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27th May 2010

Sent by e-mail to baselcommittee@bis.org

Joint trade associations' response to the Basel Committee on Banking Supervision

Consultative document *Sound practices for backtesting counterparty credit risk models*

Dear Governor Wellink

The International Swaps and Derivatives Association ("ISDA") and the Association for Financial Markets in Europe ("AFME") are pleased to respond to the consultative document *Sound practices for backtesting counterparty credit risk models*.

Introduction

Our members share the Basel Committee's goal of enhancing the regulatory framework, and support the Committee's efforts to elucidate best practices in counterparty credit risk modelling. The document contains much that the industry supports and commends. However we believe that several of the practices as currently outlined are either not feasible, not likely to lead to statistically significant results, or do not add sufficient value to justify their inclusion as outlined below.

There is also a wider point: risk governance and organisation are the responsibility of firms, and are reviewed by supervisors under Pillar 2. There is some concern that the Committee is seeking to define firm's practices here rather than simply to disseminate good practices which firms may choose to implement depending on their business model and the materiality of the risks concerned. If so, many of the recommendations have little or no benefit for many or all firms as well as being complex to implement.

In what follows we use the shorthand **point *n*** for the guidance immediately following the paragraph numbered *n*.

Guidance which cannot be implemented

One of the associations' major concerns with the Guidance in the document concerns **point 40, *Time Horizons***. It reads 'Firms must validate their EPE models and all relevant models that input into the calculation of EPE out to time horizons commensurate with the maturity of trade covered by the IMM waiver'. Given that many firms have swaps of maturity 30 years or more, this guidance is impractical:

- First, data is not available for many risk factors for more than ten years; and for some risk factors, the length of data series is even shorter. This is especially true in the structured credit markets.
- Second, even if data were available for longer periods, it relates to a fundamentally different economy, and hence may be of limited utility.
- Third, regulatory capital is mainly driven by shorter time horizons.
- Finally, in order to obtain statistical significance over the whole life of a transaction, not only would data to the maximum maturity be needed, but also for rather longer, in order to give a sufficiently large number of intervals.

Therefore we recommend that the guidance is rephrased as

'Firms must validate their EPE models and all relevant models that input into the calculation of EPE out to sufficiently long time horizons given the data available to provide statistically significant results for their portfolio. This should be a minimum of one year.'

Note too that **point 27** appears to be in contradiction to point 40: recent performance will be overwhelmed by much older results for long-dated transactions if 40 is followed. We would recommend instead the use of a longer interval where data is available, with testing also taking place at a shorter subinterval reflecting recent conditions, taking into account the materially reduced statistical significance. The specifics here vary from market to market and the desired degree of statistical significance, so if general cross market guidance is sought, then we would recommend a maximum one year horizon.

Guidance which may hinder effective backtesting

There are a number of areas where the guidance provided is vague and where the cost of compliance may be far in excess of the benefit. For instance the guidance after **point 8** refers to 'the entire forecast distribution'. However, that requirement, while useful for some kinds of backtesting tests, may well be misleading or irrelevant in other contexts. A general requirement to test forecast distributions without regard to context may lead to test results that are less clear

and thus less likely to improve models. Good tests of models should clearly and specifically assess whether models are achieving the purpose for which they are constructed. If a test is well-designed, then its failure should make clear how the model should be adjusted. A good test will lead to actionable results. Therefore it is key that firms have the freedom to design backtests so that they are both rigorous tests of the estimation for their portfolios, and so that failure indicates what investigation is necessary and what changes, if any, should be made. This point is further clarified in the Appendix.

The proposed language of **point 22** would require that risk factors be tested separately. However, the backtest is a test of the hypothesis that the capital estimated as necessary is accurate. This involves the hypothesis that the risk factor simulation is suitable when combined with the pricing models used. The failure of one part here does not imply a failure of the conjunction. Therefore a general requirement to do risk factor backtesting is superfluous to a well-designed backtesting process: indeed, this process can create false negatives. Instead, as **point 31** stresses, firms should have a clear definition of the criteria for successful backtesting, and for successful performance more generally. It is important that guidance is not too prescriptive here, as failing a backtest does not necessarily indicate model problems. Rather, it is beginning of an investigative process which is guided by the firm's backtesting policy.

In **Point 24**, we would make the distinction between

1. The frequency at which backtests are run;
2. The frequency at which backtests are reviewed for capital purposes; and
3. The frequency at which backtests are reviewed for model validation purposes.

We suggest that firms should be free to pick the first as part of their internal risk governance decision, that the second should be quarterly, and the third annually. Decoupling the second and the third issues is important as it allows for a comprehensive model validation process while ensuring that capital-related backtesting occurs with an appropriate frequency.

Point 29 is slightly unclear to us: we would suggest that firms table this issue as part of their annual model review process.

Point 34 suggests that best practice requires the use of hypothetical portfolios. While some benefits can be obtained here, it is important that these portfolios represent plausible risks that the firm might have, rather than an arbitrary collection of risk divorced from the firm's business strategy. If firms backtest both EPE and risk factors for the actual portfolios on an ongoing basis, we do not necessarily see the need to introduce hypothetical portfolios, especially if these are divorced from the risks which the firm has, or plans to have.

The use of time horizons of more than one year only provides statistical significance if overlapping windows are used, which in turn complicates matters as autocorrelation is introduced. Nevertheless **points 39 and 40** will require them. The guidance elsewhere is equivocal on this point however, suggesting (**point 7**) that 'overlapping data windows *can* be used'. We would request clarity as to exactly what is proposed here, and why. The presence of autocorrelation means that the use of overlapping windows does not necessarily increase statistical significance very quickly as the total sample size increases, and there are as we have pointed out above significant issues with the availability and applicability of data.

Regarding non-simulation models, we think that it is important to distinguish between models which are truly an approximation, and so where the guidance in **point 42** is appropriate, and

other non-simulation models which are nevertheless highly accurate, such as analytic approaches calibrated to current market data.

Finally, we would stress the difference between the standards appropriate for collateralised and for uncollateralised portfolios. We would suggest that the Committee clearly differentiates standards applicable to the two different types of portfolio.

Comments and Questions

If you have any comments or questions regarding this response, or require further information, please contact David Murphy (dmurphy@ISDA.org).

Yours sincerely,



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Appendix

Consider the Black-Scholes model to price options. This formula is derived under the assumption that asset prices follow geometric Brownian motion, implying that volatility is known and constant. A test that compares the theoretical option pricing distribution to the empirical distribution would be a poor test of the model. That test will likely fail, since volatility is time-varying and stochastic, but the test's failure will not help to decide whether the model prices options adequately. A better test might for instance examine whether Black Scholes as used in practice (with time-varying volatility) produces hedging errors that are too large. Failure of such a test would imply that the model is inadequate for its intended purpose and would require remediation. The failure of a forecast distribution test, on the other hand, will not clarify whether model improvements are necessary.

A forecast distribution test would also be unsuitable for cases where a firm has decided to make certain percentiles of the forecast distribution of an EPE model more conservative or has attempted to adjust the distribution for wrong way risk. In both cases, the model has been explicitly designed to be inconsistent with the empirical distribution and alternative tests should be designed.

Similarly, the stressed EEPE model proposed by the Basel committee is designed to insure that capital is adequate even under very stressed economic conditions by using a calibration more appropriate for a financial crisis. But in doing so, the model would be likely to fail a statistical forecast distribution test. If that test failed, it would say nothing about whether the model's performance is adequate for the purpose of conservatively estimating capital.

Even in simpler cases, a forecast distribution test may be misleading. EPE models are generally designed to predict a particular percentile of the distribution well for risk management purposes and to estimate expected exposure well for capital purposes. EPE models, being approximations to reality, are not necessarily designed to predict each percentile of the distribution equally well. Nonetheless, these models may well be adequate for their intended purpose. Tests that examine specifically whether the models can predict specific percentiles or expected exposure could be more useful than more general forecast distribution tests.

Forecast distribution tests may be entirely appropriate. For example, if a firm were testing a large number of hypothetical or real counterparties simultaneously, then a forecast distribution test could be very useful in aggregating statistical information.

At present, backtesting methodology is an unsettled discipline. There is a limited academic literature on counterparty credit risk backtesting and no consensus on the most effective methodologies. It is therefore premature to set down a specific requirement such as a forecast distribution test. Rather, firms should be free to develop methodologies that may well include forecast distribution tests or some variants. Firms should not be required to incorporate any specific tests until there is more consensus on which tests are most useful and applicable. Instead, at this stage, it seems more appropriate to set down general backtesting requirements:

1. The purposes for which EPE model are designed should be documented;
2. The backtesting methodology should include clear and unambiguous tests that will assess whether the models do achieve their intended purposes; and
3. Failure of the tests should lead to investigation with a view to determining if improvements in models are necessary. However it should be up to individual firms to specify the details of those tests.