between zones 1 and 3

plus 100% of the residual unmatched weighted positions between zones

where:

(i) the *matched weighted position* in a given *maturity band* (see below) is the amount of the firm's total risk weighted (see below) long positions matched by its risk weighted short positions in that particular time band. The residual long or short position is referred to as the "*unmatched* weighted position" for that band.

The risk weights depend upon the residual maturity of the security – the longer the residual maturity, the greater the risk weight, as shown in the table below – for fixed rate instruments, and on the basis of the period until the interest rate is next set for variable rate instruments. Debt instruments are also distinguished according to whether they have a coupon of less than 3% or 3% or over (see table below) – the former tend to have a slightly higher risk weighting;

[3] The alternative approach which may be adopted, if national supervisors allow, is the "duration-based" approach. This approach generates a lower capital charge – largely because of the much lower charges levied against the matched weighted positions in zones – reflecting the allowance given for the more exact measurement of interest rate sensitivity and the accommodation of interim cash flows. For further details see Annex 1 of the CAD.

Zone	Maturity band		Weighting (in %)	Assumed interest rate change (in %)
	Coupon of 3% or more	Coupon of less than 3%		
One	0 ≤ 1 month	0 ≤ 1 month	0.00	–
	> 1 ≤ 3 months	> 1 ≤ 3 months	0.20	1.00
	> 3 ≤ 6 months	> 3 ≤ 6 months	0.40	1.00
	> 6 ≤ 12 months	> 6 ≤ 12 months	0.70	1.00
Two	> 1 ≤ 2 years	> 1.0 ≤ 1.9 years	1.25	0.90
	> 2 ≤ 3 years	> 1.9 ≤ 2.8 years	1.75	0.80
	> 3 ≤ 4 years	> 2.8 ≤ 3.6 years	2.25	0.75
Three	> 4 ≤ 5 years	> 3.6 ≤ 4.3 years	2.75	0.75
	> 5 ≤ 7 years	> 4.3 ≤ 5.7 years	3.25	0.70
	> 7 ≤ 10 years	> 5.7 ≤ 7.3 years	3.75	0.65
	> 10 ≤ 15 years	> 7.3 ≤ 9.3 years	4.50	0.60
	> 15 ≤ 20 years	> 9.3 ≤ 10.6 years	5.25	0.60
	> 20 years	> 10.6 ≤ 12.0 years	6.00	0.60
		> 12.0 ≤ 20.0 years	8.00	0.60
		> 20 years	12.50	0.60

(ii) the "matched weighted position" in a particular *zone* is the amount of the firm's total of unmatched weighted long positions for all bands in that zone matched by the total of its unmatched weighted short positions for those bands. The residual, or difference between the two sums, is called the "*unmatched* weighted position" for that zone

and

(iii) the "matched weighted position between zones 2 and 1" is the amount of the unmatched weighted long (short) position in zone 1 which is matched by the unmatched weighted short (long) position in zone 2. The "matched weighted position between zones 2 and 3" is the residual of the above calculation that is matched by the unmatched weighted position in zone 3. (N.B. The firm may, alternatively, carry out the matching between zones 2 and 3 and offset the residual unmatched position against that of zone 1.)

Finally, the "matched position between zones 1 and 3" is the amount of the residual unmatched weighted position in zone 1 matched by the residual of zone 3's matching with zone 2.

As can be seen, the general risk capital requirements for traded debt instruments are thus determined by the residual maturities (for fixed rate instruments) of the instruments and their coupons, with allowance being made

for offsetting positions within the same maturity band, within the same zone (groups of maturity bands) and across zones. Generally, the closer the residual maturity of the positions held by a firm, the greater the allowances given.

Again, *The Total Position Risk Requirement* is derived by summing the specific and general risk requirements.

3. *The treatment of derivative instruments*

To incorporate these instruments into the "building block" approach, they are generally broken down into long and short positions in the respective underlying debt or equity instruments, e.g. an interest rate swap where the institution receives fixed interest and pays floating would be split into a long position in a fixed rate debt instrument and a short position in a floating rate instrument maturing at the next interest rate reset date.

For contracts exposed to *interest rate risk* (e.g. interest rate futures, swaps, forward interest-rate agreements), the long and short positions derived are treated as notional holdings in Central Government securities and thus attract a nil *specific risk* weighting. For the *general risk* requirement the positions are to be slotted into their respective maturity or duration time zones, in the same manner as ordinary securities. Alternatively, at *national discretion*, institutions which mark to market their interest rate products and employ discounted cash flow techniques to measure and monitor interest rate sensitivity may use such models to calculate their positions as long as the results obtained are in line with the interest rate sensitivity of the underlying cash flows. (For another alternative approach permissible see CAD, Annex 1, para. 9.)

For all *exchange-traded instruments*, the capital charge may, at national discretion, be set equal to the margin required by the exchange.

Equity index derivatives (including stock index futures and options) may be treated as positions in the underlying equities, and firms may offset them against positions in those equities if close correlation exists between the derivatives and the underlying equities.

Finally, exchange-traded *futures* covering what regulators decide are "broadly diversified indices" attract a general risk capital requirement of 8% and a specific risk requirement of zero.

4. *The treatment of underwriting exposures*

The CAD requires institutions progressively to increase their capital cover the longer the underwriting exposures on debt and equity instruments last, with the maximum capital requirement being reached 5 working days after the institution's initial commitment. In calculating its capital requirement, an institution may disregard underwriting positions which are subscribed or sub-underwritten by "third parties".

The procedure for calculating the *reduced underwriting position*, to which the specific and general risk requirements are applied (treating the position as a position in the debt or equity in question), is as follows:

(i) calculate the institution's "net" position in the instrument, arising from its underwriting obligation, by disregarding that part of the issue subscribed or sub-underwritten and deducting short positions in the same instruments; and then

(ii) apply a sliding scale of percentage factors to the net underwriting positions to derive the "reduced underwriting position". The scale is:

Working day 0 (i.e. the working day on which the institution becomes unconditionally committed to accepting a known quantity of securities at an agreed price)	0%
Working day 1	10%
Working days 2 to 3	25%
Working day 4	50%
Working day 5	75%
After working day 5	100%

Notwithstanding that an institution's underwriting exposure is treated as being nil on "day zero", the CAD imposes an additional obligation on regulators to ensure that a firm holds "sufficient capital" against the risk of loss which exists between the time of the initial commitment and "working day 1" (no guidance is given, however, as to what constitutes "sufficient capital").

ANNEX B

Capital requirements imposed under the CAD to deal with settlement risk

Settlement (or delivery) risk arises because movements in the market prices of securities may involve a loss to institutions if transactions entered into are not settled on the agreed dates.

Under the CAD, institutions are allowed to calculate the capital requirements[1] imposed to cover this risk in one of two ways:

(i) by applying, in the instances where the institution is exposed to loss, to the *price difference* (i.e. the difference between the agreed settlement price and current market price) a percentage factor which increases with the delay in settlement (see Column A below); or

(ii) by applying a different set of factors (see Column B below) to the *agreed settlement price* when the delay in settlement does not exceed 45 days.

Option (ii), however, can only be adopted with the permission of regulators; and, if it is adopted, must be used for calculating the institution's settlement on *all* of its transactions.

	Weighting factors	
Delay in Settlement: Number of working days after due settlement date	Column A %	Column B %
5-15	8	0.5
16-30	50	4.0
31-45	75	9.0
46 or more	100	–

[1] These requirements do not cover repo's, reverse repo's, securities lending or borrowing, which are dealt with under the treatment of "counterparty risk" – see Annex C.

ANNEX C

Capital requirements imposed under the CAD to deal with counterparty risk

Counterparty risk is the risk that the other party to a transaction defaults before completion, exposing an institution to a loss up to the total value of the transaction.

Under the CAD, the capital requirement to cover such risk on "free deliveries" (i.e. where payments do not match deliveries) is set at 8% of the value of the securities or cash owed to the institution multiplied by the Solvency Ratio Directive (SRD) risk weighting applicable to the counterparty. The reduced risk weightings applicable, under certain circumstances, to EC and OECD banks under the SRD are extended under the CAD to other categories of counterparty namely: (i) investment firms subject to the CAD; (ii) similar firms subject to comparable supervision in non-EC countries; and (iii) recognised clearing houses and exchanges.

For *repurchase and reverse repurchase agreements and securities lending and borrowing* based on securities included in the traded book, the capital requirement is 8% of any "unfavourable difference" between the market value of the securities concerned and the loan or collateral, multiplied by the SRD risk weighting applicable to the counterparty.

For all *over the counter (OTC) derivatives*, the counterparty risk requirement is to be calculated in accordance with the SRD (i.e. the charge must be equal to the replacement cost of the contract multiplied by a counterparty weighting, plus an "add-on" in respect of potential future credit exposure, if the "current exposure" method is used. If the "original exposure" method is adopted instead, which is permitted if national regulators agree, a simpler, two stage transformation is required which avoids the need to mark the contract to market – see Hall 1994).

ANNEX D

Capital requirements imposed under the CAD to deal with large exposures risk arising from intermediaries' trading-book business

Under the CAD, institutions are required to monitor and control their "large" *market risk exposures* to individual counterparties and groups of connected counterparties. The basis for *measuring* these (overall)[1] exposures and the *limits* to be imposed upon them derive mainly from the Large Exposures Directive (LED), i.e. no exposure should exceed 25% of own funds,[2] and the sum of all such large exposures (that is, those whose value is greater than or equal to 10% of own funds) should not exceed 800% of own funds.

However, at national discretion, institutions may be allowed to exceed the 25% limit, but only if:

(i) such "excesses" relate only to the trading book;

(ii) an additional capital charge is taken to cover such trading book excesses. This charge is calculated by selecting the individual exposures which attract the highest specific risk capital requirements and applying designated capital requirements. For exposures of no more than 10 days old, a 200% factor

[1] For each individual counterparty or group of connected counterparties, the *overall exposure* is defined as the sum of the firm's trading book and non-trading book large exposures. Trading book exposures to individual counterparties are made up of:

(i) net long positions in all financial instruments issued by the counterparty concerned;

(ii) net underwriting exposures as adjusted by the specified scale factors (see Annex A, part IV); and

(iii) positions in repo's (and reverse repo's) and securities lending (and borrowing) and derivative instruments and exposures to settlement risk. (These exposures are to be calculated as described in Annex C without application of the weightings for counterparty risk.)

For investment firms' non-trading book exposures, only those not deducted from own funds (i.e. those which are not illiquid assets) need be taken into account.

[2] Certain long exposure *exemptions* which may be granted to credit institutions under the LED are extended to exposures on investment firms and recognised clearing houses and exchanges. In particular, national regulators may exempt firms' exposures to other investment firms with maturities of one year or less and may also allow firms' exposures to other firms with maturities of greater than one year to be weighted and reported at lower amounts.

must be applied to the specific risk requirement. For those over 10 days old, the following factors must be applied to the specific risk requirements:

Size of the excesses (as % of own funds)	Factors (in %)
Up to 40	200
40 to 60	300
60 to 80	400
80 to 100	500
100 to 250	600
Over 250	900

(iii) for those counterparty exposures where the excess is no more than 10 days old, the total trading book exposure to that counterparty does not exceed 500% of own funds;

(iv) excesses of more than 10 days old do not, in aggregate, exceed 600% of own funds, and

(v) institutions running such excesses report, to the regulatory authorities, on a three monthly basis, all excesses that have arisen in the preceding three months.

ANNEX E

Capital requirements imposed under the CAD to deal with foreign exchange risk

Under the CAD, capital is required to cover any excess in a firm's "overall net foreign exchange position" above 2% of its own funds. The capital requirement is 8% of the excess, and applies to virtually all foreign exchange exposures, not just those arising from the trading book.

The firm's *overall net foreign exchange position* is the higher of: (i) the total of the net short positions; and (ii) the total of the net long positions, in all currencies other than the firm's reporting currency, converted at spot rates into the reporting currency.

For each currency, the *net open position* comprises:

(i) the net spot position (i.e. the net asset position in the currency in question);

(ii) the net forward position (i.e. all amounts to be received less all amounts to be paid under forward exchange transactions, including currency futures and the principal on currency swaps not included in the spot position);

(iii) irrevocable guarantees that are certain to be called;

(iv) net future income/expenses not yet accrued but already fully hedged (including, with the consent of regulators, net future income/expenses not yet entered into accounting records but already fully hedged by forward foreign exchange transactions);

(v) the net delta equivalent (where delta is the expected change in price as a proportion of a small change in the price of the underlying instrument) of the firm's foreign currency options; and

(vi) the market value of non-foreign-currency options.

In calculating the net open positions, firms may exclude, with regulatory consent, non-trading or structural positions taken to hedge foreign exchange movements adversely affecting its capital ratio, as well as such positions relating to items deducted in the calculation of own funds. A firm may also, again with regulatory consent, apply discounting techniques to arrive at its net open currency positions.

For the time being, considerable *discretion* is also given Member States to set alternative procedures for the calculation of the overall capital requirement against foreign exchange risk, provided they notify the Council and Commission of the methods allowed. For example:

(i) Lower capital requirements may be set in respect of positions in currencies which are *closely correlated* (i.e. those for which historical evidence indicates a very low likelihood – see Annex III, para. 6 of the CAD – of significant rate variations). If this discretion is adopted the capital requirements are:

- for matched positions in closely correlated currencies, 4% of their value;
- for unmatched positions in closely correlated currencies and for all positions in other currencies, 8% of the higher of: (a) the sum of the net short positions, and (b) the sum of the net long positions, in those currencies. Positions to which the 4% capital requirement applies are excluded in performing the calculation.

(ii) Regulators are permitted to allow firms to employ *other methods* of calculating capital requirements to cover foreign exchange risk provided that the resulting capital requirement is sufficient to exceed each of the following:

(a) any losses which have occurred in the firm's current positions in at least 95% of the rolling 10 working day periods over the preceding 5 years (or in at least 99% of such periods over the preceding 3 years);

(b) based on an analysis of such 10 day periods over the preceding 5 years, the likely loss over the following such 10 day period 95% or more of the time (99% where the analysis covers only the preceding 3 years); and

(c) 2% of the firm's (overall) net open foreign exchange position (as calculated above).

(iii) The Directive also provides that where currency fluctuations are limited by legally-binding *inter-governmental agreements*, such as the snake within the EMS, regulators may permit[1] firms to exclude their positions in those currencies when calculating capital for foreign exchange risk under the above rules. Nevertheless, capital must still be provided to cover the foreign exchange risk on such currencies, albeit at reduced levels:

- matched positions in such currencies attract a capital requirement of at least half of the permissible fluctuations under the inter-governmental agreement. For currencies participating in the second stage of EMU, regulators may reduce the capital requirement to 1.6% of the value of the matched positions;
- unmatched positions are treated in exactly the same way as other currencies.

Despite the costs involved in developing the appropriate systems, the concessions allowed under these alternative approaches are likely to provide sufficiently strong incentives for banks to opt for them provided, of course, that their national supervisors are willing to recognise them.

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[1] Given, however, that the drafting of the CAD took place before the EMS upheavals of Autumn 1992 and its effective abandonment in July 1993 regulators are likely to take a strict line on this.

ANNEX F

The definition of "own funds" under the Own Funds Directive

A. Definition

"Own funds" are defined to comprise the following elements:

(i) paid-up share capital plus share premium accounts;

(ii) "eligible" disclosed reserves plus published interim retained profits (net of foreseeable charges and dividends) which have been verified by (external) auditors;

(iii) "eligible" revaluation reserves;

(iv) funds for general banking risks;

(v) "allowable" value adjustments;

(vi) certain other funds and securities which satisfy the requirements of Article 3;

(vii) commitments of the members of credit institutions set up as co-operative societies and of the borrowers of certain institutions organised as funds;

(viii) fixed-term cumulative preference shares and subordinated loan capital which satisfy the requirements of Article 4(3).

Of these elements, items (i), (ii) and (iv) are classified as "original own funds" and items (iii) and (v) to (viii) as "additional own funds".

B. Limits

(i) the total amount of "additional own funds" may not exceed 100% of the total of "original own funds" (excluding funds for general banking risks but including holdings of own shares at book value, intangible assets and current year losses); and

(ii) the total of items (vii) and (viii) may not exceed 50% of "original own funds" (excluding funds for general banking risks, holdings of own shares at book value, intangible assets and current year losses).

C. Deductions

The following items have to be deducted from the total of own funds to arrive at the definition of the capital base to be used in the assessment of capital adequacy:

(i) holdings in other credit and financial institutions amounting to more than 10% of the equity of the institutions in which the investments are made (full deduction is required); and

(ii) such holdings which constitute less than 10% of the equity of the institutions in which the investment is made but which, in aggregate, exceed 10% of the own funds of the reporting institution (the "excess" amount only must be deducted).

ANNEX G

Alternative definition of own funds allowed, at national discretion, under the CAD

Own Funds (as defined in Directive 89/299/EEC)[1]

Plus Net trading book profits (net of any foreseeable charges or dividends) less net losses on other business

Plus Subordinated loan capital [2,3]

Less[4] Illiquid assets[5]

[1] But excluding items (12) and (13) of Article 2(1) of Directive 89/299/EEC for those investment firms required to deduct "illiquid assets" from own funds in accordance with Annex V, para. 2 of the CAD.

[2] Provided that: (i) it has an initial maturity of at least two years; (ii) it is fully paid up; (iii) the debt cannot be repaid, other than on the winding-up of the institution, before the agreed repayment date without the approval of the competent authorities, and (iv) the subordinated loan capital may not exceed a maximum of 150% of the original own funds left to meet the requirements laid down in Annexes I to IV and VI of the CAD, and may approach that maximum only in particular circumstances acceptable to the relevant authorities. (Exceptions to this rule for investment firms and credit institutions are specified in paras. 6 and 7 of Annex V of the CAD respectively.) Neither the principal nor the interest on such subordinated loan capital may be repaid if such repayment would mean that the own funds of the institution in question would then amount to less than 100% of the institution's overall requirements. In addition, an institution is required to notify the competent authority of all such repayments as soon as its own funds fall below 120% of its overall requirements.

[3] The competent authorities may permit institutions to replace this with items (3) and (5) to (8) of Article 2(1) of Directive 89/299/EEC if they so choose.

[4] The deduction is at the discretion of the competent authorities.

[5] As defined in para. 8 of Annex V of the CAD.

ANNEX H

Basle Committee's proposed capital requirements for dealing with commodities risk

As for the other categories of market risk, banks may use internal models to generate capital charges to cover commodities risk as long as they are subject to the "safeguards" outlined in the text (indeed, major traders are expected over time to adopt such an approach). In the context of commodities risk, the methodology adopted must encompass "directional risk" (to capture the exposure from changes in spot prices arising from net open position), "forward gap" and "interest rate risk" (to capture the exposure to changes in forward prices arising from maturity mismatches) and "basis risk" (to capture the exposure to changes in the price relationships between two similar, but not identical, commodities). Moreover, it is essential that the models used take proper account of market characteristics, notably delivery dates and the scope traders have for closing out positions.

For those banks not using a models-based approach, the Committee has proposed two possible measurement frameworks for adoption under the "standardised approach" – a simplified approach and a more complex approach.

Under the *complex approach*, a bank must first convert, at current spot rates, its net positions (spot plus forwards) in commodities, as expressed in standard units of measurement, into the national currency. Positions in the separate commodities must then be entered into a maturity ladder – a separate one for each commodity (excluding gold, which is treated as a foreign currency) – with physical stocks being allocated to the first time band. For each time band, the sum of short and long positions (in national currency terms) which are matched must then be multiplied by the appropriate "spread rate" for that band – see the table below – to give the relevant capital charges to cover curvature/spread risk (i.e. the forward gap and interest rate risk arising within a given time band).

Time-band	Spread Rate (%)
0- 1 month	1.5
1- 3 months	1.5
3- 6 months	1.5
6-12 months	1.5
1- 2 years	1.5
2- 3 years	1.5
Over 3 years	1.5

The *residual* net positions from the nearer time-bands may then be carried forward to offset exposures in time-bands further out, although a surcharge equal to 0.6% of the net position carried forward would have to be added in respect of each time-band that the net position is carried forward from to recognise the lack of perfect hedging that would result. The capital charge for each matched amount created by carrying forward positions would then be calculated in accordance with the procedures outlined above. At the end of this process a bank will have either only long or only short positions, to which a capital charge of 15% must be applied.

All commodity *derivatives* (and off-balance-sheet positions) which are affected by changes in commodity prices must also be included in the measurement framework (although options subject to risk measurement approaches other than the "delta plus" basis should be handled in accordance with the models-based approach). *Futures and forward contracts* relating to individual commodities should be incorporated as notional amounts of the standard unit of measurement and should be assigned a maturity determined in accordance with the expiry date. *Commodity swaps* where one leg is a fixed price and the other a current market price should be incorporated as a series of positions equal to the notional amount of the contract, with one position corresponding with each payment on the swap and slotted into the maturity ladder accordingly (the positions would be "long" if the bank is paying fixed and receiving floating, and "short" if it is receiving fixed and paying floating). Finally, commodity swaps where the legs are in different commodities must be reported in the relevant reporting ladder. No offsetting will be allowed in this regard except where the commodities belong to the same "sub-category".

Under the *simplified approach*, the same procedure described above is used to derive the capital charge to cover directional risk. Accordingly, the net position, long or short, in each commodity will attract a capital charge of 15%. In order to protect the bank against basis risk, interest rate risk and forward gap risk, however, the capital charge for each commodity derived in accordance with the procedures adopted in respect of the complex approach must be subject to an additional capital charge equivalent to 3% of the bank's gross positions, long plus short, in that particular commodity. Banks should use the current spot price in valuing the gross positions in commodity derivatives for this purpose.

ANNEX I

Differences between the EC and Basle Committee approaches to measuring and assessing market risk for firm engaged in investment business

Area of Concern	EC Approach	Basle Committee Approach
1. Institutions subject to the provisions	Investment firms and credit institutions in the EU and those EFTA countries covered by the EEA Agreement of May 1992	Banks in the G10 area and elsewhere where national supervisors mandate compliance
2. Legal status of the provisions	The CAD is legally binding on Member States of the EU	A "gentleman's agreement" between G10 central bank governors
3. Group supervision	Consolidated supervision is the norm for financial groups, although national supervisors have the discretion to waive it for investment (but not banking) groups which satisfy certain criteria (see Article 7 of the CAD, paras. 4 to 7)	"Banking" groups must be supervised on a consolidated basis for market risk
4. Date of implementation	From the end of 1995	From the end of 1997
5. Scope of coverage	Apart from position risk, covers underwriting exposures, settlement risk, counterparty risk and large exposures risk arising from trading-book positions in debt and equities (foreign exchange risk is assessed on all business activities); sets capital requirements to cover "other" risks (for investment firms only) and risks not covered by the CAD or the SRD	Only covers position risk and foreign exchange risk arising from ttansactions in debt, equities, commodities and foreign exchange; does not prescribe capital charges to cover risks not already covered by the above-mentioned capital charges
6. Definition of capital for regulatory purposes	"Qualifying" criteria for eligibility of short-term subordinated debt for inclusion in regulatory capital do not include a provision that it must be unsecured; the limitations imposed on the use of such debt are more restrictive than those applying under the Basle Committee's approach	Short-term subordinated debt needs to be unsecured if it is to be eligible for inclusion in "Tier 3" capital; the limitations on its usage are less restrictive than those applicable under the CAD
7. Assessment of position risk on equities	Minimum specific risk capital charge is set at 4% (reducing to 2% for "highly liquid" and "well diversified" portfolios) of a firm's overall gross positions	Minimum specific risk capital charge set at 8% (reducing to 4% for liquid and well-diversified portfolios) of a bank's gross equity positions
8. Assessment of foreign exchange risk	Capital charge set at 8% of the excess of an institution's net open position over 2% of own funds; precious metals not subject to the provisions; "dispensations" available for positions in currencies subject to legally-binding intergovernmental agreements limiting variability *vis-à-vis* other currencies, participants in the second stage of EMU, and for "closely-correlated" currencies; no *de minimis* exemption; foreign currency options treated on a net delta valuation basis	Sets the capital charge under its basic approach at 8% of a bank's net open position; gold subject to the assessment procedures as well as foreign currencies; "dispensations" available under the CAD are not available; a *de minimis* exemption applies; a wide range of treatments for foreign currency options is available

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