SUMMARY OF RESPONSES RECEIVED ON THE REPORT "CREDIT RISK MODELLING: CURRENT PRACTICES AND APPLICATIONS"

Basel Committee on Banking Supervision

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Models Task Force

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Background

In April 1999, The Basel Committee on Banking Supervision published a report, prepared by the Basel Models Task Force, entitled "Credit Risk Modelling: Current Practices and Applications". This report analysed current practices and issues in credit risk modelling and assessed the potential use of credit risk models for supervisory and regulatory purposes. The report concluded that "credit risk modelling may indeed prove to result in better internal risk management, and may have the potential to be used in the supervisory oversight of banking organisations. However, before a portfolio modelling approach could be used in the formal process of setting regulatory capital requirements for credit risk, regulators would have to be confident not only that models are being used to actively manage risk, but also that they are conceptually sound, empirically validated and produce capital requirements that are comparable across institutions. At this time, significant hurdles, principally concerning data availability and model validation, still need to be cleared before these objectives can be met, and the Committee sees difficulties in overcoming these hurdles in the timescale envisaged for amending the Capital Accord."

The report went on to set out current practice in credit risk modelling, based on a survey of 20 large international banks in 10 countries. Technical aspects of modelling were examined and the modelling issues that they raised were discussed. Comments from interested parties were sought by 1 October 1999.

The responses

Twenty-two responses were received. Three were received from non-G-10 banking regulators, nine from individual banks or industry associations, five from academics or academic organisations and five from representatives of the consulting, accounting or risk management professions. The Models Task Force held discussions with two of the main industry associations in October 1999.

The Committee is grateful to all those who responded. The Committee values the comments made and the interest shown in the report. The responses acknowledged that the report addressed the relevant issues in a serious and balanced manner. The respondents were supportive of the argument that data shortages made parameter estimation difficult, particularly estimates of the tails of distributions, correlations, and loss given default.

Not all of the responses agreed with all the judgements within the report, however. The chief issues on which respondents challenged the report were on validation, where some respondents felt that the Committee was searching for a market risk-style backtesting framework, and on comparability of outputs, where some respondents took the report to indicate a wish for uniformity of outputs and argued that this was neither achievable nor desirable.

Many technical insights and comments were received on the report. In addition, some respondents submitted descriptions of modelling activity in their own domains, and some provided papers and original research that addressed general credit modelling issues. Regrettably, this summary cannot reflect all the comments received; accordingly, the summary focuses on responses that comment directly on the report.

The purpose of the report was to facilitate debate and discuss the issues surrounding credit risk modelling, and not to provide proposals for a capital regime. Since details of a portfolio models-based capital regime are not presently under active consideration, the Committee does not wish to react in detail to comments made.

At this stage, the Committee wishes to note that a robust validation process will be needed to ensure the integrity of any future internal model based regime; the Committee is open minded as to the form of validation. On the need for comparability of outputs, the Committee has noted the points made by respondents, but notes that a capital regime will need to provide a level playing field for capital requirements in banking organisations.

There have been a number of subsequent developments since the report was issued. Chief among these from the Committee's point of view was the issuance of a consultative paper entitled "A New Capital Adequacy Framework" in June 1999. Inter alia, the consultative paper proposed making use of banks' internal credit rating systems, an important input to many forms of credit risk model, and the Models Task Force is currently engaged in significant work in developing options for an internal ratings based approach to minimum capital requirements. The consultative paper did, however, make reference to credit risk modelling in the light of April's report, saying that the Committee hoped the outputs of such models could at some future time be used as a basis for setting regulatory capital requirements. In addition, the industry has co-operated with the Committee on empirical work related to the development of an internal ratings-based approach. Moreover, new material on the subject of models continues to be published: a recent example is a joint IIF/ISDA study entitled "Modelling Credit Risk" (February 2000). The Committee expects that its work on internal ratings and the associated work in co-operation with the industry will help pave the way for a future models based approach to credit risk capital requirements.

The remainder of this note is devoted to a summary of the responses received on the April report on credit risk modelling. The organisation of this note largely reflects the organisation of the original report.

Overview of Conceptual Approaches to Credit Risk Modelling

On the definition of a credit risk model, respondents noted that no one model type was suitable across all portfolio: techniques used in measuring the credit risk inherent in corporate loan portfolios, trading and derivatives portfolios and in retail portfolios might be different from each other. One response noted that a definition of VaR-style credit risk model (namely one aimed at generating confidence intervals of density functions) was a narrow definition. An eclectic approach to modelling should be permitted, in particular models based on scenarios or other techniques should be seen as acceptable types of model.

On the definition of loss, the report discussed two main types of definition: default-mode (DM) and mark-to market (MTM). Responses were divided in their opinion: some argued that both types of definition could lead to acceptable models, and moreover that there should not be an ex-ante preference on the part of the Committee that marking assets to market (or to fair value) in the banking book should be a precondition to using models in setting credit risk capital requirements. Others argued that the MTM approach was a superior definition in that it was the more accurate and sound method for measuring potential losses.

On the choice of time horizon, there were no strong views expressed. Respondents felt that the choice of horizon depended on whether the model was intended to measure risk of loss under a liquidation scenario or over a time period over which mitigating action could be taken. One year was felt to be appropriate for the latter by most respondents. One respondent suggested that the choice of time horizon may need to be decided with reference to the financial practices and market conditions prevailing within individual countries.

On loss given default, respondents generally agreed that data was a hindrance to accurate estimation, although some felt that there was sufficient data on US and European credits.

On the shape of the density function, responses accepted the report's observation that there were no standard functional forms for the loss distribution and that the tails of distributions were inherently difficult to measure. However, respondents argued that this was not a barrier to successful modelling.

On the choice between models that are conditional on the state of the economy or unconditional, a few comments were received on this point. One response felt that credit models needed to be combined with macroeconomic forecasts, given the dependency of credit losses on the economic environment, while others felt that conditional models were appropriate only if there was a sound empirical linkage. One response noted that good risk management practice meant models or their parameters might require adjustment in the event of adverse economic conditions.

As a general comment, one respondent noted that more sophisticated modelling techniques did not necessarily result in more successful models; simple models could be useful.

Parameter Specification and Estimation

There was agreement that data issues were a significant challenge for modelling activity. Responses drew attention to the fact that data availability was good in some areas, e.g. on US corporate bonds. One respondent pointed out that the legitimate questions concerning data availability should not be taken to mean that data sets used in the parameterisation credit risk models needed to be of similar quality as those used in the market risk arena.

Some responses argued that data deficiencies occurred because of the absence of data distribution channels and incentives. Data deficiency could be overcome through the use of data proxies and through the making of conservative assumptions.

One response argued that continued development of credit modelling would itself provide a spur to better data collection, both by banks themselves, but also by encouraging data vendors to facilitate bank-to-bank data distribution. A suggestion made by a few respondents was that some sort of data-pooling could ameliorate data deficiencies and one response suggested that a public data warehouse should be introduced, with data supplied by each bank within a given region. One respondent suggested that regulators were well placed to promote data availability, such as producing standardised data definitions.

Some international respondents reflected a concern that model parameters might be derived from US data and thus might be insensitive to patterns of credit risk present in regional economies. These respondents gave examples of institutional idiosyncrasies in individual countries or regions that were not well reflected in commercially available credit modelling packages.

Validation

Respondents agreed that validation of models was an important factor in moving to their use in regulatory applications. There was also agreement with the Committee's view that market risk style backtesting did not transfer easily to credit risk models. Such a backtesting standard was seen as neither practical nor methodologically feasible. These respondents pointed out that insufficient data existed to undertake this form of validation; moreover, the length of runs required for a satisfactory test would include historical data that was inappropriate to the modern-day financial industry.

Some responses included practical suggestions on validation methods, summarised as follows.

One approach suggested by a number of respondents was reliance on sensitivity analysis and stress-testing. It was felt that sensitivity analysis could contribute insight into the model's performance in response to incremental changes in key parameters and quantitative assumptions; it could demonstrate that model outputs responded in a directionally intuitive fashion in response to changes in inputs and could be a key diagnostic tool in validation work. Stress testing could help demonstrate of a model's internal consistency, as well as demonstrate the model's performance under conditions of extreme events (although a limitation was that application of a stress event might take a model outside the range within which it was designed to operate). Respondents agreed that stress testing should form part of sound risk management practice regardless of its use in validating models for regulatory purposes.

Another suggested method was the use of test portfolios or the use of panel data or test portfolios (perhaps randomly selected) in addition to broader measures of historical loss experience. One response suggested that supervisors and banks could work together to undertake a series of quantitative exercises to test various credit risk models.

Respondents emphasised the need to take account of the context within which models were being used when assessing them, since model construction and operation could vary significantly depending on the portfolio typically held by the bank and the choice of loss definition. One respondent argued that a model was a tool designed to assist the modeller in making estimate of credit risk; on this view, validation work should include not just the model but also the way in which the model is used to measure risk.

Some responses discussed methods of internal model validation: these pointed to the need for comprehensive documentation of models and the need for independent review of models within organisations as part of a satisfactory validation process.

Supervisory and regulatory application of models

Most responses acknowledged that the Committee had taken a significant step in looking at models and considering them for use in regulatory capital requirements. It was noted that an advantage would be that, if models were to be used in setting capital requirement, banks would not need to maintain costly dual risk measurement systems for regulatory and internal purposes.

A number of responses noted a possible role for the regulatory community in providing guidance for the industry on good practice and minimum standards and in fostering the use of models generally. It was felt that this was important in order to stimulate development of, and

improvements in, risk management as well as to avoid tension caused by differing regulatory and internal measures of credit risk. The Committee was looked to for leadership, co-ordination and information sharing.

One response expressed caution over using models in setting capital requirements, arguing that, for institutions with a good history of relationship lending, a model was an inferior tool of comparative risk assessment.

Some respondents suggested that models be recognised or approved on a portfolio by portfolio basis. It was claimed that this would be in line with the fact that banks implement models gradually, as they gain confidence in the model and in the data used to support it. In this way, it was argued, banks would have an incentive to implement models across broad portions of their business in a timely manner. If, conversely, regulators required complete coverage of a model before considering it for recognition, then the incentives would be likely to lead to delay in the modelling process and consequently prove counterproductive.

On internal use of models, respondents were in strong agreement that models should be used internally for risk management purposes or some other internal application if they were to be considered for use in setting capital requirements. Caution was expressed that this should not result in regulators requiring regulatory models to be used for internal purposes. One respondent argued that the test should be whether models helped to improve the efficiency of business and accuracy of risk analysis; to this end they suggested as a test of internal use that models should fulfil two out of three internal functions: economic capital, concentration/exposure limits and assessing risk-adjusted capital.

Several responses picked up on the Committee's desire that the output of models should be comparable across institutions. Respondents stated that a definition of comparability that required model differences to be "explained", or related to parameter differences or model differences, was acceptable to the industry. However, if "comparable" meant that the Committee wished to see standardisation or uniformity among models, this was seen as undesirable and unrealistic. Arguments included the need to foster innovation and diversity, the need for competition between financial institutions in risk measurement technique, and the need to avoid requiring banks to use regulatory models for internal purposes. Encouragement of standardisation of model output might foster manipulation of data or model assumptions in a way that reduced the value of regulatory reliance on internal models.

Some respondents expressed the hope that, until such time as a full portfolio models approach to credit risk capital requirements was adopted, institutions that continue to invest in credit risk modelling to improve their risk management practices should be provided with incentives in the form of regulatory relief under the proposed supervisory review pillar of the revised capital accord ("Pillar 2"). Regulatory relief should be commensurate with an institution's level of progress in migrating towards industry best practices. This would incentivise banks to invest in modelling; moreover, by ensuring that active credit risk management practices develop, the availability of data needed to run and parameterise the models would be improved.