The Amendment to the Capital Accord to Incorporate Market Risk

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Introduction

As foreshadowed in my earlier paper (Hall 1995), the Basle Committee on Banking Supervision has now published, in the form of an Amendment to the famous Capital Accord of 1998 (see Hall 1989), its definitive statement on how the capital adequacy assessment of internationally-active banks should be amended to take account of the market risks, as well as the credit risks, to which banks are exposed (Basle Committee 1996a). The new assessment regime has to be implemented by the G10 supervisory authorities by the end of 1997 at the latest. The purpose of this article is to explain the major changes made by the Basle Committee to its previous set of proposals (Basle Committee 1995) which were outlined in Hall (1995).

Market reaction to the Basle Committee's consultative proposals of April 1995

During the consultation period, the Basle Committee received a number of representations from market participants concerning its

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proposals for dealing with market risk. The major criticisms related to the proposed *quantitative standards* which banks intending to use proprietary internal models for measuring market risks and generating associated capital charges would have to satisfy. They can be summarised as follows:

(i) the minimum "*multiplication factor*"[1] of 3, designed to take account of extreme market conditions, is too high;

(ii) the recommend use of a further "*plus factor*",[2] designed to improve the predictive quality of the model, is unnecessary;[3,4]

(iii) the generic parameters proposed for the use of internal models are too restrictive;

(iv) not enough allowance for diversification within trading portfolios is given; and

(v) greater recognition should be given to the *specific risk* component captured by a bank's model.[5] The general conclusion reached by the majority of respondents was that the Committee was being too cautious which had resulted in its proposals being too conservative and responsible for generating excessively high capital charges.

[1] For banks using internal models, the capital charge is to be computed as the higher of the previous day's "value at risk" and an average of the daily "value at risk" on each of the preceding sixty business days, multiplied by the multiplication factor.

[2] When translating a daily "value-at-risk" estimate into a capital charge, the multiplication factor is subject to a "plus", the scale of which is directly related to the *ex post* performance of the model.

[3] The combined use of the proposed multiplication factor and the plus factor threatens to undermine the incentives for using the models-based approach, as many firms claim that the capital charges so generated would exceed those deriving from the application of the alternative *standardised* approach. Accordingly, they argued, the proposals reduced the incentive to develop good risk management procedures and also provided banks with an incentive to understate their values-at-risk (VARs).

[4] Many respondents also sought further guidance on how to implement the plus factor in practice.

[5] Some respondents argued for the removal of the constraint proposed in the 1995 document which meant 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.

The Basle Committee's response to the representations received

Following careful deliberation of the representations received during the consultation period, the Basle Committee concluded that the overall approach recommended for adoption in its April 1995 paper remained appropriate. In particular, it re-affirmed the strict *qualitative standards* for the risk management process which banks adopting a models-based approach to generating capital charges will have to meet; it confirmed its earlier proposals concerning the *mixed use of internal models and standardised approaches*; it confirmed its proposed approach to *defining capital* for regulatory purposes and to *calculating the capital ratio* and the *overall minimum capital requirement*; and, finally, it left largely unchanged its proposals for the *standardised methodology* to be employed to calculate market risk capital charges by those banks not using internal models (see Hall 1995).[6] Moreover, for the reasons given below, it refused to give ground on the subjects of the "multiplication factor", the "plus factor", and the specific risk capital charges for those banks using models. It did, however, accept the case for allowing greater flexibility in the specification of model parameters and for giving greater recognition to diversified portfolios. These issues are addressed in the next section.

In rejecting the industry's case for a reduction in the scale of the proposed minimum *multiplication factor*, the Committee highlighted the need, when translating a daily value-at-risk estimate into a capital charge, to provide a sufficient cushion to provide protection against potential cumulative losses arising from adverse market conditions extending over a prolonged period of time. Moreover, they argued that a conservative factor is necessary to account for the potential weaknesses of the modelling process.[7] In the light of these prudential

[6] The major changes made relate to the treatment of *options*, where the April 1995 proposal has now been simplified (see Basle Committee 1996a, Section A.5, for full details). The Committee has also clarified its approach to the use of *pre-processing techniques*, which are intended for large swap books, within the calculation of capital charges to cover the interest rate risk arising from positions taken in derivatives (for further details see Basle Committee 1996a, Section A.1, para. 22).

[7] "Weaknesses" can arise because of the following: market price movements often display patterns that differ from the statistical assumptions (e.g. of a "normal distribution") employed within the models; the past is not always a good guide to the future (e.g. volatilities and correlations can change abruptly); value-at-risk estimates are typically

concerns, the Committee concluded that a minimum multiplication factor of 3 was both "appropriate and reasonable".

Although rejecting the plea for abolition of the proposed "*plus factor*", on the grounds that there should be an incentive for banks to construct models with good predictive quality, the Committee did clarify the circumstances in which a plus factor of zero would be acceptable, namely when "backtesting" results[8] are satisfactory and the bank satisfies all of the prescribed qualitative standards. The Committee argues that its approach "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".

Finally, on the *treatment of specific risk* for those banks using internal models, the Committee held out against giving greater recognition to the capture of specific risk by models on the grounds that, even where each equity is modelled as an individual risk factor, key elements of specific risk, such as event or default risk, are rarely captured. Moreover, in respect of debt securities, the Committee argued that banks had provided very little evidence that their models were capturing specific risk. Accordingly, and notwithstanding its willingness to give some recognition to banks whose models capture specific risk and to put in place incentives to further improve upon these methodologies, the Committee decided to confirm the treatment of specific risk proposed in its April 1995 document – whereby a modelled treatment of specific risk would be allowed subject to an overall floor on the specific risk capital charge equal to 50 per cent of the specific risk charge applicable under the standardised approach – in order to provide a prudential cushion to address the concern that industry practice is still evolving in this area, with no consensus yet emerging about how to model certain elements of specific risk.

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; too many models rely on simplifying assumptions to value the positions in the portfolio, particularly in the case of complex instruments such as options.

[8] A companion paper, describing the way in which G10 supervisory authorities plan to use "backtesting" (e.g. *ex post* comparisons between model results and actual performance) in conjunction with banks' internal risk measurement systems as a basis for applying capital charges, was published alongside the "Amendment to the Capital Accord" in January 1996 (Basle Committee 1996b).

The change made by the Basle Committee to its 1995 market risk paper

As noted above, the major changes made by the Committee, by way of concessions to the banking industry following representations, to their original set of proposals relate to the greater flexibility allowed banks in respect of their specification of model parameters and to the greater recognition of diversification. Each of these issues will now be addressed in turn.

Although confirming that the bulk of the quantitative criteria governing the use of proprietary models for determining capital charges, outlined in the 1995 paper, will stand – namely 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 be used; that the model incorporate a historical observation period of at least one year; and that the capital charge be computed as the higher of the previous day's value-at-risk and three times the average of the daily value-at-risk of the preceding 60 business days – the Committee decided that some greater flexibility in the specification of model parameters was in order. Firstly, the Committee dropped its proposal for a *dual observation period*, on the grounds that the "costs ... generally outweigh the potential benefits". (The minimum one-year constraint on the length of the observation period was confirmed, however.) Secondly, after reviewing the question of how to address *different weighting schemes* for the observation period, the Committee concluded that banks should have some flexibility in this area, subject to the constraint that the "effective" observation period be at least one year. And, thirdly, although requiring banks to calculate value-at-risk on an instantaneous shock equivalent to a ten-day movement in prices (the *holding period*), banks will be allowed to scale up or down their value-at-risk measure to arrive at the required ten-day holding period, in order to limit their compliance burden. Moreover, more flexibility than initially envisaged will be allowed in the treatment of *non-linear risks*.[9]

[9] For example, banks will be allowed 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 initial models approach takes effect at end-1997. They will, however, have to take additional steps to

Finally, in respect of the allowance given for *diversification* within trading portfolios, the Committee 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 that the bank's system for measuring correlations is sound and implemented with integrity.[10] Such a development is viewed as desirable because it provides banks with incentives to diversify their trading activities, thereby reducing risk.

Concluding comments

The recent publication of the Basle Committee's definitive statement on how to accommodate market risk within the capital adequacy assessment of internationally active banks confirmed the Committee's willingness to listen to reasoned argument about its proposals. The amendments embraced in the final document are a welcome concession to the banking industry even though, mainly for sound prudential reasons, they do not go as far as some market participants would like. Moreover, we now know where the (non-European Union) G10 region is heading in respect of the regulation of market risk, a development which should serve to stimulate debate within those alternative fora (e.g. the European Union and the International Organisation for Securities Commissions) directly concerned with the harmonisation of regulatory treatment across national and/or industry frontiers.

assess risk in their portfolios 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 will remain the measurement of non-linearity through a ten-day price shock with full revaluations of positions but with some flexibility as to the specific methodology to be used.

[10] In particular, 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.

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