OVERVIEW OF THE AMENDMENT TO THE CAPITAL ACCORD TO INCORPORATE MARKET RISKS[1] (January 1996)

1. In April 1995, the Basle Committee on Banking Supervision ("the Committee") issued for comment by banks and financial market participants a package of supervisory proposals for applying capital charges to the market risks incurred by banks, defined as the risk of losses in on- and off-balance-sheet positions arising from movements in market prices.[2] The principal paper in that set of proposals was a planned Supplement to the Basle Capital Accord of July 1988. The Committee has carefully considered the comments received and, with the endorsement of the G-10 central-bank Governors, is now reissuing the Supplement, suitably revised, in the form of an Amendment to the Capital Accord. The capital standards for market risk, as set forth in that Amendment, will be implemented by the G-10 supervisory authorities by year-end 1997 at the latest. Also being released is a companion paper describing the way in which G-10 supervisory authorities plan to use "backtesting" (i.e. ex-post comparisons between model results and actual performance) in conjunction with banks' internal risk measurement systems as a basis for applying capital charges.

2. The objective in introducing this significant amendment to the Capital Accord is to provide an explicit capital cushion for the price risks to which banks are exposed, particularly those arising from their trading activities. Introducing the discipline that capital requirements impose is seen as an important further step in strengthening the soundness and stability of the international banking system and of financial markets generally. Also part of the Amendment and underpinning this is a set of strict qualitative standards for the risk management process which apply to banks basing their capital requirements on the results of internal models. The Committee sees these qualitative standards as reinforcing the continued efforts within the supervisory community to achieve improvements in risk management techniques across the full range of financial market participants.

I. Summary of conclusions

3. The main feature of the April 1995 proposal was to respond to the industry's request to allow banks to use proprietary *in-house models* for measuring market risks as an alternative to a standardised measurement framework originally put forward in April 1993. In order to ensure a minimum degree of prudence, transparency and consistency of capital requirements across banks, the Committee proposed a number of quantitative and qualitative criteria for those banks which wish to use proprietary models. Section II below summarises

[1] This paper is a summary covering note for the two more detailed documents in the following chapters.

[2] The risks covered by the proposed framework were: (a) the risks in the trading book of debt and equity instruments and related off-balance-sheet contracts and (b) foreign exchange and commodities risk.

the comments received on this proposal and the reasons for the Committee's decisions regarding the quantitative criteria that will govern the use of proprietary models for determining capital charges. These require that "value-at-risk" be computed daily, using a 99th percentile, one-tailed confidence interval; that a minimum price shock equivalent to ten trading days (holding period) be used; and that the model incorporate a historical observation period of at least one year. The capital charge for a bank that uses a proprietary model will be the higher of:

- the previous day's value-at-risk;
- three times the average of the daily value-at-risk of the preceding sixty business days.

4. The quantitative and qualitative criteria for the use of internal models for capital purposes are presented in detail in Part B of the Amendment to the Accord. The *most significant change from the April 1995 proposal* is that banks will have more flexibility in specifying model parameters, including the possibility of recognising correlation effects across (as well as within) broad risk factor categories. Overall, the Committee has been inclined to take a conservative approach in its choice of parameters, and it reserves the right to modify the specifications required for banks using models as more experience is gained.

5. So far as the *standardised method* is concerned, the substance of the April 1995 proposal is largely unchanged, as described in Section III below. The standardised approach is presented in Part A of the Amendment to the Accord.

II. The use of internal models for supervisory purposes

6. The Committee received a variety of comments on the internal models approach of the April 1995 proposal. Commenters strongly welcomed the Committee's decision to include an internal models-based alternative in the market risk package. Commenters also strongly supported the qualitative criteria for the use of internal models as presented in the April proposal. The majority of critical comments therefore addressed the quantitative parameters of the consultative document. The main comments received in this area included:

- The multiplication factor was considered to be too high, possibly undermining incentives to use the models approach.
- There should be more flexibility built into the modelling parameters (e.g. the constraints on the method of recognising correlations and the dual observation period).
- More guidance was needed as to how the so-called "plus factor" would be implemented in practice.
- There should be recognition of the specific risk component captured by a bank's model. A number of commenters favoured the removal of the constraint considered in the April 1995 consultative document, which stated that the total

specific risk charge applied to debt securities or to equities could not be less than half the specific risk charges calculated according to the standardised approach.

7. The Committee has carefully reviewed these and the other comments received. It has concluded that the *overall approach of the April 1995 proposal remains appropriate*. In particular, it reaffirms the strict qualitative standards for the risk management process which will apply to banks that base their capital requirements on the results of internal models. However, in light of the comments received, the Committee has made some refinements to the quantitative parameters, and these are summarised below. The final language adopted by the Committee is presented in Part B of the Amendment to the Accord.

(a) Multiplication factor

8. As mentioned above, a significant number of respondents questioned the proposed multiplication factor. Some argued that banks' models measured risk with a high degree of precision and that a factor was therefore not necessary. The Committee accepts that banks' *internal models provide a valuable starting point* for measuring the riskiness of a bank's trading portfolio. However, this daily value-at-risk estimate then needs to be translated into a capital charge that provides a sufficient cushion for cumulative losses arising from adverse market conditions over an extended period of time. Many banks themselves employ relatively conservative assumptions for the purpose of allocating capital internally, including methods such as scaling up their value-at-risk estimate.

9. The multiplication factor is also designed to *account for potential weaknesses* in the modelling process. Such weaknesses exist because:

- Market price movements often display patterns (such as "fat tails") that differ from the statistical simplifications used in modelling (such as the assumption of a "normal distribution");
- The past is not always a good approximation of the future (for example volatilities and correlations can change abruptly);
- Value-at-risk estimates are typically based on end-of-day positions and generally do not take account of intra-day trading risk;
- Models cannot adequately capture event risk arising from exceptional market circumstances;
- Many models rely on simplifying assumptions to value the positions in the portfolio, particularly in the case of complex instruments such as options.

When seen in the context of the other quantitative parameters, the Committee has concluded that a multiplication factor of 3 provides an appropriate and reasonable level of capital coverage to address these prudential concerns.

(b) Additional flexibility in parameters

10. In reviewing the comments, the Committee has given careful consideration as to how best to *balance* the need to preserve the integrity and flexibility of banks' internal models against the need to ensure a minimum level of prudence, transparency, and consistency of the capital requirement across banks.

11. Against this background, the Committee has concluded that the costs of a dual *observation period*, on which banks were asked to comment in the consultative document, generally outweigh the potential benefits. However, the Committee has retained the minimum one year constraint on the length of the observation period. This constraint is straightforward to implement, and it strikes a reasonable balance between the relative advantages and disadvantages of a shorter and a longer observation period. The disadvantage of a shorter observation period is that it captures only recent market "shocks" and that it could lead to a very low measure of risk if it coincides with an unusually long stable period in the markets. Conversely, the disadvantage of a longer time horizon is that it does not respond rapidly to changes in market conditions. Tests conducted by the Committee suggest that a one year floor on the observation period can contribute significantly to reducing the variability in measured value-at-risk that may occur for a given set of positions across banks.

12. The Committee has also reviewed the question of how to address *different weighting schemes* for the observation period. It concludes that banks should have some flexibility in this area, subject to the constraint that the "effective" observation period be at least one year.

13. The Committee reaffirms the appropriateness of requiring banks to calculate value-at-risk based on an instantaneous shock equivalent to a *10-day move in prices (the holding period)*. While it would of course be possible to define different price shocks for different classes of instruments, the approach chosen by the Committee provides a straightforward method for addressing the risk that portfolio losses can build up over a period of time greater than a day. To limit industry burden, banks will be allowed to scale up or down their value-at-risk measure to arrive at the required 10-day holding period. Moreover, the Committee has decided to allow more flexibility than indicated in the April 1995 proposal in the treatment of instruments with non-linear risks. Thus, banks will be permitted to scale up their one day value-at-risk measure for options by the square root of ten for a certain period of time after the internal models approach takes effect at end-1997. They should, however, take additional steps to assess the risk in their portfolio over a large number of possible price movements applying, for example, Monte Carlo simulations and/or stress testing. Moreover, the ultimate standard for banks to achieve over time remains unchanged, namely the measurement of non-linearity through a 10-day price shock with full revaluation of positions, but with some flexibility as to the specific methodology to be used.

14. The Committee has reviewed the treatment proposed in the April 1995 consultative document, whereby banks could recognise *correlation effects* within broad risk

factor categories (i.e. interest rates, exchange rates, equity prices and commodity prices, including related options volatilities in each risk factor category), but would have to aggregate value-at-risk numbers across risk factor categories on a simple sum basis. After careful consideration, the Committee has concluded that it would be appropriate to permit a bank to recognise empirical correlations not only within broad risk factor categories, but also across risk factor categories, provided that the supervisory authority is satisfied the bank's system for measuring correlations is sound and implemented with integrity. In particular, as discussed in Part B of the Amendment to the Accord, banks should reassess their data sets whenever market prices are subject to material changes, and they must perform stress tests on the stability of correlations. Recognising correlations across risk factor categories should provide incentives for institutions to diversify their trading activities, thus reducing risk.

(c) The plus factor

15. In the April 1995 consultative document, the Committee announced its intention to add to the minimum multiplication factor a so-called *plus factor* based on the outcome of backtesting, that is, an ex-post comparison of the risk measure generated by the model against actual daily changes in portfolio value. Commenters generally welcomed the concept that there should be an incentive to construct models with good predictive quality, but called for more clarification about how this would be implemented in practice.

16. The criteria adopted by the Committee for defining the plus factor are presented in Section B.4 (j) of the Amendment to the Accord and in the document, *Supervisory Framework for the Use of "Backtesting" in Conjunction with the Internal Models Approach to Market Risk Capital Requirements*. If the backtesting results are satisfactory and the bank meets all of the qualitative standards set out in the Amendment to the Accord, the plus factor will be zero. The Committee believes that the approach adopted strikes a balance between recognition of the potential limitations of backtesting and the need to put in place a clear and consistent framework that contains incentives to ensure that banks model market risk with integrity. At the same time, the Committee recognises that the techniques for backtesting are still evolving, and it is committed to incorporating important new developments in this area into its framework.

(d) Treatment of specific risk

17. The capital framework for market risk is based on the so-called "building block" approach that separates general market risk arising from movements in broad risk factors from the *specific risk associated with individual securities positions*. The internal models approach was developed principally to provide an alternative to the general market risk component of the standardised approach. However, the April 1995 consultative document allowed some scope for the internal modelling of specific risk and invited comment on how the specific risk component was being or could be measured for capital purposes.

18. Industry comments indicate that banks' internal models may capture certain elements of specific risk, for example where each equity is modelled as an individual risk factor. However, it appears that other key elements of specific risk such as *event or default risk* are generally not captured by banks' internal models. Banks provided little evidence in the comment process that their models were capturing specific risk in respect of debt securities.

19. There is a willingness to give some recognition to banks whose models capture specific risk and to put in place incentives to further improve upon these methodologies. On the other hand, *there needs to be a prudential cushion* to address the concern that practice is still developing in this area and that an industry consensus has not yet emerged about how best to model certain elements of specific risk. The Committee has accordingly decided to retain the treatment proposed in the April 1995 consultative document, whereby a modelled treatment of specific risk would be allowed,[3] subject to an overall floor on the specific risk charge equal to 50% of the specific risk charge applicable under the standardised approach. Banks whose models take little or no account of specific risk will be subject to the full specific risk charges of the standardised approach. For example, banks with models that are limited to capturing movements in equity indices, or to the spread between the interbank or corporate yield curves and that on government securities, should expect to receive the full specific risk charges of the standardised approach.

20. Should the industry come forward with a *reasonable methodology* for measuring specific risk in the context of the internal models approach, the Committee is prepared to reconsider its approach in this area.

(e) Summary

21. The Committee notes that the use of proprietary in-house models to measure market risk for supervisory capital purposes represents a *significant innovation* in supervisory methods. Moreover, many internationally active banks are themselves in the process of gaining experience with the use of risk measurement and management techniques based on the value-at-risk approach. In order to gain additional information and comfort with the results produced by internal models, supervisory authorities reserve the right to require banks wishing to use internal models to perform testing exercises and to provide any other information necessary to check the validity of banks' models. All banks that wish to use models should therefore have the capability to evaluate a test portfolio.

III. The standardised methodology

22. Alongside the work on models, the Committee has also reviewed the proposed *standardised measurement method* that would establish market risk capital requirements for those banks not using the internal models approach. Since the April 1995 proposal in this

[3] This floor was subsequently removed in the statement of 19th September 1997.

regard was similar to the proposal circulated in April 1993, most comments focused on technical aspects. Part A of the attached Amendment to the Accord sets out the rules that the Committee has agreed for the standardised method.

23. The April 1995 proposal introduced specific capital charges to be applied: (i) to the current market value of open positions (including derivative positions) in interest rate related instruments and equities in banks' trading books, and (ii) to banks' total currency and commodities positions in respect of foreign exchange and commodities risk respectively. The proposals for interest rate related instruments and equities were based upon a *"building-block" approach* which differentiates requirements for specific risk (i.e. the risk of loss caused by an adverse price movement of a security due principally to factors related to the issuer of the security) from those for general market risk (i.e. the risk of loss arising from adverse changes in market prices).

24. For the most part, only minor changes have been made to the April 1995 proposal for the standardised method. In the section on interest rate risk, the Committee has provided more clarification as to so-called *pre-processing techniques*, which are intended for large swap books, and as to how these techniques are to be implemented. This is discussed in greater detail in Section A.1, paragraph 22, of the Amendment to the Accord.

25. The principal changes to the standardised methodology concern the section on *options*, where the April 1995 proposal has been simplified. The Committee is aware of the fact that many banks, particularly in respect of options, need an extended transition period to move to value-at-risk models. The "delta-plus method" and the "scenario" approach are intended to provide reasonable "stepping stones" to the full use of internal models. However, the Committee will keep these issues under review and plans to continue to monitor closely industry practice for measuring options risk.

IV. The definition of capital

26. The Committee confirms its April 1995 proposal to allow banks, at national discretion, to issue short-term subordinated debt subject to a lock-in clause (so-called "*tier 3 capital*") to meet a part of their market risks. Eligible capital will consist of shareholders' equity and retained earnings (tier 1 capital), supplementary capital (tier 2 capital) as defined in the 1988 Accord, and short-term subordinated debt (tier 3 capital).[4] Tier 3 capital will be subject to the following conditions:

- It should have an original maturity of at least two years and will be limited to 250% of the bank's tier 1 capital that is allocated to support market risk;
- It is only eligible to cover market risk, including foreign exchange risk and commodities risk;

[4] Long-term subordinated debt with a minimum original term to maturity of over five years will continue to be part of tier 2 capital.

- Insofar as the overall limits in the 1988 Accord are not breached, tier 2 elements may be substituted for tier 3 up to the same limit of 250%;
- It is subject to a "lock-in" provision which stipulates that neither interest nor principal may be paid if such payment means that the bank's overall capital would then amount to less than its minimum capital requirement.

In addition, a significant number of member countries are of the opinion that the principle in the present Accord that tier 1 capital calculated on a consolidated basis should represent at least half of total eligible capital should be retained, i.e. the sum total of tier 2 plus tier 3 may not exceed total tier 1. However, the Committee has decided that any decision whether or not to apply such a cap on the use of tier 3 capital should be a matter for national discretion. All countries will continue to maintain the principle that total eligible tier 2 is limited to a maximum of 100% of the total tier 1 elements.

27. In calculating a bank's overall capital ratio, an explicit numerical link between credit and market risk will be created by multiplying the measure of market risk by 12.5 (i.e. the reciprocal of the minimum capital ratio of 8%) and adding the resulting figure to the sum of risk-weighted assets compiled for credit risk purposes. The numerator of the calculation will be the whole of the banks' tier 1 capital, its tier 2 capital under the limits imposed in the 1988 Accord, plus (at national discretion) those tier 3 capital elements which can be used to support market risks. Unused but eligible tier 3 capital may be reported separately.

V. Other issues relating to the operation of capital requirements for market risks

28. Banks using their internal models will be required to have an integrated risk measurement system that captures all their market risks. This means in principle that, for a given risk factor category, the risk must be measured using a single approach (i.e. using either internal models or the standardised approach) for that risk category. Those progressing towards comprehensive models will be permitted on a transitional basis to use a *mixture of models and the standardised measurement method* for each separate risk factor category (exchange rates, interest rates, equity prices and commodity prices, including related options[5] volatilities in each risk factor category). However, the use of such partial models will be subject to supervisory approval and the Committee plans to review this treatment in due course. Having adopted an internal model for one or more risk factor categories, a bank will not be permitted, save in exceptional circumstances, to revert to the standardised approach. All elements of market risk that are not captured by an internal model will remain subject to the standardised measurement framework.

29. While favouring capital requirements over *position limits* as the appropriate instrument for international convergence in the treatment of market risk, the Committee

[5] Banks using the standardised measurement system would, however, be permitted to use scenario analysis covering all their options positions and the related underlyings.

continues to believe that limits can have an appropriate place in national supervisory arrangements. Individual national supervisors will therefore maintain limits where they judge it appropriate to do so, both as a means of imposing absolute ceilings on banks' exposures and of reinforcing internal controls. For example, supervisors who use limits to restrain position-taking in foreign exchange markets would be free to continue to use limits in conjunction with the proposed capital requirements on open positions, whether that is done through models or the standardised measurement system.

30. Whether banks use models or not, it is important to note that capital requirements for *counterparty credit risk* with respect to derivative products will continue to apply under the terms of the 1988 Capital Accord, as modified by subsequent amendments. Additionally, in the same way as for credit risk, the capital requirements for market risk are to apply on a *worldwide consolidated basis*.

VI. Cooperation with other supervisory authorities

31. It has been a long-standing objective of the Basle Committee to achieve *more consistent regulatory treatment* where different types of institutions engage in similar types of activities. In this respect the Committee has maintained close ties with the Technical Committee of the International Organisation of Securities Commissions (IOSCO). In July 1994, the two Committees issued parallel papers containing guidelines for the risk management of derivatives activities. In May 1995, the Basle Committee and the IOSCO Technical Committee issued a joint framework for the reporting of derivatives-related information to supervisory authorities (as well as related on-balance-sheet positions). More recently, the two Committees have released a joint paper with recommendations for the disclosure of information on the trading and derivatives activities of banks and securities firms. All of these initiatives have placed significant emphasis on an improved and more consistent supervisory approach to market risks.

32. Further to the Halifax Summit of G-7 countries, the two Committees are in close contact on a number of other important issues. The Basle Committee will make every effort to ensure that this joint work is carried forward with positive results. In the area of market risk capital, the Committee is working with the IOSCO Technical Committee to better understand the relative implications of value-at-risk models for banks and securities firms and the extent to which there is scope for further collaboration in this area.