
Secretariat of the Basel Committee on Banking Supervision
Bank for International Settlements
CH-4002 Basel
Switzerland

16 April 2010

Dear Committee Members,

“Strengthening the Resilience of the Banking Sector – Consultative Document”

The Goldman Sachs Group, Inc. (“Goldman Sachs”) is pleased to provide comments on the consultative document entitled “Strengthening the Resilience of the Banking Sector”¹.

In light of the recent financial crisis, there is a clear need for globally co-ordinated reforms to address weaknesses in the financial system, and we would like to express our appreciation of the efforts that have been made by the Basel Committee on Banking Supervision (“the Committee”) to contribute these proposals.

Goldman Sachs has long supported the need for “higher and more rigorous capital and liquidity standards that recognise the compelling reality that managing and supervising capital adequacy and liquidity adequacy must be viewed as a single discipline²”, and we therefore support the overall objectives of the Committee’s proposals.

As a very general matter, we would note the following:

- firstly, the overwhelming majority of losses and writedowns during the crisis were directly and indirectly an outgrowth of shortcomings in the credit origination and lending process, an area that the consultative document does not address;

¹ Please note that we are separately responding to the consultative document “International framework for liquidity risk measurement, standards and monitoring”.

² Statement of E. Gerald Corrigan before the Committee on Banking, Housing and Urban Affairs of the United States Senate and before the UK Treasury Select Committee, both in February 2010

- secondly, while we enthusiastically support the case for more rigorous capital standards, there is a risk (however small) that higher capital requirements could actually impede the credit intermediation process as a whole;
- finally, the proposals in the consultative document are understandably exceedingly complex, particularly in the U.S. context, where they are being superimposed on the implementation of Basel II; therefore, we strongly believe that the process as a whole must be approached with great care, in a setting in which all participants recognize that the administration of such proposals must have a distinct, case-by-case philosophy, as opposed to a “one size fits all” philosophical overlay.

With regard to the consultative document, we are very concerned that, in its current form, it could have negative implications for the wider economy, especially when taken together with the market risk reforms published in July 2009 and the liquidity proposals of December 2009. We consider there to be a real possibility that these changes would reduce the availability of credit and liquidity in the global economy and that this could have profoundly important implications for the nascent economic recovery, and possibly serious economic implications in the medium and longer-term. Further, we believe that the proposals will disproportionately impact certain activities that were not the source of the majority of the losses incurred during the financial crisis.

In view of the gravity of this potential impact, we strongly urge the Committee not to implement these proposals until such time as:

- a) a detailed evaluation of the macro-economic impact has been completed; and
- b) the results of the quantitative impact study have been fully analyzed and compared to an assessment of losses incurred during the financial crisis, to ensure that the proposals are appropriately targeting the causes of the crisis.

We have summarized below some of the more important concerns we have with the Committee's proposals and have included more detailed comments in the attached appendix.

Leverage Ratio

We do not consider a leverage ratio to be a meaningful measure of risk or of capital adequacy. For example, the leverage ratio does not differentiate between a \$1 million position in U.S. Treasuries and a \$1 million position in a CDO-squared security. Further, it creates perverse incentives for firms to take actions that are not in their best long-term interests: for example, it disincentivizes them from setting aside pools of excess liquidity to reduce their liquidity risk, while encouraging them to make risky loans - since both of these are penalized equally in the calculation of a leverage ratio.

Furthermore, the current proposals will cause the balance sheet to be grossed up (for the purpose of this test) in an economically illogical manner. For example, netting of secured funding transactions with the same counterpart will not be permitted, even if an enforceable netting agreement is in place, causing leverage ratios to be significantly negatively impacted even though there is no actual increase in risk. A further example is the inclusion of notional amounts which

are a poor reflection of actual risk. As a result, it is likely that leverage ratios will become the binding capital limitation for most banks. This would incentivize the exit of low-risk, highly liquid businesses in favour of the higher returns that can be earned by focusing on more risky, less liquid exposures – an outcome that would neither benefit the wider economy, nor serve to strengthen the resilience of the financial sector. The proposals will cause firms to incur the operational risk and costs of maintaining two sets of records, one for accounting and another for regulatory purposes.

Further poor incentives will result from the fact that cash collateral received from counterparties to OTC derivative transactions would lead to *both* the receivable and the cash collateral being counted in the leverage exposure measure, causing a bank to be effectively penalized for pursuing risk management practices that should generally be encouraged.

We strongly urge the Committee to rethink the introduction of such a blunt, non-risk-sensitive metric as a leverage ratio. At a minimum, if there is to be a leverage metric, it should be a monitoring ratio and not a binding one.

Counterparty Risk Capital Requirements

We are extremely concerned about certain aspects of the proposals for changes to counterparty risk capital requirements, since we believe their impact would be disproportionate to any perceived weaknesses in the existing Basel II capital framework, and would lead to significant double-counting of risk. For example, the current proposals would substantially increase the capital requirements for credit risk on OTC derivatives. Although Goldman Sachs has been in the forefront of industry efforts to expand the use of central clearing houses, we strongly believe that OTC derivatives should continue to play an important role in the broader economy, since not all risks can be traded and hedged using standardized contracts. The amount of capital that is set aside today for credit risk on OTC derivatives is already many times greater than any losses that we experienced during the financial crisis; nevertheless, the proposals will increase this capital requirement yet further, thereby making it more expensive for banks to carry such exposures. This has the potential to reduce liquidity in the markets and make capital markets smaller, less efficient and more expensive for ultimate end-users.

We are particularly concerned with the proposals in the following areas:

- a) Although we support the Committee's proposal to include Credit Valuation Adjustment ('CVA') risk in capital requirements, the "bond-equivalent" methodology proposed suffers from a number of drawbacks, including:
 - it is not a good approximation to CVA and we believe will encourage significant mishedging of credit risk;
 - given the differences in Potential Exposure models used by firms, the bond 'notional' approach will not produce an equivalent capital charge for CVA risks across banks; and
 - it does nothing to address the current disincentives to hedge rates and volatility risk in the CVA.

Therefore, we do not believe that this proposal will have the intended effect of strengthening the banking system.

Instead, we believe that it is very important that CVA itself (rather than some approximation to CVA) be included in VaR. To that end, we propose a modified Effective Expected Positive Exposure ("EEPE") framework in which banks would be allowed to include CVA in VaR directly, along with all CVA hedges. Additionally, we propose an alternative, simplified methodology that will avoid some of the drawbacks of the bond-equivalent approach, and we have provided details in the attached paper titled "Comments on Bond Equivalent Counterparty Risk in VaR".

- b) We have both conceptual and practical concerns with the Committee's proposal for banks to run two sets of calculations for EEPE calculations: one using data from the most recent period and one using data from a stressed period. Conceptually we do not believe that banks that use market-implied parameters in their simulations should additionally be required to run calculations based on historical data, since the market-implied parameters typically adjust promptly to periods of higher stress.

Furthermore, from a practical perspective, certain aspects of this proposal are not clear, and it is extremely costly and computationally complex to run two sets of calculations. Instead we believe that the Committee's concerns could be appropriately addressed through a scaling approach on firms' existing calculations, or through stress testing.

- c) We support the principle that, for certain less liquid contracts, a longer risk horizon for OTC derivatives and Securities Financing Transactions ('SFTs') should be incorporated into the capital requirement calculation to ensure that Exposure at Default ('EAD') is not substantially underestimated. However, while we agree that this may be appropriate for less liquid contracts, implementation for all products would result in unnecessary and potentially material changes to existing models used for risk management purposes with minimum potential gain. Further, this would again require firms to run two different calculations - one for risk management and one for capital calculation purposes.
- d) We believe that the Committee's proposal to apply a multiplier of 1.25 to the Asset Value Correlation ("AVC") for certain types of financial institutions is conceptually flawed, since the reasoning given i.e., the need to capture deterioration in financial firms' credit quality, is a risk that is best captured through the inclusion of CVA in VaR, rather than in a credit default-risk capital calculation. Further our own internal default history would indicate that the correlation observed in the recent crisis was not especially centred on a clustering of defaults of regulated financial institutions so we do not believe this proposal is appropriately targeted.
- e) Finally, while we support the need for models to be validated, we believe that the Committee should re think its objectives with respect to backtesting. Industry practice in this area is still evolving, and therefore the Committee should be wary of being too prescriptive at this time.

Capital Base - Underwriting and Market-making exemptions for holdings in financial firms

We support the majority of the proposals on the need for quality, consistency and transparency of the capital base, and we are sympathetic to the systemic concerns that underlie the Committee's reason for requiring banks to deduct holdings in the common stock of other financial institutions that exceed 10% of the bank's Tier 1 capital. However, we believe that an unintended consequence of the proposals is that banks will be reluctant to underwrite or make markets in another financial institution's stock. In this regard, it is important to note that major banking institutions in the past two years have underwritten the issuance of many billions of dollars of stock for other financial institutions. Therefore, we strongly urge the Committee to consider granting exemptions for positions held temporarily as part of an underwriting transaction, and for market-making positions which do not represent long-term investments in another bank's capital. Without such exemptions, liquidity in banks' common stock would be significantly reduced, and it is not clear how (or at what cost) financial institutions will be able to raise capital in the capital markets.

Pro-cyclicality

We recognize that the Committee has not yet put forward specific proposals in this area. However, before making another series of specific proposals, we consider it important that an assessment be undertaken to determine the extent to which capital standards were really *pro*-cyclical during the recent financial crisis i.e. to what extent did existing Basel I and Basel II capital standards drive the cycle rather than merely reflect it. Unfortunately, there appears to be a strong consensus in many circles that the Basel standards drove the cycle, whereas a strong case can be made that in fact the cyclical characteristics of the crisis simply reflect the reality of the financial and economic facts of life regarding behavior in the circumstances of the crisis.

It is also critical that the debate in this area recognize the reality that economic cycles will occur, and that it is not feasible to remove risk such from the system entirely. Therefore the primary focus should be on the need for banks to improve their existing valuation, risk measurement and risk management processes to deal with cycles as they occur. We believe that assessments of capital adequacy through economic cycles should be informed by a series of stress scenarios, through both internal capital assessments and supplementary supervisory stress tests.

Capital Conservation

We agree with the Committee's comments that banks facing depletion in capital as a result of losses should be cautious in their distribution of earnings and capital. However, we do not support the proposed approach of establishing a "Minimum Capital Conservation Ratio", dependent on the level of excess capital over the minimum regulatory capital standard. Such an approach is unnecessarily rigid, and would ignore the particular circumstances of each bank, including the exact risks it faces relative to the stage of the economic cycle in which it is

operating. Supervisory authorities already have sufficient power to constrain the distribution of capital by banks, whether that is in relation to dividend payments, share buybacks or discretionary bonuses – and this power has been demonstrated by many supervisors in the last year. Accordingly we believe that the Committee should establish a set of broad principles in this respect for both banks and their supervisors as opposed to a rigid, “one size fits all” framework.

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In closing, we wish to repeat our support of the efforts of the Committee, and to express our desire to assist the Committee in any way that would be helpful.

Yours sincerely



David Viniar
Chief Financial Officer

cc. Norah Barger, Federal Reserve System
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A. Raising the Quality, Consistency and Transparency of the Capital Base

Summary

We are supportive of the Committee's efforts to refocus Tier 1 capital on common equity to improve quality, consistency and transparency of banks' capital bases. However, the quantitative impact on banks points to a need for a multi year implementation incorporating grandfathering provisions to minimize the market disruption from multiple firms approaching the capital markets for new capital, or to convert existing capital, at the same time in a very short timeframe.

Additionally, while we support the focus on the predominance of common equity in Tier 1, we do believe that there should still be a role for certain other forms of capital, up to a set percentage of the bank's common equity. In particular, we would like the Committee to further consider as "Tier 1 Additional Going Concern Capital" long-dated instruments and cumulative instruments that have meaningful deferral flexibility, and also to analyze further the potential benefit accorded by contingent capital and convertible capital to enable loss absorption.

We also believe that there may be unintended consequences arising from the Committee's proposed capital deductions in respect of holdings in financial institutions' common stock e.g. the impact on underwriting of financial institution stock issuance.

Definition of Capital

As noted above, we support the overall direction of the proposals on the predominance of common equity within Tier 1, but believe that certain other forms of capital should also have a role within Tier 1 capital. In particular, we request that the Committee consider the inclusion of long dated instruments and cumulative instruments that have meaningful deferral flexibility as "Tier 1 Additional Going Concern Capital". Securities with these features have generated significant loss absorption and capital preservation for US banks in the recent crisis. For example, at least 7 banking institutions in the United States have generated over \$6bn of common equity by repurchasing or exchanging their dated, cumulative trust preferred securities at discounts to their par values.

Deductions from Capital

We have some concerns on the proposed Regulatory adjustments to regulatory capital:

- 1) Deduction of certain investments in other financial institutions and for banks' own shares:
While we support the broad direction of the proposals in this area, there are a few important points we would like to raise:
 - a. We are concerned with the proposal for banks to deduct the excess of their holdings in other financial institutions which, in aggregate, exceed 10% of the bank's common equity. While in principle we understand the Committee's concerns, it is important that both the market liquidity of banks' securities and the ability of banks to raise additional

capital be taken into account. We therefore believe that some positions should be excluded from this test:

- i. Positions held temporarily as a result of one financial institution underwriting the issuance of another financial institution's capital should be excluded from this test. Without such an exemption, financial institutions will find it increasingly difficult and expensive to underwrite financial stock. Instead, a temporary exemption should be given to positions held as a result of underwriting activity.
 - ii. Recognition should be given to circumstances where banking institutions are market-makers in the stocks of other financial firms. Requiring deduction of such positions could adversely impact the liquidity of banks' capital instruments. We would encourage the Committee to analyze the potential impact of these proposals and consider an exemption for positions that result from market-making activities.
- b. We do not understand the Committee's objectives in requiring firms to look through holdings in index securities in order to identify positions in own shares and in other financial institutions:
- i. Holdings in index securities are direct holdings in a bank's own shares or in another bank's common stock, and the deduction is therefore at odds with the economic reason for the holding. Using indices is a cost effective means to gain exposure to the overall market or targeted sectors of the market. In general, the fact that a bank indirectly holds its own securities as a result of holdings in index securities is purely incidental; therefore looking through to the individual exposures in the index does not accurately reflect the business risk of these holdings or the reason for holding index securities.
 - ii. There is some ambiguity as to whether the proposed deductions here are intended to reflect legal ownership only, or economic interest. The consultative paper indicates that short positions can only be reflected if they involve no counterparty risk; this, together with the Committee's justification of the proposal (that it is to address double-counting of capital), indicates a focus on legal ownership. However, aspects of the Quantitative Impact Study ("QIS") (e.g. long positions held in other banks' common stock through TRSs) indicate more of a focus on economic interest – we believe that the latter is unnecessary as this economic risk is capitalized through the Risk Weighted Assets calculations.
- c. Requiring a bank to deduct the *full amount* of an investment in another financial institution that exceeds 10% of that institution's common stock leads to a cliff effect, where a bank may purchase a small amount of common stock in a financial institution as part of a market-making or other client-driven trading activity that is unrelated and separate from the original investment, and which may trigger a significant deduction of the full 10% holding, with a potentially significant decrease in capital and leverage ratios. While we acknowledge the need to address the systemic risk of banks' holding each others capital instruments, we believe that it would be more practical to deduct only the incremental amount over 10%, and for the 10% not deducted to be included in the test on the aggregate of holdings in other financial institutions' stock.

- d. In addition to the concerns raised above, these proposals also create practical issues, could lead to double-counting of capital requirements, and cause inconsistencies with how such positions are risk-measured and managed. We would ask the Committee to consider further how these proposals can be amended to reduce these implementation issues. The following examples illustrate our concerns:
 - i. The proposal to look through holdings in index securities would be onerous to implement and very time consuming to track and manage. For instance, if an index security has both financial and non-financial underliers, some part of the security would be deducted, potentially at 100%, but the whole position would be included in VaR.
 - ii. Similarly, the proposal to deduct excess holdings in financial firms would give rise to implementation issues. For example, it is uncertain which positions would be deducted at 100% and should therefore be excluded from VaR to avoid double-counting of capital requirements.

2) Cumulative gains and losses due to changes in own credit risk on fair valued financial liabilities

We are concerned by the proposal to extend the existing deduction - related to changes in a bank's own credit risk for liabilities that are fair valued under the Fair Value Option - to all fair valued financial liabilities. The Committee has not provided any reasoning for this proposal, but we would assume that it is being put forward due to concerns as to whether the 'liability-side' CVA can be realized at times of stress. While there may be a case for this in relation to the existing deduction (i.e. as to whether banks would in practice repurchase debt that they have issued as their credit spread widens), we do not believe that it is the case for other fair valued financial liabilities which are typically part of trading portfolios. This liability-side CVA is realized as part of daily trading activity, and is a reflection of where the market is trading. Requiring the liability-side CVA to be deducted creates a fundamental and inappropriate break from banks' mark-to-market valuation. If there is a concern as to the valuation, that should be addressed through an assessment of the overall appropriateness of the mark-to-market valuation, rather than through a capital deduction.

B. Risk Coverage – Counterparty Risk Capital Requirements

Summary

We are alarmed by the degree of the Committee's focus on counterparty risk capital requirements, since we do not believe that this area was the source of the majority of losses during the financial crisis. We are therefore concerned by the very large increase in counterparty risk capital requirements that results from the Committee's proposals, which we believe is disproportionate to any deficiencies in existing counterparty capital requirements.

Given the expansive scope of the Committee's proposals on counterparty risk, we have a number of points of concern that we would wish the Committee to consider.

1) **Stressed EEPE**

The Committee proposes that, in calculating Effective Expected Positive Exposure (“EEPE”) and Exposure At Default (“EAD”), banks should use data both from the most recent period and from a stressed period taking the largest resultant charge as the capital requirement. From a practical point of view, the proposal has a number of potential disadvantages:

- Performing the stressed calculation is not straightforward conceptually for banks that use market-implied parameters, or combinations of historical data and market-implied parameters. There is no single method for choosing the market-implied parameters from the stressed period, combining them with historical market data, and using them to run a simulation that starts from current market levels.
- It is not clear that the output of these “stressed” computations will serve a useful risk management purpose, and the parameters would not therefore be incorporated into firm’s regular potential exposure calculations; consequently firms incur the operational risk and cost of running two sets of calculations, one for risk and the other for capital purposes.

We also note that, for banks that use market-implied parameters in their simulations, there may be less of a need for the stressed calculation than for banks that use exclusively historical data, because the market-implied parameters will adjust quickly and result in a higher capital requirement.

If the Committee’s objective is to achieve a higher level of required capital, this could be achieved more simply either by applying a multiplicative factor greater than one to the EEPE numbers, or by using a confidence level more extreme than the current 99.9%. This would be preferable to an approach that imposes a significant cost and resource burden for little, if any, incremental risk management benefit.

2) **Unexpected CVA Losses – CVA VaR**

While we broadly support the need for banks to value and manage their CVA risk, we question whether the Committee intended the proposals to have such a disproportionate outcome. We believe that this is partly driven by conceptual weaknesses in the proposed approach. We have expanded on these concerns, and proposed an alternative approach, in the attached document “Comments on Bond-Equivalent Counterparty Risk in VaR”.

3) **Wrong Way Risk**

We agree with the overall approach to addressing specific wrong-way risks. However, the proposed language on general wrong-way risks does not sufficiently recognize the inherent challenges in defining, identifying, and quantifying the many types of general wrong-way risk which might show quite imperfect correlations and unpredictabilities. It will typically require expert judgment on the part of risk managers to identify and quantify material wrong-way risks and to select those that, in their view, need to be monitored carefully and potentially require reporting “to senior management and the appropriate committee of the Board on a regular basis”.

4) **Increased Correlations for Financial Institutions**

The Committee proposes to apply a multiplier of 1.25 to the “asset value correlation” (AVC) for counterparties that belong to certain classes of financial intermediaries. We believe that this is a blunt tool to address inter-connectedness, and would distort the calibrations within the existing capital framework.

We believe that equating correlation in credit deteriorations with default correlations is flawed, both conceptually and empirically. The paper states that “during the crisis, financial institutions’ credit quality deteriorated in a highly correlated manner and they proved to be relatively more sensitive to systemic risk than nonfinancial firms”. However, the correlation parameter is an input to a part of the capital calculation that reflects the risk of actual defaults, not the risk of credit deterioration. It is not the function of the correlation parameter to capture the latter risk; instead, the existing framework seeks to reflect this in the maturity adjustment.

As discussed elsewhere, changes in credit quality are reflected in CVA, and the Committee has separately recognized that capitalizing the CVA risk might alternatively be achieved by including CVA in VaR (see comments above). To include an additional requirement here would be to double count.

We believe therefore that:

- a) any observed correlations in credit deterioration are best captured within CVA and capitalized within a CVA VaR-based approach; and
- b) that it may be appropriate to recalibrate the default correlations within the existing credit capital framework, using data that include the most recent period; however, we do not believe that there is a need to change the calibration methodology which is the effect of the Committee’s approach.

Our internal counterparty default data indicate that:

- over a longer time window, clustering of default tends to happen in various industries, but not necessarily in the financial industry; and
- in terms of the fraction of counterparties that defaulted, financial entities did not seem to distinguish themselves from firms in other industries.

Based on this, we see no strong evidence that financial intermediaries should be assigned higher correlation parameters than other firms. We would be happy to share with the Committee further details on our internal analysis.

5) **Increased Margin Period of Risk**

We support the principle that, where appropriate (e.g. for less liquid contracts), a longer risk horizon for certain OTC derivatives and Securities Financing Transactions (“SFTs”) should be incorporated into the capital requirement to ensure that the EAD is not substantially underestimated.

However, the Committee's desire to apply this more broadly (e.g. to large netting sets of liquid contracts), would result in firms having to choose between bearing the increased risk and overhead of running two models (i.e. for capital and for risk management), or being forced into amending their internal risk models to fall into line with parameters that they do not believe are appropriate for risk management. As with Stressed EPE, if the Committee's primary aim is to ensure that EAD is conservatively estimated, we believe that this could simply be achieved through the use of a multiplier or higher confidence level.

We believe that setting exact parameters would be unnecessarily prescriptive and we recommend that the criteria and thresholds set by the Committee be used as a starting point for banks to have discussions with their supervisor. For example, banks should be allowed to set materiality thresholds for margin call disputes, or a more appropriate threshold for netting set size, where they can demonstrate to their supervisor that there is no material increase in risk. We believe that the criteria applied should be representative of the increase in risk and that this requires qualitative judgments rather than arbitrary limits. This is more likely to achieve the Committee's stated aim and result in a more accurate estimate of EAD.

Comments on the specific cases where a higher supervisory floor is proposed:

- (i) Netting sets with more than 5,000 trades
 - Portfolios of such size can sometimes be hedged/replaced via the net risk sensitivity, which may make the replacement costs lower than smaller portfolios of less liquid and less vanilla trades. A netting set can therefore be reduced to a small number of trades to close out or hedge the exposure to a counterparty.
 - Our experience from the financial crisis is that we were able to do just that (i.e. quickly close out positions with certain counterparties that had very large netting sets); therefore in practice netting set size is often not a material determinant of increased close-out risk, and the setting of a threshold based on the number of trades is entirely arbitrary.

- (ii) Netting sets with illiquid collateral:
 - The Committee's proposal is likely to cause firms to reduce the eligible collateral that they will allow, and we believe that this will have an adverse impact on the liquidity of financial instruments in the market.
 - We suggest that banks are required to improve their reporting of collateral breakdown by asset type, then monitor and proactively risk manage counterparties and transactions where illiquid collateral is posted.

- (iii) Netting sets with OTC derivatives that cannot be easily replaced:
 - We support the identification of illiquid OTC derivative transactions in principle, however, to ensure consistent application, the Committee should consider setting benchmark assumptions on OTC derivative transaction liquidity. These benchmarks can act as a starting point for banks' discussions with their supervisors. Where banks can demonstrate that OTC derivative transactions can be easily replaced the lower supervisory floor for the margin period of risk should be applied.

(iv) Netting sets that have experienced more than two margin call disputes over the previous two quarters:

- While margin disputes should be taken into account in the capital calculation, the particular proposal suffers from an unrealistically simple assumption that the mere existence of two disputes in the past quarter means the entire portfolio will experience a higher margin period of risk in the future.
- The trigger for doubling the margin period of risk due to historical disputes is applied without any regard to whether or not the current portfolio is likely to see recurrence of disputes whose root cause may have been resolved. This is a particularly unreasonable assumption when disputes are taken out of context.
- Most disputes relate to specific trade queries that are solely relevant for that trade (e.g. a more structured trade) and would not impact the other (vanilla) positions in that portfolio.
- Disputes with other banks and broker-dealers are typically driven by the fact that they each use their own internal valuation methodologies. Provided that the size of any such dispute remains with reasonable levels of materiality, these should not be regarded as triggers for terminations or increased margin periods of risk.

6) Preclude Downgrade Triggers

We support the recommendation to disallow downgrade triggers in EAD calculations. While we view downgrade triggers as a valuable risk mitigant, we recognize that there is wrong way risk in the assumption that we would be able to collect additional collateral while the counterparty's credit is deteriorating. Therefore, in the spirit of conservatism, we support disallowing benefit beyond the current threshold for collateral arrangements with downgrade triggers.

7) Operational Performance of Collateral Department

We generally support the expectation that banks applying the Internal Models Method (“IMM”) should have adequate resources and controls over the collection and tracking of collateral. However, we feel that the proposed paragraph 51(i) is too specific in requiring that a “single collateral management unit” be responsible for making calls, controlling data integrity, tracking rehypothecation, and monitoring collateral concentration. While we agree that banks should have adequately staffed units performing these functions, we believe that this proposal is unnecessarily prescriptive in determining every bank’s operational structure. The rule should afford banks the flexibility to perform these critical functions wherever in their organization is best suited to handle them. For example, a Treasury unit may be best placed to monitor rehypothecation and a Controllers department may be best placed to ensure the integrity of data required for margin calls. Likewise, while we support the reporting requirements set out in 51(ii), but believe that the rule should afford banks the flexibility to produce the required reports outside of the collateral management unit if doing so would be more suitable given the organizational structure of the bank.

8) Controls Around the re-use of Collateral

We support the Committee's proposals to amend paragraph 51 of the Revised Basel Accord regarding improvements in liquidity risk management practices, but we believe that these

proposals should apply to all firms (and not just IMM banks) where warranted by the nature, scale and complexity of its activities.

9) Model non-cash jointly with underlying securities for SFTs

We agree that, if material, non-cash collateral should be modeled jointly with the underlying SFT securities. However, such modeling should not be required if the bank can show that its haircuts on collateral are sufficiently conservative.

10) Qualitative Collateral Management Requirement

We generally support the expectations set out in the proposed paragraph 115(i) to ensure the orderly operation of margin agreements and existence of sound collateral management policies. While collateral concentration should be monitored, specific reporting on volatility and liquidity should only be required for non-liquid or higher risk collateral. There is little benefit to requiring reporting on liquidity and volatility for highly-rated, liquid government and corporate securities commonly used as collateral.

11) Stressed Probabilities of Default (“PDs”) for Highly Levered Counterparties

We do not agree with the proposal that exposures to “highly leveraged counterparties” should be subject to a higher test than other counterparties, through a PD estimate that is based on periods of stressed volatilities. We do not believe that it is appropriate to propose such a test based purely on assessments of leverage (which is not necessarily an accurate reflection of risk). All banks in setting their internal ratings, and associated PDs, as well as in estimating their Loss Given Default measures, should consider all aspects that might impact on a counterparty's performance, including the extent to which they are leveraged. Similarly, requirements to rate counterparties through the cycle should facilitate consideration of stressed periods in determining PD for all counterparties, not just one subset. We believe that the concerns addressed in this issue are already covered in the final rule's requirement to use appropriate conservatism.

12) Central Counterparties (‘CCPs’)

Provided that the enhanced standards for CCPs which are to be issued by the Committee on Payment and Settlement Systems (CPSS) and the International Organization of Securities Commissions (IOSCO) are rigorous and comprehensive, the application of a zero exposure value for trades cleared through CCPs is appropriate. We support the shift to a consistent treatment for CCPs compared to the existing rules which require each bank to independently seek supervisory approval before applying a zero exposure value to cleared trades. We note that given their systemic importance, even with adherence to robust standards established by CPSS and IOSCO, CCPs present a unique, concentrated risk¹ and are worthy of globally consistent, formal supervision.

¹ While we support the increased use of CCPs, it is critical that it is recognized that CCPs are not a panacea for all ills, and that the concentration of risk could have certain unintended consequences and increase systemic risks; we would recommend further assessment of this potential impact.

13) Alpha Factor

We support the proposed amended language to paragraph 36, however we would note the following:

- The main purpose of alpha is to account for wrong-way risk. We propose that, if the bank has adequately adjusted for wrong way risk in its CDS model and in its counterparty credit risk capital model, then it should be possible to apply its own estimate of alpha below 1.2.
- Some banks calculate counterparty credit risk capital for separate product classes and then add them up. In such cases, they should be allowed to estimate a different alpha for each product class. Some of those might be less than 1.2 and some higher than 1.4.

14) Stress Testing

We agree with the Committee that stress testing should be engrained into the risk management framework and the risk culture at IMM firms, and that the results of stress tests should be integrated into regular senior management reporting. We view stress testing as an integral component of a comprehensive framework of Counterparty Credit Risk Management. As such, we broadly agree with the stress testing proposals set out in the paper.

We do, however, believe that IMM firms should maintain some discretion as to the frequency, composition and magnitude of the stress testing regime, and subject to discussion with their regulators. That regime should encompass single and multifactor stress testing and require scenarios to be designed and run on a periodic basis to capture material risks and vulnerabilities particular to firms. It is critical that firms maintain the ability to appropriately tailor the stress testing regime such that it focuses on the risks that are most material to that firm, i.e. firms should have discretion to exclude immaterial exposures from stress testing regimes as the costs could potentially outweigh the benefit.

We are also supportive of reverse stress tests as a compliment to traditional stress testing techniques. However, due to the intensive resources required to conduct firmwide reverse stress tests, we believe that the frequency of such reverse stress tests should be established by individual IMM firms and conducted more or less frequently depending on underlying market conditions.

15) Backtesting and Model Validation

In general, we agree with the validation, documentation, and backtesting requirements that must be satisfied for EPE model approval. However, in some places, we feel that the proposed requirements are too prescriptive. Backtesting best practice is still evolving and it is important for banks to have the ability to design tests that they find useful for uncovering model inadequacies.

One example where we believe the proposed requirements would be too prescriptive is the proposal that backtesting be done on the whole forecast distribution. That test is too broad to be useful, and will not help the firm to uncover EPE model weaknesses. All models are approximations to reality. Models are designed for a specific purpose and are adequate models if

they do indeed achieve that purpose. But a model that is adequate for one purpose may be a poor approximation for other purposes.

Good validation tests of models should help decide whether the model is adequate for its purpose. Tests that are overly broad and that test irrelevant behaviour will not help to validate a model for its intended purpose. We have provided below examples that illustrate this point:

- The Black-Scholes model is designed to price options. The pricing formula is derived under the assumption that asset prices follow geometric Brownian motion, implying that volatility is constant. We believe that a test that requires that the underlying dynamics really be geometric Brownian motion is overly broad. That test will certainly 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 potentially better test would examine whether implied volatility is a biased predictor of realized volatility, and would be able to discriminate between the case where a bias is hard to exploit and one where it is easy. Failure of such a test would imply that the model is inadequate for its intended purpose.
- The point is also true for models that are designed to predict extreme outcomes. Asymptotic distribution theory would suggest that under certain circumstances the tail of the distribution could be well-described by a Generalized Pareto Distribution (GPD). However, a test that required that the entire distribution be consistent with GPD would not be useful. The test would almost certainly fail, but the test's failure would not indicate whether the model is accurate for the purpose for which it has been constructed.

An EPE model is designed to predict some percentile of the loss distribution, in order to compare to a limit. It is also designed to predict expected exposure for capital purposes; however, it is not necessarily designed to predict every percentile well. A model might be constructed to be more conservative along certain dimensions, but, in doing so, may fail a forecast distribution test.

The stressed EEPE model proposed by the Committee is designed to ensure that capital is adequate even under very stressed economic conditions. The model achieves that purpose by using a calibration more appropriate for a financial crisis. However in doing so, the model would be likely to fail a 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.

We believe that good tests of models should clearly and specifically assess whether the model is achieving the purpose for which it is constructed. If a test is well-designed, then its failure should make it clear how the model should be adjusted. A good test will lead to actionable results.

In our own backtesting methodology, we have designed focused tests that assess whether our models perform adequately along the dimensions the models are designed for: 95% potential exposure, regulatory and economic capital, and adequacy over the near term. When these tests have failed, we have been able to change the models appropriately.

We also believe that the proposed backtesting requirements may be too prescriptive in other areas. The proposed language would require that risk factors be tested separately. However, the backtest is a test of a joint hypothesis that the risk factor simulation is suitable and that the pricing models are accurate. The failure of a piece of the joint hypothesis does not imply a failure of the joint hypothesis. As an example, the failure of a test for an implied volatility simulation may not matter for a backtest of the potential exposure of an option, since at the potential exposure the option tends to be in the money and volatility may not be significant risk factor.

We would recommend that the proposed language require that the purposes that the EPE model is designed for be clearly documented. The backtesting methodology should be required to include clear and unambiguous tests that will assess whether the model does achieve that intended purpose. However, rather than imposing tests that are too prescriptive, individual firms should be allowed to specify the details of those tests.

C. Leverage Ratio

As we have already noted, we do not consider a leverage ratio to be a meaningful measure of risk or of capital adequacy, and we believe that a return to this metric would create numerous perverse incentives for firms to take actions that would neither benefit the wider economy, nor increase the resilience of the banking sector.

However, notwithstanding our overall concerns on the validity of the metric, we offer the following comments:

1. **Calibration:** since the ratio has not yet been calibrated, it is impossible to comment with any certainty on the impact of the proposals. However, the Committee will need to balance carefully the potential for a grossed-up and notional-driven ratio to lead to a very severe contraction of credit and loss of market liquidity, given that it penalizes the intermediation function of market-makers. Specifically, market-makers' role of risk intermediation (whereby they take on risk via client servicing transactions and hedge the risk with other counterparties) is very severely penalized under the current proposals, which ignore the fundamental technique of hedging.
2. **Credibility:** given the limited information that can be accurately gleaned from a leverage ratio, it is critical that any proposed metric have general acceptance and market credibility. In those countries that already have a leverage ratio test (for example, the United States, Canada), the leverage ratio has at least the virtue of simplicity and has therefore gained some degree of market acceptance. However, we believe that a grossed-up ratio that is contemplated would cause significant market confusion.
3. **Netting and credit risk mitigation:** for the purpose of the proposed leverage ratio, netting of OTC derivatives or secured funding transactions would not be permitted (even if an enforceable netting agreement is in place), and no benefit would be given for collateral received. Such a proposal disincentivizes good credit, market and legal risk management.

For example, a decision to hedge a position will likely improve a bank's risk profile and risk-based capital ratios, but at best it will leave the leverage ratio unchanged and at worst will impair it.

We consider that supervisors already have sufficient power to ensure that banks recognize the fact that "zero gross exposure is different to zero net exposure". In fact, under existing regulatory capital requirements, credit risk mitigation should only be taken into account if based on a strong legal foundation and good risk management disciplines.

4. **Comparability:** we do not believe that a grossed-up, notional-driven leverage ratio would actually be comparable across institutions or jurisdictions. For example, differences in the scope of consolidation leave significant room for inconsistency from country to country.
5. **Harmonization of accounting standards:** we believe that the proposals simply fail this test, both with respect to having a meaningful approach to netting and credit risk mitigation (see above), but also because one of the most fundamental differences in accounting treatments (namely, banks' differing use of mark-to-market vs cost accounting) is completely ignored in the proposals. However, the extent to which banks use fair value will be different, and this means that the measure of both capital and leverage will be inconsistent and not directly comparable across institutions and jurisdictions. Ignoring this fundamental difference in accounting realities is inconsistent with the Committee's stated objective to have a measure "fully adjusting for material differences in accounting".
6. **Off-Balance Sheet items:** to the extent that any leverage ratio is required, we support the need to address the question of off-balance sheet items. However we believe that the inclusion of commitments and written credit derivatives at 100% of notional (and possibly also other derivatives at some percentage of notional) could be very damaging to the availability of credit. Further, if a bank has written down a credit derivative on which it has sold protection, it should not be required to put 100% of the notional on the leverage measure, as that would overstate the actual loss that the bank would suffer on a credit event.

D. Pro-cyclicality

As we have already noted, before making another series of specific proposals, we consider it important that the Committee undertake an assessment to determine the extent to which capital standards were really *pro-cyclical* during the recent financial crisis (i.e. to what extent did existing Basel I and Basel II capital standards drive the cycle, rather than merely reflect it).

In this debate, it is also important to recognize the reality that economic cycles will occur; therefore, the primary focus should be on the need for banks to improve their valuation, and risk measurement and management processes to deal with such cycles. We believe that assessments of capital adequacy through the cycle should be informed by severe stress scenarios (through both internal capital assessments and supervisory stress tests).

In principle we agree that regulatory capital measures should not be pro-cyclical (i.e. that they should not exacerbate the economic cycle). However, we also strongly believe that it is important for banks to face up to the realities of the economic cycle, both in their accounting practices and in the recognition of losses through the mark-to-market process; in fact, care should be taken to ensure that measures are not *counter*-cyclical, or that banks can return to the days of hidden reserves and profit-smoothing.

At this stage, we do not believe it has been clearly established that the reduction in the availability of credit during the financial crisis was driven by regulatory capital considerations, as opposed to risk management concerns (it should be remembered that, during the crisis, capital requirements were based on Basel 1 in some jurisdictions and Basel 2 in others). The Committee has not publicly shared data on its own assessment of the issue. However, until the magnitude of the pro-cyclicality issue has been made known, it is almost impossible to assess and achieve an appropriate calibration of the proposals.

We also note that, rather than a further series of measures (which could have unintended consequences at this time), tools that already exist in the Basel framework could be given more weight and attention by supervisors in order to address the question of pro-cyclicality.

For example:

- The inputs to the existing capital calculation for counterparty credit risk are already designed to reduce pro-cyclicality, through the use of inherent parameter conservatism (e.g. “through-the-cycle” credit ratings and “downturn loss given default” factors).
- While the VaR-based component of the market risk regulatory capital requirement varies with changes in market volatilities and other parameters, it is only one, relatively small component of the total market risk capital requirement. Further pro-cyclicality is reduced by the fact that a 60-day rolling average VaR result is used. Other components of the capital requirement (such as those based on stress tests and other add-ons) are inherently much less cyclical than VaR.
- We believe that fair value accounting is less pro-cyclical than historical cost less impairment. In fact, the binary decision that an asset is impaired (and the knock-on effects of such a decision on similar asset classes) will almost certainly subject an institution to greater shocks than if it had adopted the discipline of a rigorous mark-to-market regime and responded to changing market conditions in a timely manner.

Capital Conservation

We agree with the Committee's comments that banks facing a depletion of capital as a result of losses should be cautious in their distribution of earnings and capital. However, we do not support the proposal to establish a “Minimum Capital Conservation Ratio”, dependent on the level of excess capital over the minimum regulatory capital standard. Over the past year, supervisors have demonstrated on many occasions that they already have sufficient authority to constrain the distribution of capital by banks, whether that is in relation to dividend payments, share buybacks

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or discretionary bonuses. We therefore believe that the imposition of a 'one-size-fits-all' constraint is superfluous, and would create too rigid a framework that may not be suitable in all circumstances and across all jurisdictions.

Comments on Bond Equivalent Counterparty Risk in VaR

Introduction

In the recent consultative document “*Strengthening the Resilience of the Banking Sector*”, the Basel Committee (“the Committee”) has proposed that a simplified version of the credit valuation adjustment (“CVA”) be included in VaR. This proposal represents important progress in recognizing the importance of CVA, since the CVA calculation makes possible both marking-to-market and hedging of counterparty credit risk. Because CVA methodologies differ across financial institutions, and in fact some banks do not calculate CVA at all, the Committee has proposed a bond-equivalent approach for incorporating CVA in VaR based on the Basel II calculation. This methodology is designed to create a common yardstick for banks’ CVA calculation and to encourage CVA hedging. We strongly agree with these regulatory goals, since both marking-to-market as well as hedging of counterparty risks are essential risk mitigation techniques that will reduce counterparty risk among banks and thus also reduce systemic risk. However, the simplified bond-equivalent approach will in fact discourage proper marking-to-market and hedging of counterparty risk. Because a financial institution’s Basel II calculation will generally make assumptions that are incorrect for pricing of credit risk, the bond-equivalent will not typically lead to a measure that can approximate in a satisfactory way the economic risk to the firm. As a consequence, the regulatory incentive to hedge the bond-equivalent CVA will encourage mishedging of credit risk and do nothing to encourage credit exposure hedging. Unfortunately, the CVA cannot be well captured by a simplified bond-equivalent.

Although the CVA calculation is quite complicated in general, it is possible to illustrate these points using examples in which the CVA can be calculated relatively easily. For simplicity and transparency, we will consider counterparty portfolios consisting of plain vanilla interest rate swaps. We first describe the bond-equivalent methodology, noting its potential advantages. We then argue that on closer inspection these advantages conceal significant disadvantages. In discussing these disadvantages, we provide a number of illustrative numerical examples.

In our view, for firms with robust CVA calculations, the correct way to calculate capital of counterparty risk is to use the market risk capital framework--the Effective Expected Positive Exposures (“EEPE”) framework is unnecessary. But we recognize that for various reasons the regulatory community may be reluctant to fundamentally alter the EEPE framework. We therefore propose an alternative modified EEPE methodology in which a firm, using a regulatory-approved CVA model, would be permitted to include CVA in VaR directly along with all CVA hedges. For firms that do not have a regulatory-approved CVA process, we propose an alternative simplified methodology that would mimic the CVA in important respects.

The Bond-Equivalent Proposal

Noting that “the spread risk of CVA ... has been the major source of CVA-related losses over the recent market turbulence,” the Committee has proposed that a bond-equivalent CVA be incorporated into a firm’s VaR process. Given the inconsistency of current CVA methodologies and the regulatory community’s goal of having consistent capital

treatment across banks, the Committee has proposed a common methodology based on the Basel II calculation. This methodology is designed to capture importance characteristics of a CVA calculation. For example, the notional exposures in a CVA calculation are based on expected exposures.¹ Accordingly, the Committee has proposed that the notional of the bond-equivalent be equal to the EEPE underlying the Basel II calculation, since EEPE is essentially an average of expected exposures over the first year. The CVA calculation, of course, includes expected exposures over the life of the portfolio rather than over the first year. The bond-equivalent proposal adjusts for this characteristic by setting the maturity of the bond equal to the Basel II calculation of M, which is essentially the ratio of the sum of all expected exposures over the life of the trades divided by the sum of expected exposures over the first year. The bond-equivalent then is essentially a simple portfolio consisting of a long credit-risky zero coupon bond and a short credit-riskless zero coupon bond each of which has a notional equal to EEPE and a maturity of M. To make bond-equivalents closer to CVA, the proposal requires that the cap of 5 years be removed from the calculation of M. Since Basel II compliant banks will already be calculating these quantities, the creation of these bonds will not generate significant new computational burdens on banks.

These bond-equivalents would be put into a firm's VaR model in order to calculate a market-risk based supplemental capital charge. Importantly, the Committee is proposing that the horizon used for VaR calculations be set equal to one year rather than 10 days, in order to be consistent with the 1-year credit capital charge. By their very nature, these bonds' most important risk factor will be counterparty credit spreads. The proposal would permit inclusion of counterparty-specific hedges such as plain vanilla default swaps in the VaR calculation in order to encourage hedging of the CVA. However, the CVA and hedges would be run in a standalone-VaR and would thus not be allowed to add to or offset other market risks. The proposed capital charge would be 3 times regular 99% 1-year VaR plus 3 times 1-year 99% stressed VaR.

The bond equivalent methodology would seem then to have a number of important advantages: 1) capital treatment of the CVA risk would be relatively consistent across banks; 2) the bond-equivalent calculation is similar to the CVA in terms of exposure and inclusion of counterparty spreads; 3) the bond-equivalent methodology encourages banks to hedge what is thought to be the most important risk factor, i.e., counterparty spreads; and 4) the calculations do not represent a significant new burden on banks. However, it is important to consider the potential drawbacks of the bond-equivalent methodology. Upon close examination, each of these advantages conceals significant disadvantages as well.

Consistency of Treatment of CVA Risk Across Banks

By imposing a common methodology, the bond-equivalent CVA methodology would create a consistently applied capital charge across banks. The Committee has noted that accounting standards as well as CVA methodologies differ across financial institutions. For example, some institutions may calculate CVA using the same assumptions made in credit potential exposure models, i.e., by using models that are not fully risk neutral and by assuming legal rather than expected netting. Some firms may calculate CVA unilaterally whereas other firms calculate CVA bilaterally. If firms were permitted to put their own calculations of CVA in VaR, then capital treatment of this risk is likely to be inconsistent across firms.

¹ We use the term expected exposure to mean expected positive exposure

This inconsistency cannot be avoided, however, by basing CVA on regulatory capital calculations. Since firms use different exposure models, regulatory capital calculations are also inconsistent across firms. Just as firms might use historically-based or risk-neutral models for CVA calculations, they also use different exposure models for regulatory capital. During a stressed environment, for example, firms using market-implied exposure models may have substantially higher EEPE and therefore substantially higher bond-equivalent CVA than firms that use historical models. Conversely, during periods of low volatility, firms using historically-calibrated models might compute larger bond-equivalent exposures. Thus, there is no reason that the bond-equivalent CVA will lead to consistent capital treatment.

For example, consider a firm that has a single trade in a counterparty's portfolio: a 10-year USD 100 million receive-fixed plain vanilla swap. Suppose we use a simple log-normal model to generate interest rate dynamics and that we calculate the bond-equivalent on Dec 31, 2008. A firm using historical data starting in early 2000 would have calculated an interest rate volatility of 22.2%. In that case, the bond equivalent notional would have been calculated to be 2.8 million dollars. On the other hand, a firm using a market-implied model would have used a 50% volatility, implying a bond equivalent notional of \$6.7 million, more than double.

Although firms might compute substantially different bond-equivalent CVA risks, the true CVA risk for this trade should be relatively equivalent across firms. CVA practices do vary substantially across banks, but these differences in practices do not imply that the proper methodology for CVA calculations is an unsettled question in financial economics. In fact, the basic methodology for calculating CVA is well understood and covered in two prominent textbooks: *Options, Futures, and Other Derivatives* by John Hull and *Credit Risk: Pricing, Measurement, and Management* by Darrell Duffie and Kenneth Singleton.² Although the details may differ a bit across firms, broadly speaking, CVA calculations should be based on risk-neutral simulations, exposures should be based on expectations under the risk-neutral measure, and netting assumptions should be based on expectations rather than conservative legal netting. If firms calculated CVA according to broadly agreed financial theory, capital treatment of CVA risks would be automatically consistent.

Rather than achieve consistency by encouraging the proper CVA calculation and hedging by banks, the bond-equivalent proposal attempts to achieve consistency by translating the CVA calculation into the regulatory capital calculation, which, as noted, may be inconsistent across firms. In so doing, the proposal is imposing potentially large capital incentives to compute and hedge an incorrect CVA calculation, creating the potential to damage firms' risk management practices. Proper marking-to-market of risk is an essential risk management tool because it creates strong incentives to recognize and hedge risk. The encouragement of an incorrect mark-to-market regime may obscure the risk both to the firms' management as well as to the regulatory authorities and may also promote inadequate hedging.

Similarity of Bond-Equivalent Approach To CVA

The preceding example illustrates how bond-equivalents might be inconsistent across firms. In that example, a firm using an historically-calibrated exposure model might derive a bond-equivalent that is substantially different from that of a firm using a market-implied model. But that example shows how the bond-equivalent measure can be inconsistent with the CVA

² Duffie and Singleton present a bi-lateral CVA calculation. We believe that a bi-lateral CVA calculation is correct as well. However, for simplicity we work with a unilateral CVA.

as well. As noted, a proper CVA calculation, since it is a pricing calculation, requires the use of a risk-neutral simulation model. On Dec 31, 2008, all firms should have been using approximately 50% for their volatility assumption, regardless of what assumptions they make for credit exposure calculations. To the extent that a firm's regulatory capital calculations depart from risk-neutral assumptions, their bond-equivalent calculation will differ from the true CVA.

Other features of the regulatory capital calculation will also cause the bond-equivalent to differ from the CVA calculation. For example, the Basel maturity M is only weakly connected to the duration of the CVA. If a portfolio profile has small exposures in the first year, for example, but much larger exposures after, then the maturity adjustment M could turn out to be much longer than the longest trade in the portfolio. A more realistic CVA calculation should use all expected exposures over the life of the trades, with expected exposures weighted according to survival curves implicit in the term structure of credit spreads. Moreover, CVA should use expected netting whereas potential exposure calculations typically use legal netting that is designed to capture tail rather than expected netting. Bond-equivalents, then, can be substantially different from CVA calculations. Hedges based on bond-equivalents are likely to be substantially different from hedges based on the CVA.

Is Hedging Spread Risk Enough?

To understand whether hedging the credit spread captures the risk sufficiently, a key assumption in the bond-equivalent approach, we consider a simple example: a BBB-rated counterparty with a portfolio consisting of single USD interest rate swap. We assume the term structure of interest rates is flat, the dynamics of swap rates are described by a simple log-normal model with constant volatility across time, and default swap spread term structures are flat. We make these assumptions in order to keep the analysis simple and transparent. The interest rate dynamics we assume are consistent with Black's model for swaption pricing. Under this assumption, we can obtain the CVA calculation relatively easily. The results we will obtain would be valid under more complicated and realistic assumptions for counterparties and interest rate dynamics.

Given the importance of proper risk calculations and hedging during a stressed environment, we examine at a hypothetical 2-year period in which a downturn is coupled with high volatility, similar to the events of the recent financial crisis. We specify the risk factor paths during this 2-year by modelling them after the realized history of USD interest rates, USD swaption volatilities, and BBB spreads over the recent financial crisis. Chart 1 shows the path of USD interest rates over the past 5 years. Although business cycle dates have not yet been determined by the NBER, it is likely that the recession started in December 2007 and ended in early 2010. We therefore focus on the years 2008 and 2009. Over 2008, 10-year swap rates fell approximately 200 basis points from 4.6% to 2.6% and then rose about 100 basis points over 2009 to 3.6%.

Chart 1

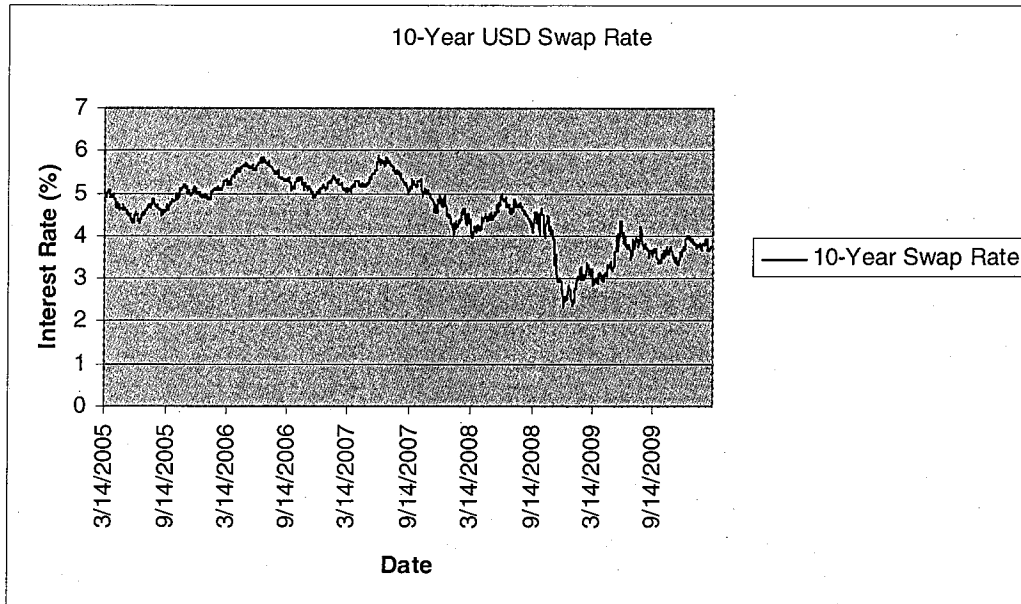


Chart 2 depicts the path of swaption volatility over the last 5 years. Over 2008, 1-into-10 year swaption volatility rose almost 30 points, from 25% to 55%. Swaption volatility over 2009 fell back about 30 points, back to 20%.

Chart 2

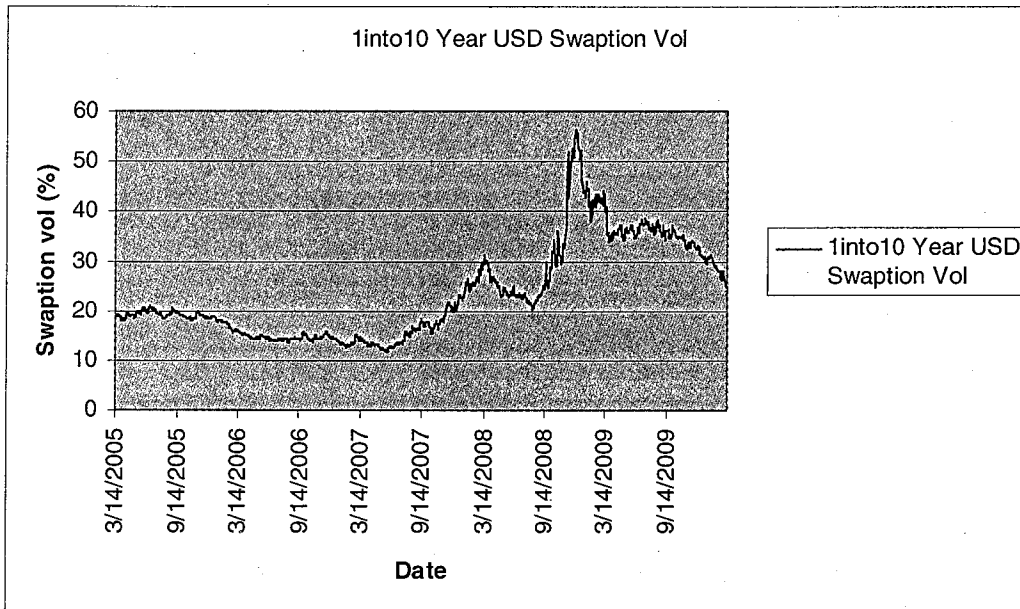
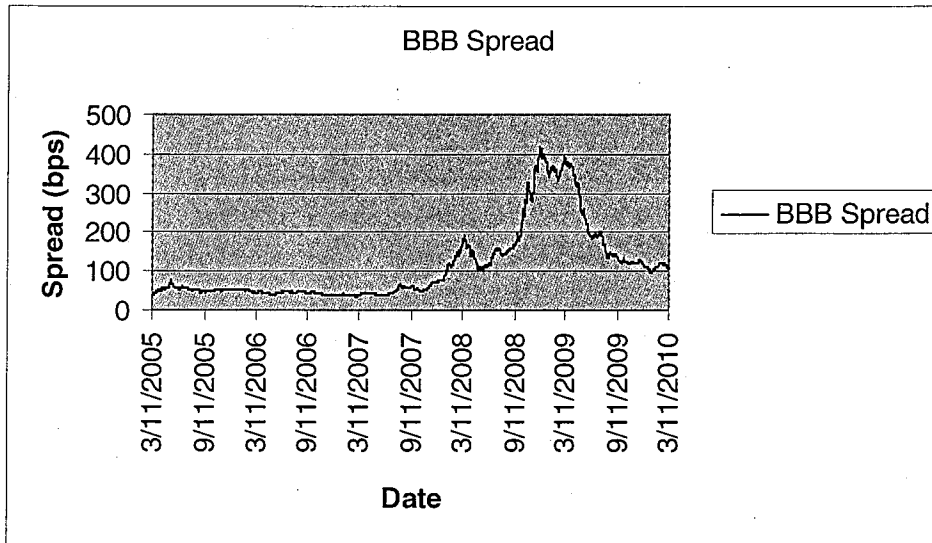


Chart 3 shows the path of the BBB spread over the last 5 years. Over 2008, the BBB spread rose approximately 300 basis points, from 100 to 400 basis points, before falling back to about 100 basis points over 2009.

Chart 3



In this example, we assume that the bank is receiving fixed in a plain vanilla USD interest rate swap. We choose a trade in which the bank is receiving fixed since exposure to the counterparty will rise at the same time the counterparty's credit quality is worsening. We assume paths of interest rates, volatility, and spreads over a hypothetical 2 year period consistent with the recent financial crisis. We assume that the 10-year swap rate is 4.6% at the inception of the trade and that implied volatility is 20%. The counterparty's initial credit spread is 100 basis points. Although CVA is in reality hedged very frequently, such as daily, we calculate the CVA and the sensitivities to the risk factors, i.e., interest rates, volatility, and credit spreads on a monthly basis for simplicity. We then calculate hedges to those risk factors and compare to mark-to-market changes in the CVA. Table 1 reports the results.

Notional of Swap (\$)	100,000,000
Tenor of swap (years)	10
Forward swap rate	4.60%
Fixed swap rate	4.60%
Current swap rate	4.60%
Swap rate volatility	20%
spread (bps)	100

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Table 1: CVA Hedges on 10-Year Receive Fixed USD Swap												
Year	Swap Rate	swap rate vol	Spread	Rates dv01	Spread sv01	Vol dv01	CVA	Rates Hedge	Spread Hedge	Vol Hedge	Total Hedge	CVA Change
0.00	4.60%	20%	100	-1,608	1,917	101	205,279	-	-	-	-	-
0.08	4.43%	23%	125	-2,184	2,343	120	318,157	26,808	47,913	29,533	104,254	112,878
0.17	4.27%	26%	150	-2,776	2,748	135	454,055	36,392	58,566	35,025	129,983	135,898
0.25	4.10%	29%	175	-3,375	3,129	148	611,236	46,259	68,701	39,511	154,471	157,181
0.33	3.93%	32%	200	-3,976	3,486	157	788,296	56,244	78,227	43,096	177,567	177,059
0.42	3.77%	35%	225	-4,577	3,816	165	983,202	66,274	87,139	45,903	199,316	194,906
0.50	3.60%	38%	250	-5,173	4,121	169	1,194,222	76,277	95,402	47,987	219,667	211,020
0.58	3.43%	40%	275	-5,767	4,403	172	1,420,363	86,222	103,030	49,412	238,664	226,140
0.67	3.27%	43%	300	-6,355	4,662	173	1,659,560	96,114	110,081	50,266	256,460	239,198
0.75	3.10%	46%	325	-6,938	4,899	173	1,910,327	105,920	116,551	50,568	273,039	250,766
0.83	2.93%	49%	350	-7,518	5,117	170	2,172,223	115,635	122,475	50,363	288,473	261,896
0.92	2.77%	52%	375	-8,092	5,315	167	2,443,174	125,293	127,919	49,722	302,934	270,951
1.00	2.60%	55%	400	-8,662	5,496	162	2,721,962	134,868	132,885	48,652	316,406	278,789
1.08	2.68%	52%	375	-8,050	5,307	155	2,427,120	-72,184	-137,409	-47,189	-256,782	-294,842
1.17	2.77%	49%	350	-7,448	5,109	147	2,148,239	-67,079	-132,685	-45,175	-244,940	-278,882
1.25	2.85%	46%	325	-6,858	4,902	139	1,885,582	-62,067	-127,729	-42,944	-232,741	-262,657
1.33	2.93%	43%	300	-6,280	4,687	130	1,640,244	-57,146	-122,542	-40,506	-220,194	-245,338
1.42	3.02%	40%	275	-5,712	4,463	120	1,411,411	-52,330	-117,168	-37,904	-207,402	-228,832
1.50	3.10%	38%	250	-5,155	4,231	110	1,199,264	-47,600	-111,576	-35,120	-194,296	-212,148
1.58	3.18%	35%	225	-4,609	3,992	100	1,004,540	-42,955	-105,772	-32,171	-180,897	-194,724
1.67	3.27%	32%	200	-4,072	3,746	89	826,572	-38,406	-99,810	-29,101	-167,317	-177,968
1.75	3.35%	29%	175	-3,545	3,493	77	665,420	-33,935	-93,658	-25,900	-153,494	-161,152
1.83	3.43%	26%	150	-3,027	3,235	66	521,442	-29,540	-87,330	-22,591	-139,461	-143,978
1.92	3.52%	23%	125	-2,517	2,972	54	394,088	-25,228	-80,886	-19,221	-125,335	-127,354
2.00	3.60%	20%	100	-2,014	2,704	42	283,260	-20,978	-74,300	-15,793	-111,071	-110,829

As can be seen in table 1, we assume that interest rates, volatilities, and spreads follow a pattern similar to their dynamics over 2008 and 2009. At the beginning of each month, we calculate the rates, spread, and volatility sensitivity of the CVA. These sensitivities are defined to be the dollar change in the value of the CVA given a 1 basis point increase in the underlying risk factor. We also calculate the CVA at the beginning each month. We then assume that we put on trades for each risk factor equal to the CVA sensitivities to be hedged. We then calculate the change in value of these hedges as well as the change in value of the CVA.

Although the bond-equivalent approach makes the assumption that spread risk hedges are most important, a glance at the results in table 1 suggests that rates and volatility hedges together are generally larger in magnitude than spread hedges. To check another case, we can run the same example for a 5-year receive fixed USD interest rate swap. Results are reported in table 2.

Notional of Swap (\$)	100,000,000
Tenor of swap (years)	5
Forward swap rate	4.60%
Fixed swap rate	4.60%
Current swap rate	4.60%
Swap rate volatility	20%
spread (bps)	100

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Table 2: CVA Hedges on 5-Year Receive Fixed USD Swap															
Year	Swap Rate	swap			Rates			Spread			Vol			Total Hedge	CVA Change
		rate	vol.	Spread	dv01	sv01	dv01	CVA	Hedge	Hedge	Hedge	Hedge	Hedge		
0.00	4.60%	20%	100	-457	424	22	43,895								
0.08	4.43%	23%	125	-625	536	25	69,763	7,618	10,608	6,357	24,583	25,868			
0.17	4.27%	26%	150	-793	643	28	100,944	10,423	13,402	7,394	31,219	31,181			
0.25	4.10%	29%	175	-957	742	29	136,702	13,222	16,064	8,126	37,412	35,758			
0.33	3.93%	32%	200	-1,115	834	30	176,701	15,945	18,543	8,600	43,088	40,000			
0.42	3.77%	35%	225	-1,265	918	31	219,927	18,580	20,859	8,886	48,325	43,225			
0.50	3.60%	38%	250	-1,407	994	31	265,628	21,086	22,959	8,991	53,037	45,701			
0.58	3.43%	40%	275	-1,542	1,062	30	313,864	23,450	24,840	8,943	57,232	48,236			
0.67	3.27%	43%	300	-1,668	1,123	29	363,395	25,701	26,558	8,794	61,053	49,531			
0.75	3.10%	46%	325	-1,785	1,175	28	413,552	27,803	28,066	8,534	64,403	50,157			
0.83	2.93%	49%	350	-1,896	1,221	27	464,906	29,754	29,368	8,176	67,298	51,354			
0.92	2.77%	52%	375	-1,998	1,261	25	515,924	31,599	30,536	7,772	69,907	51,017			
1.00	2.60%	55%	400	-2,090	1,293	23	566,020	33,295	31,516	7,299	72,110	50,096			
1.08	2.68%	52%	375	-1,896	1,202	21	489,826	-17,419	-32,314	-6,769	-56,503	-76,194			
1.17	2.77%	49%	350	-1,710	1,113	19	420,171	-15,797	-30,049	-6,197	-52,043	-69,655			
1.25	2.85%	46%	325	-1,532	1,025	17	356,873	-14,246	-27,819	-5,616	-47,681	-63,298			
1.33	2.93%	43%	300	-1,366	942	15	300,765	-12,766	-25,629	-5,032	-43,427	-56,108			
1.42	3.02%	40%	275	-1,207	861	13	250,364	-11,380	-23,556	-4,481	-39,417	-50,402			
1.50	3.10%	38%	250	-1,057	782	12	205,455	-10,061	-21,532	-3,936	-35,528	-44,909			
1.58	3.18%	35%	225	-917	709	10	166,487	-8,808	-19,562	-3,401	-31,772	-38,968			
1.67	3.27%	32%	200	-785	637	8	132,327	-7,644	-17,718	-2,907	-28,268	-34,160			
1.75	3.35%	29%	175	-661	569	7	102,735	-6,542	-15,936	-2,430	-24,908	-29,592			
1.83	3.43%	26%	150	-545	505	5	77,830	-5,504	-14,220	-1,976	-21,700	-24,905			
1.92	3.52%	23%	125	-437	445	4	56,798	-4,545	-12,634	-1,568	-18,746	-21,032			
2.00	3.60%	20%	100	-336	387	3	39,376	-3,644	-11,119	-1,188	-15,952	-17,421			

The results in table 2 suggest the same conclusion: rates and volatility hedges are at least as important as spread hedges. Yet, the bond-equivalent approach neglects these important risks by specifying a zero coupon bond that captures spread sensitivity primarily.

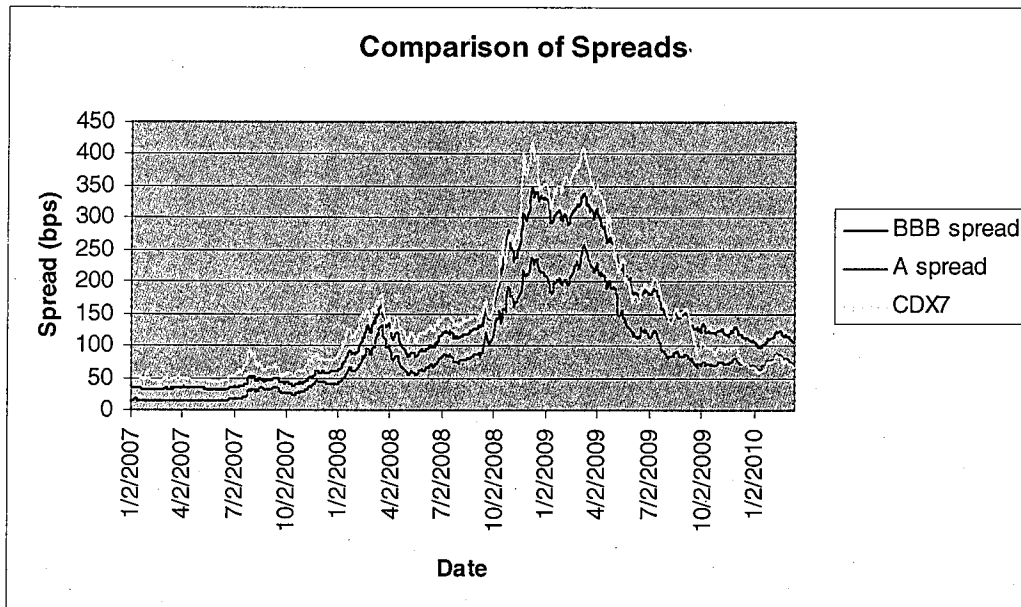
The results in tables 1 and 2 illustrate a key drawback of the bond-equivalent approach. The motivation for the bond-equivalent approach is to promote hedging of the CVA. However, the approach provides no incentive to hedge more than half of the risk of this example trade's CVA. As is apparent in the table, the CVA calculation is designed to hedge the change in value of the CVA to its key risk factors. When done properly, the hedge account will develop a cumulative gain that defrays the cumulative loss recorded in the CVA. However, if the rates and volatility risk are ignored, then CVA losses resulting from rates or volatility changes will accumulate over time and they will not be counterbalanced by cumulative gains in the rates or volatility hedge accounts.

The Committee has recognized the problem of ignoring rates and volatility sensitivity by noting "the extent of CVA losses might be understated by the fact that the value of the notional is held fixed when determining the capital charge." Nonetheless, the Committee feels that this risk will be mitigated since "the notional amount of the hypothetical bond will be updated as EAD changes whenever the capital charge is calculated for regulatory purposes." Tables 1 and 2, however, suggest that this risk will not be mitigated. The notional of the CVA itself is updated as market rates change and the spread hedges are calculated with respect to that updated notional. But if the rates and volatility hedges are not included, then cumulative changes in CVA resulting from these risks will not be hedged properly.

As currently formulated, the bond-equivalent approach would provide incentives to hedge the CVA using name-specific default swap hedges. During a financial crisis, name-specific hedges may become more illiquid. Rates hedges, on the other hand, can be achieved using very liquid products, such as interest rate swaps, swaptions, equity swaps, etc. Thus, it would seem important to encourage the use of liquid products to hedge the CVA. In fact, the widespread use of liquid products to hedge counterparty credit risk could serve to reduce systemic risk during a financial crisis. The bond-equivalent approach provides no such incentive.

Systemic risk could also be reduced by encouraging spread hedges as well. At present, the bond-equivalent approach would provide capital incentives to hedge using name-specific credit hedges but would provide no such incentives for using index hedges, which are more liquid. For counterparties in the process of defaulting or whose credit quality has deteriorated much more substantially than the average counterparty, name-specific hedges are important to hedge the spread risk. But most counterparties have much more average credit spread behavior over the course of an economic cycle. In these situations, spread risk can be substantially hedged by using index products, since index spreads are highly correlated with individual spreads. Chart 4 illustrates the correlation between BBB and A spreads and the CDX7. Indeed, index spreads can hedge the systematic component of the CVA spread risk. And since index hedges are generally much more liquid than single-name spread hedges, the use of index hedges is an important tool to reduce systemic counterparty credit risk during a financial crisis.

Chart 4



For CVA calculations on counterparties with credit derivative portfolios, it may be particularly important to use index hedges. The CVA of a credit derivatives portfolio depends on the spreads of the underlying credit derivative names in the portfolio, which are likely correlated with the spread of the counterparty itself. The use of index spread hedges may be a particularly convenient method for addressing this correlation using liquid products.

Burden on Banks of Bond Equivalent Approach

Since the bond-equivalent approach relies on quantities already calculated for Basel II regulatory capital purposes, it would seem that the incremental burden of calculating bond-equivalent VaR would be low. However, it is important to distinguish between the burden of calculating the new number and the burden implied by the marginal costs the proposal will impose on firms in the process of developing a CVA model.

Since bond equivalents are in general not equivalent to CVA, firms with more sophisticated CVA models would face the regulatory-created incentive to optimize hedges between the true CVA model and the regulatory CVA model. Firms with sophisticated CVA models might just decide not to optimize and pay the regulatory cost. Or, depending on the cost of capital, they may have the incentive to optimize. In the case of a sophisticated firm, the cost of the CVA development has already been borne and they just need to decide how to manage essentially two CVA models. But a less sophisticated firm will confront a very different problem. Faced with the eventual burden of running two CVA models, it may decide that it is more efficient to develop an internal CVA model that is similar to the regulatory CVA model. If this firm calculates capital under assumptions that are not consistent with the correct CVA calculation, the internal CVA model created would tend to mislead the firm on the nature of its mark-to-market counterparty risks, the opposite of what the bond equivalent proposal is trying to achieve.

Adjustment of EEPE Regulatory Credit Capital Calculation

The bond-equivalent proposal is designed to capture the mark-to-market counterparty credit risk in a portfolio. Yet, the Basel II regulatory capital formula already has a mark-to-market adjustment built into it by means of the Basel maturity adjustment M. As explained in the July 2005 BIS publication “*An Explanatory Note On the Basel II IRB Risk Weight Functions*”, the maturity adjustment (“M”) was calibrated to a one-year horizon credit mark-to-market simulation by means of the KMV Portfolio Manager model. For derivative portfolios, the maturity adjustment M is already capturing the CVA risk. Since the bond-equivalent proposal does not include the elimination of the Basel maturity adjustment, it would count the CVA risk twice.

To get a sense of the magnitude of the potential double counting, we consider a simple portfolio comprised of 1000 BBB-rated counterparties, all of whom have a single trade in their portfolio--the 10-year USD \$100 million USD interest rate swap we have already examined. We assume that interest rate volatility is 20% in order to compute EEPE and that there are no CVA hedges. We use 18 basis points for the probability of default, the 1983-2008 1-year Moodys average for a BBB-rated counterparty. We also assume that LGD is 65%. Table 3 shows the regulatory capital calculations.

Table 3	
Capital	197,626,568
Default Only Capital	86,759,696
Maturity Adjustment	110,866,872

Total credit regulatory capital for this portfolio would be \$198 million. Excluding the maturity adjustment, total capital would have been \$87 million, implying a mark-to-market add-on of \$111 million implicit in the current Basel II capital formula.

To compare this add on to the proposed bond-equivalent VaR add on, we use a simple linear VaR model in which we specify a bond-equivalent notional equal to EEPE of the trade with a 5-year maturity. We assume spread correlation is 40% and calculate VaR for a range of typical BBB credit spreads between 50 and 100 basis. Using an average BBB spread, we calculate a volatility of 32%. Tables 4 reports the results.

Table 4						
Spread (bps)	50	60	70	80	90	100
Spread Correlation	40%	40%	40%	40%	40%	40%
Volatility	32%	32%	32%	32%	32%	32%
99.9% 1-year VaR	68,361,905	82,034,286	95,706,667	109,379,048	123,051,429	136,723,810

The results in table 4 suggests that under ordinary circumstances the mark-to-market adjustment already built into the Basel II formula covers the proposed bond-equivalent risk fairly well. These results are not surprising given the calibration done by the regulatory community to ensure that the maturity adjustment is quantitatively reasonable. But, the results do serve as a reminder that CVA mark-to-market risk has already been included in the current framework. Of course, during a stressed environment in which the level of spreads or volatilities is larger, particularly for firms that are using risk-neutral exposure models, the bond-equivalent add on could be larger than the mark-to-market maturity adjustment add on in the Basel II formula.

Thus, if CVA is included in VaR, it seems reasonable to remove the maturity adjustment in the EEPE framework, i.e., M should be set to 1. The Basel capital formula, with $M = 1$, could then be modified to capture residual jump to default risk. By itself, the formula with $M = 1$ will capture the 99.9% default-only risk of the portfolio. The default risk measured, however, will include the full loss and will not have adjusted for mark-to-market losses already accounted for by the CVA. Accordingly, the EEPE formula could be adjusted by removing the subtraction of expected loss and instead subtracting the realized CVA, as we will propose below.

Conclusions and Recommendations

The Committee's proposal to include CVA risk in capital represents an important step forward in encouraging the more widespread use of a powerful counterparty risk management tool. However, the specific approach advanced, the bond-equivalent methodology, suffers from a number of drawbacks that will not only limit its ability to strengthen the banking system but will also weaken it in some respects. The proposal, because it is based on regulatory capital calculations, will introduce inconsistent hedges and capital treatment of CVA across banks. There is no need for this inconsistency, however, since the calculation of the CVA should be relatively invariant across banks when done according to well-understood financial theory. However, the bond-equivalent approach is too different from the CVA calculation to enforce consistency.

One consequence of these differences is that the bond-equivalent approach provides no incentives to hedge market risks, important risk factors that can be mitigated using liquid instruments. The bond equivalent approach also provides no incentives to use liquid index instruments to hedge the systematic component of the CVA spread risk. Current regulatory policy penalizes CVA hedging since CVA hedges attract market risk capital but CVA hedges are not naturally counterbalanced by CVA risk. Unfortunately, the capital disincentives to hedge rates, volatility, or systematic credit risks are not addressed by the framework. Thus, the proposal misses an opportunity to encourage an extremely important counterparty risk-mitigation technique. Instead, the approach will create complex new incentives and potential unintended consequences that may well retard firms' progress in developing better risk management practices

Of course, the severity of the consequences of the bond equivalent approach on firms' risk management will depend on how advanced their CVA calculation currently is. If a firm already performs a robust CVA calculation, the proposal may provide incentives to move away from that calculation or, at the very least, introduce complex incentives to optimize the hedges of two competing CVA measures. For firms that are working toward a robust CVA calculation, the proposal may discourage further progress. On the other hand, for firms with weak or non-existent CVA calculations, the proposal, despite the flaws inherent in a simplified approach, may well encourage better risk management standards than is the current practice.

A better solution than a one-size-fits-all approach would be for the regulatory authorities to permit a more sophisticated firm to put its CVA calculation in VaR, subject to regulatory approval of the firm's CVA model. While the regulatory authorities may be reluctant to discriminate among firms' CVA methodologies, it should be noted that the supervisors already review firms' exposure models and risk practices. Indeed, differentiation of capital treatment between banks based on risk management sophistication is already part of the Basel II process. For banks which cannot qualify for an internal CVA approach, a simplified approach could be used. The advantage of this solution is that it would encourage the movement toward consistency of capital treatment of CVA risk by providing regulatory capital benefits for developing more robust risk management practices, just as the Basel II process does today.

For firms that do have a robust CVA process, the existing EEPE framework is inconsistent with the counterparty credit risks the firm experiences, since it treats credit risk from an essentially non-mark-to-market point of view. The CVA methodology transforms long-term counterparty credit risks into short-term market risks. Thus, to the extent that CVA fully captures the risk, capital for these risks should be assessed in the market risk framework--the EEPE framework is superfluous.

While we support the full capitalization of counterparty risk in the market risk framework, we recognize that the regulatory community may be hesitant to move to such a methodology immediately. Accordingly, we would support an interim methodology that could combine the EEPE framework with VaR in a way that would reflect the comments we have made. To account for potential model risk and illiquidity, and to maintain a suitable level of conservatism, we propose a possible modified EEPE methodology for firms that receive permission to put CVA in VaR, with the understanding the other proposals might be acceptable as well. The proposed hybrid methodology would consist of the following formula for capital K:

$$K = \sum_{i=1}^N \alpha * EEPE_i * LGD_i N[(N^{-1}(PD_i) + \sqrt{RN^{-1}(.999)}) / \sqrt{1+R}] - CVA_i + F(CVA)$$

where

$EEPE_i$ = effective expected positive exposure of the i^{th} counterparty

LGD_i = loss given default of the i^{th} counterparty

R = Basel correlation

CVA_i = current asset-side CVA

α = multiplier between 1.2 and 1.4

and

$F(CVA)$ = standard 10-day market risk capital charge for CVA

Note that the first term in this formula is the Basel default component multiplied by alpha with the maturity adjustment and the subtraction for expected loss removed. This component of the formula would capture default risk over a 1-year horizon, with alpha playing the role of adjusting for potential wrong-way risk, model risk, and concentration risk. Since we are using a mark-to-market framework, we subtract the current asset-side CVA rather than the expected loss to adjust for credit loss already taken in P&L. Finally, to measure mark-to-market risk, we add on the standard 10-day market risk capital charge for CVA.

The bond equivalent approach, of course, proposes that CVA be put into VaR at a 1-year horizon. However, CVA is a short-term risk that can be calculated and hedged daily and is therefore essentially no different from other market risks. There is no reason to treat CVA risks differently from other market risks and we would propose that it be treated in VaR in the same manner as all other market risks. Indeed, it is important to treat it equivalently to other market risks in order to encourage proper hedging.

In order to promote full hedging of the CVA, all applicable hedges --rates, volatility, and index hedges—should be put in VaR along with the CVA. CVA and its hedges would be allowed to offset or increase other market risks, just as any market risk would.

For firms which do not receive permission to put CVA in VaR, a simplified methodology would indeed be appropriate. To encourage the proper incentives, it would be important to insure that the simplified add-on is as much like the CVA as possible. Thus, rather than using a bond-equivalent approach, it would be more accurate to require the firm to calculate the term structure of expected exposure using expected netting. Given the term structure of credit spreads, it would be relatively straightforward to calculate sv01 at various horizons over the life of the trades. Those sv01s could be put into the firm's VaR model and run at the 99% confidence level over a 10-day horizon. In this case, firms should be allowed to include name-specific as well as index hedges in the VaR calculations. Because this calculation will include marked-to-market risk, a firm using the simplified approach should be allowed to remove the Basel II maturity adjustment from the regulatory capital calculation, i.e.,

set $M = 1$ in the Basel capital formula. In this case, the capital charge would consist of the standard Basel capital charge with M set to 1 plus a multiple of the 10-day simplified CVA VaR that would be calibrated to be consistent with the removed maturity adjustment.

This alternative approach is almost as simple to implement as the bond-equivalent methodology. But it has the advantage that it is much more like the true CVA calculation. Importantly, it will provide incentives for the firm to move to a more robust CVA calculation, since in that case it will be allowed to include rates and volatility hedges as well as to subtract the CVA rather than expected loss.