Basel Committee on Banking Supervision Consultative Document

The non-internal model method for capitalizing counterparty credit risk exposures

Dated June 2013

The International Swaps and Derivatives Association, Inc.

The Global Financial Markets Association

And

The Institute of International Finance, Inc.

Industry Response

27 September 2013

1. Executive Summary

The Associations[1] welcome the Basel Committee's Paper as a significant step in the right direction and believe that the proposed non-internal model method (NIMM) framework has great potential. As an alternative to the current exposure method (CEM), it is clear that NIMM performs significantly better as a measure of exposure.

However, there are certain situations where the proposed NIMM is unable to capture some collateral and netting arrangements thus resulting in disproportionately high levels of exposure. Preliminary analyses have shown that it will not be possible to differentiate these issues from those of overly conservative calibration using the multiple quantitative impact studies. We therefore suggest that additional time be allotted by the Basel Committee to further evaluate NIMM and perform additional empirical testing on real portfolios. The Associations' members are ready and willing to engage further on this.

Embedded in these concerns are several "principles" that the industry feels are important to discuss further with the Basel Committee:

- There appear to be several assertions and design choices made that the industry feels err towards being overly simplistic. We fully appreciate the desire for simplicity, but we find it incongruous that a regulated firm that has the ability to engage in derivatives activities would not be permitted to reflect a higher degree of accuracy in the calculation of its capital requirements, even if it is within the scope of established concepts and framework and does not introduce unwarranted degrees of firm specificity.

- The industry also seeks confirmation from the Basel Committee that the parameters of the proposed NIMM can and should be adapted to the given context. For example, given the high degree of overcollateralization of clearing members to CCPs, the hypothetical capital construct using NIMM might well be dominated by the floor on the multiplier in NIMM. This would be counter to the need to balance carefully, through an appropriate degree of risk sensitivity, the trade-off between initial margin and guaranty fund at CCPs.

- Although we greatly respect the careful thought and effort put into the proposed NIMM framework, in one sense it is just one half of the equation. To that end, we would welcome a methodology paper elaborating the calibration and parameterization of NIMM. This would help us provide a better informed response to enhance the consultation process.

In addition, the industry remains concerned about the use of NIMM (as well as CEM), or scalar multiples thereof in the wide range of applications currently considered by the Basel Committee or national supervisors (e.g. leverage ratio, standard portfolio initial margins for non-cleared derivatives, CCP hypothetical capital, large exposure framework, etc.). It will remain important to consider the pros and cons of NIMM through at least three distinct perspectives in each instance: (1) the absolute value and volatility of the metric; (2) the opportunity to arbitrage the result of the metric; and (3) the behaviour of the metric going into the next financial crisis as firms and their counterparties execute prudent risk management measures. However, we would welcome acknowledgement from the Basel Committee that this is an important next step, and critically, one that needs to be articulated transparently to all regulators and across the industry.

[1] The International Swaps and Derivatives Association, Inc., The Global Financial Markets Association, and The Institute of International Finance, Inc.

In the area of reducing arbitrage opportunities, the industry recognizes the desire for simplicity, but feels strongly that NIMM suffers from not reflecting the effects of ageing on the portfolio for certain products. For example, it is straightforward to eliminate NIMM exposure on a portfolio of FX trades through executing spot transactions. To counter this, the industry recommends that NIMM be calculated on a forward basis for a number of time buckets extending to the 1yr capital horizon, and either an average or maximum across time buckets be used to represent the overall NIMM. This can be done within asset class, or across asset classes.

Another aspect of the NIMM framework that the industry feels is important is an articulation of supervisory standards for notional definition and asset class classification that will allow firms to reliably and consistently apply NIMM to the vast majority of derivative structures. We urge the Basel Committee to do this to help ensure global consistency. The Industry is willing to help and contribute to the definition of notionals, it is currently initiating discussions on the topic and aims at developing a proposal at the beginning of the fourth quarter 2013.

Finally, smaller firms may need time to adapt to the proposed NIMM framework. Consequently, we think that the BCBS should allow the option to use a simplified version of NIMM, subject to supervisory review.

Below, we set forth some of the major technical concerns we have with the NIMM, as well as responses to the consultation questions. We respectfully request that the Basel Committee consider the industry's recommendations. We would, of course, be pleased to answer any questions you have about our submission.

2. Technical Observations

2.1. Alpha Multiplier and Time Risk Horizon:

One of the original aims of the alpha multiplier was to provide a means of conditioning internal estimates of EPE on a "bad state" of the economy consistent with the determination of credit risk in the capital framework, whilst reflecting concerns around general wrong way risk. However in NIMM this is, to a greater extent, explicitly addressed by the calibration of the Supervisory Factors based on markets during a stress period. Separately, the alpha multiplier is also viewed as a method to offset model error or estimation error. NIMM is not subject to this type of model risk to the same extent as internal model methods ('IMMs'), despite the calibration to be comparable to IMM. Errors introduced through the simplification assumptions are covered by the conservatism added elsewhere in the methodology. In recognition of all of these facts, for capital calculations, we propose alpha should be set at the IMM floor of 1.2.

For other uses, as noted elsewhere, calibration of all parameters including alpha should be re-addressed. In particular, we believe that alpha should be set to one for use in Large Exposure where the intent is to measure the propensity for concentration (not assume it, as is done when using the alpha factor), and in the Leverage Ratio where, again, the intent is to measure the propensity for firm and systemic leverage (neither of which is reflected by the alpha factor, and so constitutes an excessively conservative calibration). Additionally, if used for CCPs, it would work against the principle of making central clearing attractive relative to bilateral trades, as we explain in our response to Question 1 below.

It also occurs to the industry that the application of the alpha factor to fixed exposure amounts (such as day-zero mark-to-market, collateral posted in base currency, or thresholds denominated in base currency) does not reflect the economic risk and is an overly and unnecessarily conservative approach.

Separately, but not entirely unrelated, the industry remains concerned with the 3/2 multiplier in the time risk horizon adjustment. Should a firm engage in 1yr derivatives with margining based on a year-long period of risk, there should be no difference in the economic exposure, yet the formula as specified results in margined exposure 50% bigger than the unmargined. The 3/2 may be justified under a discrete set of conditions relating to a normal distribution and a 10-day period of risk, but it does not capture the relationship between tenor of margining, or indeed tenor of derivative where the derivative maturity is less than 1yr. The industry considers that a profile of exposure provides the means to avoid some of the complexity and overt conservatism introduced by the 3/2 multiplier. Certainly, the application of both an alpha multiplier and the 3/2 multiplier ensures that NIMM will err significantly away from IMM and be less credible as a standardised alternative.

2.2. Replacement Cost ('RC'):

Problems with the RC calculation in NIMM

The NIMM RC calculation implicitly assumes that a collateral group and a netting set are identical, i.e., if a set of trades with a counterparty is in a collateral group for which margin is calculated, then the value of those trades will net upon bankruptcy of the counterparty. When this assumption is satisfied, the definition of RC in NIMM as the value of the trades in the netting set minus the net collateral will not in general present any special difficulties. However, if the terms of the collateral agreement such as the threshold, the minimum transfer amount, and/or the initial margin is non-zero, the definition of NIMM must be modified.

Issue of large thresholds

For collateralized exposures, the RC term in NIMM is defined as:

$$RC = \max(V - C, TH + MTA - NICA, 0)$$ [2]

The motivation for this definition is that even if a counterparty is margined, the exposure can get as large as the threshold plus the minimum transfer amount minus any initial margin held before margin will be collected from the counterparty. Since that exposure will also include the current exposure, RC can be as large as TH + MTA - NICA.

While this analysis is true in general, the exposure will be overestimated by this definition of RC if the threshold is set at a very high percentile of exposure. For example, it may happen that a netting set contains trades with large exposures and therefore the threshold in the collateral group was set appropriately high. Subsequently, however, if most of the trades rolled off or were changed, but the collateral threshold has not been adjusted, the threshold may be much larger than the potential exposure of the current trades in the netting set. In this case, the RC formula will overestimate the exposure substantially. Alternatively, risk managers may sometimes set a very high threshold in order to collateralize event tail risk. The RC formula will then significantly overestimate the exposure, dis-incentivizing risk managers from protecting against tail risk. To avoid this overestimation of exposure and the consequent creation of perverse incentives, we suggest capping the RC term with the uncollateralized exposure, since it is generally true that an uncollateralized exposure will serve as an upper bound on collateralized exposure measured by TH + MTA - NICA. Details can be found in technical appendix 2.

Collateral allocation rules

RC is not defined in NIMM for more complex relationships between netting sets and collateral groups. If the formula for RC is used without modification in these more complex situations, very serious errors in estimation may occur. A not uncommon situation is depicted in Figure 1.

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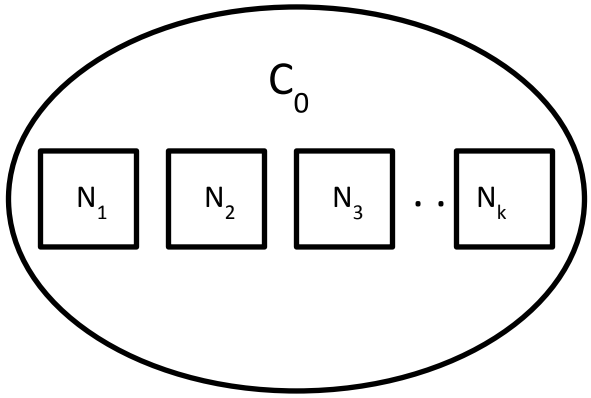
[2] Where:

- V is the value of the derivative transactions in the netting set,
- C is the haircut value of net collateral held,
- TH is the positive threshold before the counterparty must send the bank collateral,
- MTA is the minimum transfer amount applicable to the counterparty,
- NICA is the net independent collateral amount, i.e. the amount of collateral that a bank may use to offset its exposure on the default of the counterparty.

Figure 1



In Figure 1, there are k netting sets that are all contained in collateral group C_0. C_0 has threshold TH and minimum transfer amount MTA. For collateral purposes, the collateral that covers the k netting sets would be calculated assuming that all trades in the collateral group net with each other, even if they do not net at the netting set level. Thus, collateral is calculated on the mark-to-market (MTM) value of the trades in all netting sets while exposure is calculated by netting set, since netting sets reflect a legal opinion on whether trades will be allowed to net in bankruptcy court. Netting sets may differ from collateral groups.

In appendix 1, we discuss in detail how the application of the RC formula for NIMM will significantly misestimate the risk if there is more than one netting set in a collateral group. We suggest how the formula for RC in NIMM as well as the multiplier should be extended to handle this case. We also discuss more general relationships between netting sets and collateral groups for which NIMM is also undefined and suggest a more general methodology for RC for this case. Appendix 2 contains a precise, technical discussion of the modifications to RC and the multiplier that we propose.

We strongly urge that the definition of RC be extended along the lines we suggest in appendix 2. Although the RC formula can be unambiguously used in the case when there is more than one netting set in a collateral group, very significant errors in estimation can occur. For more complex relationships between netting sets and collateral groups, it is not clear how to use the RC formula. Quantitatively, the aggregate effect of failing to adjust for multiple netting sets in one collateral group depends on their prevalence in a bank's portfolio. While the effect is likely to vary across banks, one bank estimated that its aggregate NIMM exposure would increase very significantly as a result of failing to extend the RC in NIMM to the case of multiple netting sets in a collateral group.

Application of both IMM and NIMM

If banks apply IMM for certain derivatives and NIMM for others, netting sets are split into two parts. We would welcome the possibility for banks to apply excess collateral across approaches in such cases, or to apply the benefit from the negative replacement value in one partial netting set against the positive replacement value in the other partial netting set.

For example, if a bank has a negative replacement value (‘NRV’) of 100 from a derivative under IMM and a positive replacement value (‘PRV’) of 90 from a derivative under NIMM, 90 of the NRV of 100 could be used to offset the PRV under NIMM. In such case, the IMM calculation would have to be adjusted to only recognize an NRV of 10.

2.3. PFE AddOns:

2.3.1. Multiplier: (Recognition of excess collateral and negative mark-to-market)

The assessment of portfolio risk using only Replacement Cost and at the money AddOn through the multiplier formula is a good solution to take into account moneyness effect and over collateralization.
We understand that multiplier is derived from theoretical value of the expected positive exposure of a portfolio with a normally distributed mark-to-market ('MtM').

In this context we question the usage of the proposed approximation:

$$E(\max(0; x)) = \max(0; x0) + \exp\left(\frac{-abs(x0)}{2 * \frac{\sigma}{2 * \pi}}\right) * \frac{\sigma}{2 * \pi} \qquad \text{Formula (2.3.1.1)}$$

Rather than the option price formula:

$$E(\max(0; x)) = \mathrm{x0} * \mathrm{N}\left(\frac{\mathrm{x0}}{\sigma}\right) + \sigma * g\left(\frac{\mathrm{x0}}{\sigma}\right) \qquad \text{Formula (2.3.1.2)}$$

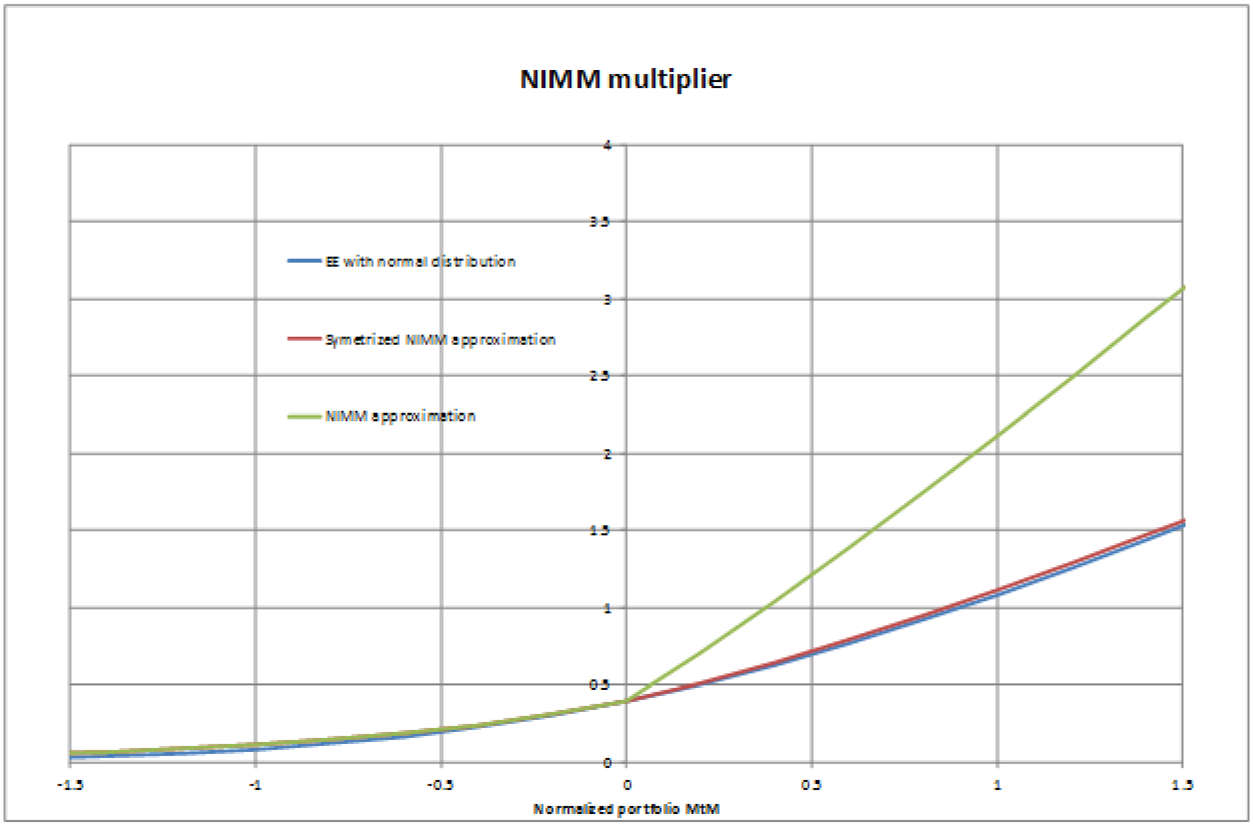
Where x is supposed to be normally distributed with mean x0 and standard deviation σ and g(u) while N(u) are respectively the probability and the cumulative probability of the normal law. In consultative paper term x0=V-C and σ =AddOn.

We suggest using Formula (2.3.1.2) for 3 reasons:

- Implementation of formula (2.3.1.2) is as easy as formula (2.3.1.1) in every software
- Formula (2.3.1.1) introduces some conservatism (see graph below) which will be added to proposed 5% floor and other prudent calibrations of parameters. We suggest not adding this new conservatism in favor of an explicit and well defined mechanism all the more since under the new regulations firms may be required to post initial margin ('IM') bilaterally in order to mitigate counterparty credit risk. This should be sufficiently reflected in the reduced exposure
- Formula (2.3.1.2) could be used to define a normalized delta for options[3]

More importantly, the consultative document proposes to floor the multiplier to 1 for portfolios with positive MtM. As depicted in the next graph the estimation of AddOn following BCBS 254 would be the green line where coherent value, within the retained framework, would be the red line. **We think that a symmetric multiplier, or more simply the Formula (2.3.1.2), for in the money portfolio should be used.**

[3] To replace supervisory deltas which could lead to dramatic over or under estimation of risks Formula (2.3.1.2) could be used to defines a standardized delta. Knowing an option price and using supervisory volatility σ with equation $\frac{Option\ Price}{N*\sigma*\sqrt{T}} = \mathrm{X} * \mathrm{N}(\mathrm{X}) + g(\mathrm{X})$ we can assess option moneyness X and a standardized delta as N(X). A vlookup table could be used to avoid solving the equation.



Eventually some conservatism could be introduced using the same mechanism as for the 5% floor.

NB: the Industry understands that the (1+Floor) is an inconsistency and should read as (1-Floor) instead. A comparative study of multipliers illustrating this issue can be found in Appendix 3.

2.3.2. Cap on PFE:

There are many structures for which a maximum loss principle can be applied. For example, unmargined bought protection, a portfolio of only sold options, or those structures whose future cashflows are known and defined today. The industry feels that, to ensure globally coherent regulatory standards in implementation, it would be prudent to adopt and articulate a maximum loss principle at the transaction or structure level.

2.3.3. Correlations:

We understand that correlations between asset classes are unstable and tend to diverge towards 1 and -1 at times of significant markets stress.

We believe however correlations should allow for diversification benefit under NIMM in the following instances:

- Within the assets class "interest rates" between different currencies
- Between currency pairs, to avoid the unrealistic event of every currency moving adversely.

We also think that the NIMM framework should use appropriately calibrated correlation levels across broad risk classes (interest rates, foreign exchange (FX), equity, credit, commodities), in cases where the assumed diversification benefits could disappear, with hedges no longer functioning as intended. These supervisory correlations would naturally reflect an increased degree of conservativeness of the NIMM framework when compared with firms' current internal models.

2.3.4. Maturity Adjustment in effective notional:

Scaling notional by maturity for IRS and credit derivatives is crude and overstates risk. This would be particularly penal for swaps. We believe the maturity adjustment scaling should be based on modified duration, which is a significantly more accurate and risk-sensitive measure than the outright maturity.. We propose a modified Duration Look-up Table in appendix 5.

Furthermore, the proposed maturity adjustment will punish most corporate trades that are long dated and unidirectional (no benefit for offsetting to be expected in these cases). Manual calculations show increases in exposure at default ('EAD') by a factor of 5 compared to current CEM as well as IMM. A quick analysis for IRSs shows that an AddOn of 0.2% per year could be more in line with more sophisticated models (Appendix 4).

Finally, the Industry believes that Regulators need to consider the fact that there is a significant knock-on effect in the standardized CVA capital if AddOns for IRS are conservatively measured.

2.3.5. Maturity Mismatches:

Another simplification which could lead to under or over estimation of Effective Expected Positive Exposure ('EEPE') using NIMM AddOns is the treatment of transaction's expiry mismatches.

For example a straightforward FX swaps will show almost no exposure at default, as the short leg will almost completely be compensated with the long leg. This means that a FX swap where the short leg matures in 3 days time and the long leg in 1-month time will not show any exposure for the first 3 days. We would favor seeing risks immediately from the moment trades are entered into the systems. This effect should be suppressed in one way or another.

In the following table we show the EEPE value for a 1-year long position (at the money forward with effective notional equal to 100) and a second position with effective notional given in first column and maturity given in first line. In last column is the corresponding NIMM AddOn.

	EEPE								NIMM
	1 week	2 weeks	1 month	2 months	3 months	6 months	9 months	1 year	
30	0.02	0.04	0.08	0.17	0.25	0.50	0.75	1.00	
-500	55	77	108	184	227	292	322	331	267
-250	30	30	40	91	112	145	160	164	100
-100	**30**	29	28	35	44	57	63	64	0
-50	30	30	29	19	23	29	32	33	33
-20	30	30	30	24	24	24	24	24	53
-10	30	30	30	27	27	27	27	27	60
0	30	30	30	30	30	30	30	30	67
10	30	30	30	33	33	33	33	33	73
20	30	30	32	36	36	36	36	36	80
50	30	30	40	45	45	45	45	45	100
100	**30**	39	54	60	60	65	71	73	133
250	48	68	94	105	118	150	166	170	233
500	82	116	162	188	232	297	327	336	400

A global long position with average maturity lower than 1-year has an EEPE which could be far less than what is proposed in NIMM (underlined green cells).

On contrary a long term position hedged by a short term position with same effective notional will have a zero NIMM AddOn when EEPE should be almost equal to the single long position (underlined red cells).

To avoid such under or over estimation **we suggest requesting banks to compute a risk profile** and to apply the same rules as for IMM. In IMM, to address the concern that “Expected Exposure” (EE) may not capture rollover risk or may underestimate the exposures of OTC derivatives with short maturities an “Effective EE” is defined recursively as:

$$\text{Effective } EE_{tk} = \max(\text{Effective } EE_{tk-1}, EE_{tk})$$

where exposure is measured at future dates t_1, t_2, t_3, … and Effective EE_{t0} equals current exposure. “Effective EPE” (EEPE) is the average of Effective EE over the first year. If all transactions in the netting set mature within less than one year, Effective EPE is computed as a weighted average of Effective EE.

For that, the NIMM determination of aggregate AddOns should be done for different time horizons (for example 1-day, 2-weeks, 1-month, 3-months, 6-months, 1-year) in each computation taking into account only non matured transactions at this time horizon.

For **non margined portfolios,** a time horizon AddOn would be computed multiplying the regulatory 1-year value by the square root of corresponding time horizon.

With a small number of time horizons, profile for trades maturing between 2 time horizons will be truncated. We suggest, for trades maturing within 1-year, a nominal adjustment such as multiplying trade nominal amount by a function of the ratio of the trade maturity over the largest time horizon capturing the trade. For example nominal amount of a 7-months trade would be multiplied by square root of 7/6 because risk profile for this deal will be truncated at the 6-months time horizon.

For **margined portfolios** the time horizon AddOn should be computed using the corresponding supervisory holding period. The a priori non increasing deal profile will no require any nominal adjustment for truncation correction.

NB : In this case regulatory AddOns should be defined as 1-year underlying volatility, not applying the 3/2 coefficient which is introduced in the consultative document to take into account the averaging of implicit profiles.

Additionally to the possible avoidance of regulatory arbitrage offered by the current proposal in the consultative document, the usage of a profile would have at least two other advantages:

- **Maturity adjustment**

In the consultative document AddOns are not taking into account deal maturity[4]. This is correct for operations having a maturity over 1-year but could be very conservative for short term deals. For example, the short-term exposure for FX forwards is not recognized. While there is roll-over risk, the MTM reset of the rollover leads to reduced exposures that should be recognised. Therefore the AddOn for short-term FX transactions should be lower than those of FX transactions with tenors over one year. The computation of a risk profile as described above would correct this approximation.

- **CVA charge**

One of the most conservative impacts for computation of Var on CVA using standard method or the flat profile one is the usage of average maturity of portfolio floored by half of the maturity of the trade having the longest one in the portfolio. Following the logic of building a profile using different time buckets, this could be done up to the portfolio maturity. In this case banks would have the choice to use the advanced method.

2.3.6. Notional and Delta Definitions:

The notional, adjusted notional and delta concepts are clearly linked in their objective of arriving at a value of exposure to be replaced if the counterparty defaults. The definition of notional was never clearly defined for CEM either and although we understand the desire to limit the divergence between firms we also feel that over simplification in this area may lead to undesirable outcomes in some cases.

In some cases, e.g. a vanilla swap, notional and delta can be clearly defined, although in the case of a basis swap or floating versus floating swap the sign, or delta, of the exposure may be less clear. In other cases however the notional may even be unclear. We cite some examples of trades where either notional or delta may be problematic.

- Structures with digital payoffs, noting this could be addressed partly through the maximum loss principle.
- Structures embedding call features, respecting the difference between where the firm is long or short that option.
- Structures that embody a spread; floating-floating swaps within and across asset classes as considered by NIMM.
- Structures that are based on a basket of underlying assets.
- A variable notional swap where the notional is reset after a payment, for example in response to the change in a specific equity index over a given interval. This swap is basically designed to

[4] Indeed interest rates or credit products are using trade maturity, but it is as a proxy for duration, not for assessing the maximum risk within the 1-year time bucket.

replicate the changing value of an underlying basket of stocks, whilst, at the same time, taking into consideration the cost of funding this basket and the dividends received on its components.

- Accreting/amortizing swaps: the notional will accrete/reduce over a predetermined schedule with a given mechanism. Inflation swaps are a good example.
- Target redemption forwards: periodic cash flows are calculated as the payoff of a vanilla option the notional of which depends on a condition being realized i.e. there is embedded leverage. Pay off gets more negative for the counterparty by inflating the notional it applies to.
- Leveraged spread options e.g. structured coupons are defined as a multiple of the rate spread between the 30y and the 10y swap rates.

We believe that the concept of notional should be constrained only to the quantity of units of a position: number of contracts, barrels, equities, bonds while delta conceptually should be linked to price movements. Under this concept, a MtM valuation of a swap might be used as the price while the notional would then be simply 1.

For linear products a delta would be +1 where an increase in the price leads to a mark to market gain and a delta of -1 would be used where an increase in the price leads to a loss. However where the mark to market of the position does not move linearly with the price of the underlying then forcing a linear relationship, for example applying a static delta of 0.5 to an option on some underlying will render the PFE on occasions too volatile. This would be particularly the case for very out of the money options.
Note also that if a very in the money option still attracted a 0.5 delta while a hedge in the underlying would get -1 then this could result in an incentive to buy in the money options instead of the underlying. Also, for instance, a straddle structure leads to zero exposure, while under the proposals both exposures would be added.

To overcome these issues a proper delta adjusted price, $\delta * P$ where δ is based on a valid option pricing model would deliver appropriate responses.

We know that regulators could have some reluctance to use bank's deltas. Our opinion is that the ability of firms to calculate delta should not be in doubt and indeed regulators approve delta calculations in the market risk framework. Indeed the recent consultation paper 5-13 from the PRA, contemplates approving firms calculating their own deltas for standard rules. In the interests of regulatory consistency and in the spirit of BCBS258 we suggest regulators should rely on the ability of firms to compute delta for counterparty risk also. We would note that delta of an option is a pricing model parameter tested in the market through trading and marking to market.

Although we have identified some problems here and made some preliminary attempts at solutions we believe more time is needed to thoroughly consider the notional/delta/price clarifications and would welcome an opportunity to work further with regulators on this, beyond the response deadline for the consultation.

As mentioned in the executive summary, the Industry is willing to help and contribute to the definition of notionals, it is currently initiating discussions on the topic and aims at developing a proposal at the beginning of the fourth quarter 2013.

Finally, we note that a tranched CDO supervisory delta adjustment is mentioned in the NIMM paper. However, a tranched CDO is defined as a securitisation position under the existing Basel rules which then further define the exposure and RWA requirement for a securitisation position (as the credit risk of the underlying asset). As a result, there is no counterparty credit risk that should be added onto this. We would welcome clarification on the reasoning according to which NIMM includes a tranched CDO supervisory delta adjustment, implying counterparty credit risk for securitization positions.

2.3.7. AddOn for FX derivatives:

The simplified treatment proposed in the consultative document for FX derivatives is very conservative. We suggest using the same framework as for equity or commodity products. The FX portfolio should be treated as a basket of assets against the bank reporting currency.

For that, netting of long and short positions coming from the different FX trades should be netted by currency using the proposed modified delta approach described above to compute an AddOn by foreign currency. For example a GBP/USD trade for a bank reporting in EUR should be decomposed as a long position in GBP and a short position in USD.

At the end a formula such as the one proposed in paragraph 70 could be used to take into account correlations which should not be systematically equal to 1.

2.3.8. AddOn for Unmargined Credit Derivatives and Options:

We note that where for most asset classes long and short positions give similar risks, this is certainly not the case for unmargined credit derivatives and options, where there is a considerable asymmetry between the risk of a long and the risk of a short position. However, in this case, we agree with the simplifying assumption not to differentiate the regulatory AddOn factors for long and short positions.

2.3.9. General level of supervisory AddOns:

In the following table we have translated the proposed regulatory AddOns in term of volatilities.

		AddOn	Equivalent 1 year standard deviation	Reference level	1 year volatility
Interest rate		0,50%	1,9%	2%	94%
Foreign exchange		5,00%	18,8%	100%	19%
Credit Single name	AAA	0,19%	0,7%	1,0%	71%
	AA	0,19%	0,7%	1,0%	71%
	A	0,21%	0,8%	1,2%	66%
	BBB	0,27%	1,0%	1,5%	68%
	BB	0,53%	2,0%	3,0%	66%
	B	0,80%	3,0%	6,0%	50%
	CCC	3,00%	11,3%	20,0%	56%
Credit Index	IG	0,19%	0,7%	1,2%	59%
	SG	0,53%	3,0%	4%	75%
Equity Single Name		32,00%	120,0%	100%	120%
Equity Index		20,00%	75,0%	100%	75%
Commodity	Electricity	40,00%	150,0%	100%	150%
	Oil/Gas	15,00%	56,3%	100%	56%
	Metals	15,00%	56,3%	100%	56%
	Agricultural	15,00%	56,3%	100%	56%
	Other	15,00%	56,3%	100%	56%

The 1-year implied volatilities are very high even compared to the observed one during 2008 crisis.

Not surprisingly we can observe that for simple operations the NIMM EAD is generally 2 to 3 times higher than IMM general agreed levels and even worse, taking into account simplified assumptions for duration, deltas and correlations, on a representative backtesting portfolio, NIMM is in average 5 times higher than IMM model.

We would welcome some background information from the Committee on the way AddOns have been calibrated in the NIMM approach.

2.4. Conclusion:

While the Associations broadly welcome the Basel Committee's Paper as a step in the right direction and a significant improvement over CEM, we have highlighted a number of elements of the proposals that are inappropriately calibrated, overly simplistic or conservative, which may result in larger unintended consequences than appreciated and in some cases may be detrimental to lending.

While NIMM is clearly a more risk-sensitive approach than CEM, we remain concerned with the application of the currently proposed NIMM methodology, in addition to RWAs, to a number of other areas of the Basel capital framework: Leverage Ratio, Large Exposures, Central Counterparties, Margins for Non-Centrally-Cleared Derivatives, and CVA. The Industry is looking forward to support Regulators on this topic and will follow-up with further responses dealing with these concerns more specifically at the beginning of the fourth quarter 2013. We would, of course, be pleased to answer any questions Regulators may have about our submission.

3. Responses to Consultation Questions

Question 1 - Should the Basel Committee replace the CEM and SM with the NIMM in all areas of the capital framework? What are the benefits and drawbacks of using the NIMM in each of these areas?

As noted in the introduction, the Associations welcome the proposals as a step in the right direction and believe that the proposed non-internal model method (NIMM) framework has great potential. As an alternative to the current exposure method (CEM), it is clear that NIMM has the potential to perform better as a measure of exposure. However, there are certain situations where the proposed NIMM is unable to capture some collateral and netting arrangements thus resulting in disproportionately high levels of exposure. We do not believe that the multiple quantitative impact studies will be able to differentiate these issues from those of overly conservative calibration. We therefore strongly suggest that additional time be allotted by the Basel Committee to further evaluate NIMM and perform additional empirical testing on real portfolios. The Associations' members are ready and willing to engage further on this.

In addition, the industry remains concerned about the use of NIMM, or scalar multiples thereof in the wide range of applications currently considered by the Basel Committee or national supervisors (e.g. leverage ratio, standard portfolio initial margins for non-cleared derivatives, CCP hypothetical capital, large exposure framework, etc.). It will remain important to consider the pros and cons of NIMM through at least three distinct perspectives in each instance: (1) the absolute value and volatility of the metric; (2) the opportunity to arbitrage the result of the metric; and (3) the behaviour of the metric going into the next financial crisis as firms and their counterparties execute prudent risk management measures.

We attempted to illustrate these with the examples through our Industry Response. However, we would welcome acknowledgement from the Basel Committee that this is an important next step, and critically, one that needs to be articulated transparently to all regulators and across the industry.

We further illustrate below our concerns about the use of NIMM, or scalar multiples thereof in the cases of CCP hypothetical capital and the standardized CVA capital charge.

Issues with the proposed framework for cleared trades:

If used for CCPs, the 1.4 alpha factor would again work against the principle of making central clearing attractive relative to bilateral trades. Indeed not having alpha would be a way of increasing the attractiveness of central clearing. It is also not generally the case that the WW risk of the CCP towards one of its clearing members is symmetric to the WW risk that the clearing member has on the CCP. The same argument holds for clearing member exposure to clients compared to the CCP. Therefore it is more appropriate to appropriately scale it **after** the exposure at default has been calculated.

Maturity and standardized Capital for CVA:

We believe there is a problem with using the NIMM exposures in the standardized Capital for CVA formula. In that formula, the discounted (CEM) exposure is multiplied with the notional weighted legal maturity of the transaction to determine a sensitivity to the underlying credit spreads. However, the sensitivity of the CVA depends on the area of the total discounted EPE profile. Particularly when the EPE profile is upward sloping after the one year risk horizon, the latter is greater than the assumption under the current CVA formula.

In principle the maturity that should be used in the Capital for CVA formula should be the Effective Maturity (EM) and not the legal maturity. While the calculation of the EM would be part of the IMM, for forward transactions it could be approximated by multiplying the maturity with the square root of the maturity (this is based on the assumption that the EPE profile follows a square-root function and conservatively ignores discounting). For swaps this problem is less important than for forwards, as the profile is also (partially) decreasing after the risk horizon.

This was arguably already an omission in the Basel III proposal, but the complete elimination of maturity sensitivity for FX forward AddOns makes this more noticeable.

Question 2 - Is the proposed approach of retaining the general structure of the CEM with respect to replacement cost and the potential future exposure AddOn appropriate? Is the division of the broad asset classes appropriate?

We agree with the proposed approach of retaining the general structure of the CEM. However the proposed treatment of deltas and of maturity mismatches are too simple to correctly reflect the real underlying risks. We have commented and suggested enhancements to correct these issues.

Concerning the different asset classes, we are broadly in agreement with the proposed categorization. However, we do feel that additional analysis should be done around the granularity of risk factors. We comment further on this under Question 10.

Question 3 - Are there specific product types that are not adequately captured in the outlined categories?

We consider it important to differentiate product characteristics (that may apply to many situations, such as amortizing notionals), from market characteristics better approached through granularity of risk factors (such as short dated interest rate instruments), from notional definitions, and the process of determining Effective Notionals. The latter may align to "specific product types" better, but per our detailed response, we feel each of these aspects requires further elaboration, either through direct consideration, or the articulation of standards that can be transparently applied by supervisors, and consistently implemented by firms.

Question 4 - Does the above approach reflect the replacement cost of margined transactions? Are there any other collateral mechanics that the Basel Committee should consider?

The industry remains concerned with the simplistic aspects of the 3/2 multiplier as set out in our technical observations.

As explained in our technical observations, we believe that RC for margined trades (paragraph 30, TH + MTA – NICA) seems inconsistent with the definition of RC and causes inconsistency between margined and unmargined calculations. We also believe, as developed in our response, that the proposed framework does not produce appropriate results in cases where the assumption that a collateral group is identical to a netting set is not satisfied, and could have significant negative consequences on exposure calculations.

Question 5 - Of the options under consideration for recognising offset across hedging sets, which treatment is preferred? What number of maturity buckets is appropriate to consider?

We favour "approach 1" as the main risk driver of interest rates products is yield curve parallel shifts. Therefore some diversification effect must be recognised between remaining maturity buckets.

However, we would prefer a solution proposing a more granular set of maturity buckets combined with a smooth correlation structure between them, avoiding undesirable cliff effects. Bucketing is particularly critical for FX: as expressed in our main response, a one year floor for all maturities is significantly too long.

Question 6 - Is the proposed approach of using a different methodology for determining the AddOn for each asset class appropriate? Is each proposed AddOn methodology for each asset class effective at capturing the main risk driver of that asset class?

The Industry thinks the proposed risk methodology is appropriate. We however have issues with interest rates and FX asset classes, and concerns around the granularity of risk factors, see answer to question 10 below.

Question 7 - Are the proposed minimum time risk horizons for each transaction category (unmargined, non-centrally cleared, centrally cleared) appropriate? Should the Basel Committee consider factors other than the IMM for determining the appropriate time risk horizon for the NIMM (e.g. harmonising with other international or national legislation)?

We globally agree with definition of holding periods. Nevertheless we found that the treatment of deal maturities is not correct in the consultative document and we have made proposals such as building a risk profile. Please see our comments on maturities mismatches in our technical observations.

Question 8 - Do the suggested formula and 5% floor appropriately recognise the benefits of overcollateralisation?

The Industry understands that the BCBS is open to differentiated applications of NIMM. As such we believe that for exposures to CCPs the floor should be set to zero. The choice of 5% is arbitrary and requires a more targeted interpretation within various contexts. Also, knowing that supervisory factors and correlation levels are already prudent we question the addition of the 5% floor.

Please see our comments on the multiplier in our technical observations for additional details.

Question 9 - Is the proposed approach to aggregate across asset classes appropriate?

The proposed aggregation in paragraph 88 is the most conservative one. We understand that a generalization of a variance covariance approach at this last phase of computation which would need to keep for example the signed sensitivity of each asset would be too complex. But we must also recognize that levels of prices or variabilities are not perfectly correlated. We therefore think that a simple quadratic sum structure would be more realistic.

It is worth noting that a too conservative computation of AddOns would overestimate the at the money risk of the portfolio but would also largely mitigate the proposed moneyness treatment through the multiplier.

Finally, as stated in our response to question 8, knowing that supervisory factors and correlation levels are already prudent, we question the addition of the 5% floor.

Question 10 - Are there any risk factors that should be included in their own category or accounted for in another manner?

The industry does have some concerns around the granularity of risk factors and feel that further work need to be conducted to consider alternatives. In particular, where it is recognized that certain products, and product characteristics are intrinsic to the foundation for a market, then the industry feels the regulators should engage in further work to appropriately define consistent treatment. Examples from commodities would include spark spread options in power generation markets, or refining spread swaps. In the foreign exchange world, the option industry relies on the trading of risk-reversals to provide liquidity to the trading of volatility and smile. The Industry is willing to help Regulators on this topic.

Question 11 - Is the proposal to introduce the multiplier in order to allow reduction of the PFE AddOn in the IMM shortcut method appropriate?

We agree the IMM shortcut method should be consistent with NIMM but please see our comments on the multiplier in our technical observations.

4. Appendices

Summary of Appendices:

Appendix 1: Presentation of the problems With RC Calculation in NIMM

Appendix 2: Technical Appendix: Corrections and Extensions of the Definition of RC

Appendix 3: Comparative study of multipliers

Appendix 4: Example analysis showing the conservative aspect of the calibration of the AddOn

Appendix 5: Proposed Modified Duration Look-up Table

Appendix 6: Examples of ways to create regulatory hedge whereby the actual CCR exposure is left unchanged but the NIMM AddOn is nullified

Appendix 1 - Problems With RC Calculation in NIMM

The NIMM RC calculation implicitly assumes that a collateral group and a netting set are identical, i.e., if a set of trades with a counterparty is in a collateral group for which margin is calculated, then the value of those trades will net upon bankruptcy of the counterparty. When this assumption is satisfied, the definition of RC in NIMM as the value of the trades in the netting set minus the net collateral will not in general present any special difficulties. However, if the terms of the collateral agreement such as the threshold, the minimum transfer amount, and/or the initial margin threshold is non-zero, the definition of NIMM must be modified.

For collateralized exposures, the RC term in NIMM is defined as

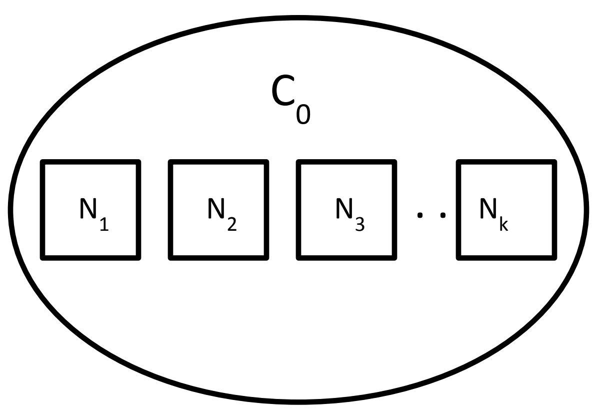
$$RC = \max(V - C, TH + MTA - NICA, 0)$$

The motivation for this definition is that even if a counterparty is margined, the exposure can get as large as the threshold plus the minimum transfer amount minus any initial margin held before margin will be collected from the counterparty. Since that exposure will also include the current exposure, RC can be as large as TH + MTA - NICA.

While this analysis is true in general, the exposure will be overestimated by this definition of RC if the threshold is set at a very high percentile of exposure. For example, it may happen that a netting set contains trades with large exposures and therefore the threshold in the collateral group was set appropriately high. Subsequently, however, if most of the trades rolled off or were changed, but the collateral threshold has not been adjusted, the threshold may be much larger than the potential exposure of the current trades in the netting set. In this case, the RC formula will overestimate the exposure substantially. Alternatively, risk managers may sometimes set a very high threshold in order to collateralize event tail risk. The RC formula will then significantly overestimate the exposure, dis-incentivizing risk managers from protecting against tail risk. To avoid this overestimation of exposure and the consequent creation of perverse incentives, we suggest capping the RC term with the uncollateralized exposure, since it is generally true that an uncollateralized exposure will serve as an upper bound on collateralized exposure measured by TH + MTA - NICA. Details can be found in technical appendix 2.

RC is not defined in NIMM for more complex relationships between netting sets and collateral groups. If the formula for RC is used without modification in these more complex situations, very serious errors in estimation may occur. A not uncommon situation is depicted in Figure 1.

Figure 1



In Figure 1, there are k netting sets that are all contained in collateral group C_0. C_0 has threshold TH and minimum transfer amount MTA. For collateral purposes, the collateral that covers the k netting sets would be calculated assuming that all trades in the collateral group net with each other, even if they do not net at the netting set level. Thus, collateral is calculated on the mark-to-market (MTM) value of the trades in all netting sets while exposure is calculated by netting set, since netting sets reflect a legal opinion on whether trades will be allowed to net in bankruptcy court. Netting sets may differ from collateral groups.

To illustrate how RC may mis-estimate exposure in some simple cases, we repeat examples 1, 2, and 5 from the BCBS Consultative Document but change the netting details.

Suppose Netting set 1 consists of the three interest derivatives from Example 1 of the consultative document:

Trade #	**Nature**	**Residual maturity**	**Base currency**	**Notional (thousand)**	**Pay Leg (*)**	**Receive Leg (*)**	**Market value (thousand)**
1	Interest rate swap	10 years	USD	10,000	Fixed	Floating	30
2	Interest rate swap	6 years	USD	10,000	Floating	Fixed	-20
3	European swaption	1x10 years	EUR	5,000	Floating	Fixed	50

Netting sets 2, 3, and 4, are the three credit derivative trades from Example 2 of the consultative document, respectively:

Trade #	**Nature**	**Reference entity/ Index name**	**Rating**	**Residual maturity**	**Base currency**	**Notional (thousand)**	**Position**	**Market value (thousand)**
1	Single name CDS	Firm A	AA	3 years	USD	10,000	Protection buyer	2
2	Single name CDS	Firm B	BBB	6 years	EUR	10,000	Protection seller	-4
3	CDS Index	IG	IG	5 years	USD	10,000	Protection buyer	0

Thus, we assume that credit derivative trades do not net with each other or the interest rate trades and have modified the example so that there are four netting sets belonging to one collateral group. Assuming trade details identical to Example 1 for supervisory deltas, adjusted notional amounts and effective notional amounts and aggregation, we may calculate the interest rate AddOn:

$$\text{Netting Set 1: } AddOn^{IR} = 325$$

in agreement with the results in the Consultative Document. With trade details identical to Example 2 we can calculate the AddOns for each credit derivative netting sets:

$$\text{Netting Set 2: } AddOn^{CR1} = 57$$

$$\text{Netting Set 3: } AddOn^{CR2} = -162$$

Netting Set 4: $AddOn^{CR3} = 95$

Example A-1: Held Collateral over multiple netting sets

We assume the margin agreement is exactly as Example 5 of the consultative document:

Margin Frequency	Threshold	Minimum Transfer Amount	Independent Amount	Collateral currently held
weekly	0	5	150	200

Then, if we apply the terms of this margin agreement to each netting set, and use the AddOns referenced above, we have:

Netting set	Asset Class	(TH + MTA - NICA)	(V - C)	RC	AddOn	MPOR	$AddOn_{Margin}$	Multiplier	EAD
1	IR	-145	-140	0	325	14	115	0.552	89
2	Credit	-145	-198	0	57	14	20	0.056	2
3	Credit	-145	-204	0	162	14	58	0.197	16
4	Credit	-145	-200	0	95	14	34	0.092	4
									111

In contrast, the table below presents the calculation for Example 5 of the consultative document, assuming that all trades net:

Netting set	Asset Class	(TH + MTA - NICA)	(V - C)	RC	AddOn	MPOR	$AddOn_{Margin}$	Multiplier	EAD
5	IR				325				
5	Credit				161				
		-145	-142	0	486	14	173	0.666	**161**

In this example, we see that the repeated application of held collateral to each netting set leads to zero values for replacement costs as well as low multipliers, and thus to an aggregate EAD of 111 which is much lower than the 162 EAD of Example 5, where full netting of the credit derivatives was allowed. Exposure is underestimated by 31%

Example A-2: Placed Collateral over multiple netting sets

Now consider the same margin agreement, but where the collateral is posted instead of held.

Margin Frequency	Threshold	Minimum Transfer Amount	Independent Amount	Collateral currently placed
weekly	0	5	150	-200

If all trades net, the replacement cost and multiplier change with the placed collateral, so we have:

Netting set	Asset Class	(TH + MTA - NICA)	(V - C)	RC	AddOn	MPOR	$AddOn_{Margin}$	Multiplier	EAD
5	IR				325				
5	Credit				161				
		-145	258	258	486	14	173	1.000	**603**

However, if the credit derivative trades do not net, we obtain:

Netting set	Asset Class	(TH + MTA - NICA)	(V - C)	RC	AddOn	MPOR	$AddOn_{Margin}$	Multiplier	EAD
1	IR	-145	260	260	325	14	115	1.000	526
2	Credit	-145	202	202	57	14	20	1.000	311
3	Credit	-145	196	196	162	14	58	1.000	355
4	Credit	-145	200	200	95	14	34	1.000	327
									1519

In example A-2, we see that the repeated application of posted collateral to each netting set leads to high replacement costs as well as multipliers with value 1, and thus to an aggregate EAD of 1519 which is 51% higher than the 603 EAD obtained when all trades net.

In practice, under- and over-estimation of the risk can be much greater than suggested by these simple examples. Consider the case in which there are 100 trades in a collateral group, but none of the trades net, which may occur if the trades are in a legal jurisdiction in which netting is disallowed. Assume further that TH = MTA = NICA = 0. Assume that a collateral calculation on the trades in the collateral group yields C = $10 million. Assume that V_i is the MTM value of the ith trade.

Because none of the trades net, each trade is a separate netting set from the point of view of the NIMM RC formula. A straightforward application of the NIMM RC formula for the ith netting set is

$$RC_i = \max(V_i - 10,0)$$

and total RC for all netting sets in the collateral group is

$$RC_{total} = \sum_{i=1}^{100} RC_i = \sum_{i=1}^{100} \max(V_i - 10,0)$$

In this case, \$10 million in collateral in subtracted from the value of each trade, resulting in substantially more collateral being subtracted from exposure than exists. Moreover, since the collateral for the entire collateral group is subtracted from each trade, the reduced value of RC will lower the multiplier on the PFE. The effect on RC is bounded, though, by the requirement to floor RC at zero.

Continuing the same example, if we assume that the collateral agreement requires posting \$10 million to a counterparty, then total EAD attributed to RC for the 100 netting sets would be

$$RC_{total} = \sum_{i=1}^{100} RC_i = \sum_{i=1}^{100} \max(V_i + 10,0)$$

Thus, we are adding 100 X \$10 million X 1.4 = \$1.4 billion in excess EAD to the NIMM exposure of the counterparty. Examples of real counterparties have been observed in which IMM exposures are small, on the order of tens of millions, but RCs have been estimated using NIMM to be in the multi-billion dollar range, about a 100-fold increase.

Even if collateral is zero, exposure can still be dramatically overestimated when collateral agreements have non-zero thresholds. For example, suppose we modify the example so that C = MTA = NICA = 0 for the 100 trades in the collateral group, but there is a threshold of \$10 million dollars. Since the formula for the RC term in NIMM is the max of the collateralized exposure and the threshold by collateral group, total EAD resulting from the term RC will still result in excess EAD of 100 X \$10 million X 1.4 = \$1.4 billion. If the collateral group has a non-zero MTA and NICA, they will be over-counted as well of course. Dramatic overestimation of exposures of real counterparties in NIMM produced by this over-counting of TH + MTA - NICA in the RC formula have been observed, with real counterparty examples of IMM exposures in the tens of millions and NIMM exposures in the billions.

To correct this problem, we suggest a simple modification of the definition of RC to cover the case in which more than one netting set belongs to a collateral group. Rather than calculate exposure net of collateral for each netting set in a collateral group, we first calculate exposure for each netting in collateral group, sum them up, and then subtract net collateral. That definition counts collateral only once and is consistent with IMM definitions of exposure.

In implementing this generalized definition of RC, it is important to distinguish between the case when net collateral is received and when it is posted. When net collateral is received, we sum up the value of each netting set floored at zero, so that we measure positive exposure for each netting set. We then subtract collateral received from the sum of the positive exposures of each of the netting sets.

However, when net collateral is posted, we cannot use this definition for exposure in RC. When collateral is posted, the exposure is the difference between the value of the collateral posted and the sum of the amounts the bank owes the counterparty on each netting set. To measure how much the bank owes on each netting set, we must use the negative value of the trades in the netting set, capped at zero. Thus, when net collateral is positive, so that collateral is received, we measure exposure in the standard way as the net value of the trades in portfolio, floored at zero. But when net collateral is negative, so that collateral is posted, we measure net exposure as the value of the trades in the netting set, capped at zero. A corrected definition of RC must include both cases in order to correctly estimate replacement cost.

We illustrate the logic with a simple example. Suppose there are 5 netting sets in the collateral group and that the collateral agreement is bilateral with TH = MTA = NICA =0. The trades in the netting sets have the following values:

$$N_1 = 1$$

$$N_2 = 1$$

$$N_3 = 1$$

$$N_4 = -1$$

$$N_5 = -1$$

The collateral attributed to these trades would be 1 + 1 +1 -1 -1 = 1, so that the bank receives from the counterparty collateral equal to 1. Exposure upon counterparty default would equal the amount the bank is owed, which is 3, minus the collateral received, which is 1, yielding a net exposure of 2. In this case, it is not necessary to use N_4 and N_5 in the calculation.

However, if we modify the example so that the bank posts collateral, we need to use the negative values to correctly calculate the exposure. Suppose instead that:

$$N_1 = 1$$

$$N_2 = -1$$

$$N_3 = -1$$

$$N_4 = -1$$

$$N_5 = -1$$

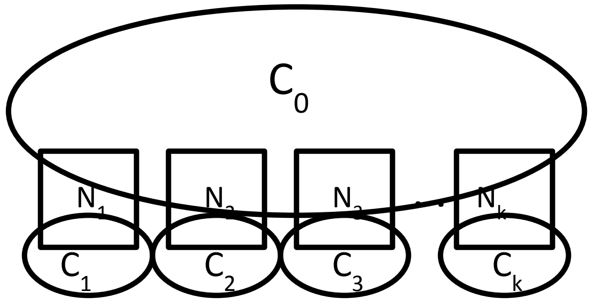
In this case, the collateral calculation would yield 1 -1 -1 -1-1 = - 3, so that the bank would post 3 in collateral to the counterparty. If the counterparty defaults, the bank is owed 1 on netting set N_1. The bank also owes the counterparty 4 but has posted 3, so that net collateral posted is 0. Since there is no contribution to exposure resulting from excess posted collateral, exposure is 1 in this case.

If we had not taken into account the negative values, we would have obtained an incorrect answer, since we would have calculated the exposure to be 1 from netting set N_1 plus 3 from the collateral posted, which would equal 4 in total. Thus, a corrected RC definition must account for negative values whenever collateral is posted. Equation 1 in the technical appendix to this letter is a precise statement of a corrected RC definition.

While distinguishing between received and posted collateral, a corrected definition of RC will also need to include the TH + MTA - NICA term to account for potential uncollateralized exposure. We suggest that RC in this case also be capped using the uncollateralized exposure calculation in order correct for the case when TH + MTA - NICA is too large relative to the exposure in the netting sets. Equations 2 and 3 in the technical appendix include these features.

The relationship between collateral groups and netting sets can be more complicated than depicted in Figure 1, since it is possible that trades in a particular netting set can be covered by more than one collateral group. Figure 2 portrays a situation in which some trades in each netting sets are members of a common collateral group, but each netting set also contains trades that are covered by separate collateral agreements and trades that are uncollateralized.

Figure 2



This situation can arise in practice since counterparties may agree to collateralize some trades with one set of terms and a different set of trades with alternative collateral terms or no terms at all. This agreement, however, is independent of the legal ability of the trades to net upon bankruptcy and so may result in netting sets that are covered by more than one collateral group.

In this more general case, application of RC in NIMM is also undefined, and unlike the situation depicted in Figure 1, there are ambiguities in applying the standard definition of RC. For each netting set, should we apply the threshold associated with the collateral group C_0 or the threshold associated with C_i in RC? If we add or subtract collateral from both collateral groups for each netting set in RC, how do we account for the fact that some trades are uncollateralized?

To define NIMM in this case, we suggest breaking each netting set into three subsets for which we can apply definitions of RC that already cover each subset. The first subset of the netting set would consist of trades that are common to the netting set and the collateral group that is specific to that netting set. Since that netting set satisfies the condition that a collateral group is identical to a netting set, we can use the standard definition of RC, capped by the uncollateralized exposure. The second subset would consist of trades that are covered by the common collateral group. RC in this case would be defined as already suggested to cover the case depicted in Figure 1. The third subset, which consists of uncollateralized trades, would be handled using the standard NIMM calculation for uncollateralized exposures. Equation 4 in the technical appendix is a precise statement of how to calculate RC for the subsets of each netting set.

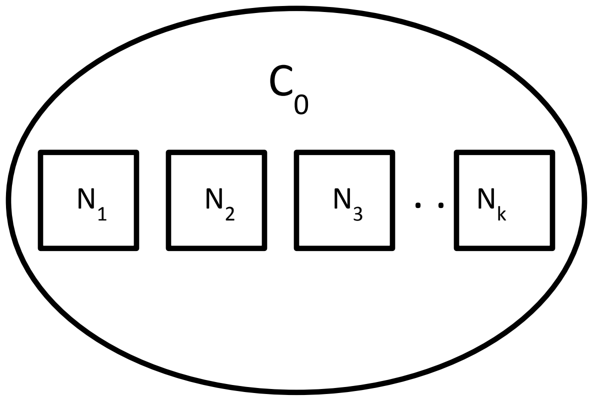
Since the PFE multiplier depends on the initial value of the trades in the netting set, it will also need to be defined for the situations depicted in Figure 1 and 2. Since the PFE multiplier is designed to reflect the effect of negative mark-to-market value of trades in a netting set and overcollateralization, we suggest that the multiplier be defined for situation shown in Figure 1 with respect to the mark-to-market value of the all the trades net of collateral that are in the common collateral group rather than netting set by netting set. This definition will be consistent with the definition of RC already suggested for this case. With this definition, the multiplier for the case covered by Figure 2 will also be defined, since the correction for RC in Figure 2 consists of using the standard definition of RC and the definition of RC suggested for Figure 1. Equations 5, 6, and 7 in the technical appendix make precise our suggestion for how to compute the collateralized mark--to-market value of the trades in each netting set.

We strongly urge that the definition of RC be extended along the lines we suggest in appendix 2. Although the RC formula can be unambiguously used in the case when there is more than one netting set in a collateral group, very significant errors in estimation can occur. For more complex relationships between netting sets and collateral groups, it is not clear how to use the RC formula. Quantitatively, the aggregate effect of failing to adjust for multiple netting sets in one collateral group depends on their prevalence in a bank's portfolio. While the effect is likely to vary across banks, one bank estimated that its aggregate NIMM exposure would increase very significantly as a result of failing to extend the RC in NIMM to the case of multiple netting sets in a collateral group.

Appendix 2 - Technical Appendix: Corrections and Extensions of the Definition of RC

This technical appendix defines precisely the corrections and extensions to the RC term that we have suggested in the text of the letter and Appendix 1. Consider the situation depicted in Figure 1.

Figure 1



In Figure 1, there are k netting sets that are all contained in collateral group C_0. C_0 has threshold TH and minimum transfer amount MTA.

Assume that TH = MTA = NICA = 0. Define

$$V_i = value\ of\ trades\ in\ ith\ netting\ set$$

$$\hat{V}_i = \max(V_i, 0)$$

$$\bar{V}_i = \min(V_i, 0)$$

$$C^+ = C, C^- = 0\ if\ C \geq 0$$

$$C^+ = 0, C^- = C\ if\ C < 0$$

Thus, C^+ is net collateral received and C^- is net collateral posted.

Then, consistent with the discussion in the text of the letter and appendix 1, we have

Equation 1

$$RC_{total} = max\left(\left[\sum_{i=1}^{k} \hat{V}_i\right] - C^+, 0\right) + max\left(\left[\sum_{i=1}^{k} \bar{V}_i\right] - C^-, 0\right)$$

The first term in equation 1 accounts for net collateralized exposure of the counterparty. The second term in equation 1 accounts for excess collateral the bank posts. Note that Equation 1 now measures the total RC for all netting sets within a collateral group.

We can correct the over-counting of TH + MTA - NICA by generalizing equation 1 as follows:

Equation 2

$$RC_{total} = max\left(\left[\sum_{i=1}^{k}\hat{V}_i\right] - C^+, TH + MTA - NICA, 0\right) + max\left(\left[\sum_{i=1}^{k}\bar{V}_i\right] - C^-, 0\right)$$

where the sum is taken over the k netting sets in a collateral group.

To adjust for the case when TH + MTA - NICA is too large, we suggest capping the first term in equation 2 with the uncollateralized exposure. We have then

Equation 3

$$RC_{total} = min\left[max\left(\left[\sum_{i=1}^{k}\hat{V}_i\right] - C^+, TH + MTA - NICA, 0\right), UCE\right] + max\left(\left[\sum_{i=1}^{k}\bar{V}_i\right] - C^-, 0\right)$$

where UCE = uncollateralized exposure. Equation 3 is the general correction to the definition of RC to account for collateral groups that contain more than one netting set.

If the value of the trades is sufficiently negative, we note that equation 3 can overestimate the risk. The NIMM RC formula is designed to take the max of collateralized exposure and TH+MTA-NICA, since exposure to the bank will generally equal max(TH+MTA-NICA + 2-week gap risk,0) if the counterparty is posting collateral to the bank. If MTM is sufficiently negative, however, it may no longer be the case that the collateralized exposure is max(TH+MTA-NICA + 2-week gap risk,0). If the mark-to-market exposure is sufficiently negative, and the bank has posted collateral, then exposure may occur because the value of the trades becomes even more negative as time passes and then becomes less negative during the 2-week gap risk period. We illustrate using a simple example.

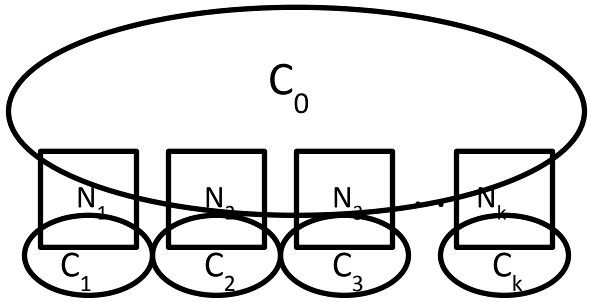
Suppose current MTM = -10 and TH is 50. MTA = NICA = 0. Suppose further that at time T, just before the 2-week gap period, MTM = -100, so that the bank posts 50 to the counterparty. Now assume that over the 2-week gap period, MTM becomes -80. In this case, the bank owes 80 to the counterparty and has posted 50 and so owes 30 to the counterparty. Thus, the bank's exposure is zero. Another way to see this is that gap risk is -80 - (-100) = 20. Since the TH is 50, the amount the bank owes is 20 - 50 = -30, so exposure is zero. Thus, when a bilateral collateral agreement holds and initial MTM of the trades is sufficiently negative, we have

$$exposure = \max(2weekgaprisk - TH, 0)$$

However, even when MTM is very negative, the first term is equation 2 will equal TH + MTA - NICA, overestimating the risk. We do not suggest resolution of this problem in order to keep the RC correction as simple as possible.

Equation 3 is designed to handle the case in which one collateral group encompasses more than one netting set. However, the relationship between collateral groups and netting sets can be more complicated than depicted in Figure 1, since it is possible that trades in a particular netting set can be covered by more than one collateral group. Figure 2 portrays a situation in which some trades in each netting sets are members of a common collateral group, but each netting set also contains trades that are covered by separate collateral agreements and trades that are uncollateralized.

Figure 2



We can generalize the logic in equations 1,2, and 3 to treat this more general case. For each netting set i, N_i, we define:

$$N_i^0 = trades\ in\ netting\ set\ i\ associated\ with\ collateral\ group\ 0$$

$$N_i^i = trades\ in\ netting\ set\ i\ associated\ with\ collateral\ group\ i$$

$$N_i^U = trades\ in\ netting\ set\ i\ that\ are\ uncollateralized$$

such that

$$N_i = N_i^0 + N_i^i + N_i^U$$

We thus break apart each netting set into sub-netting sets that are defined by collateral group. Then, for the collateralized trades in the k netting sets we can sum over collateral groups as before to calculate total RC:

Equation 4

$$RC_{total} = min\left[max\left(\left[\sum_{i=1}^{k} \hat{V}_i^0\right] - C^{0,+}, TH^0 + MTA^0 - NICA^0, 0\right), UCE\right] + max\left(\left[\sum_{i=1}^{k} \bar{V}_i^0\right] - C^{0,-}, 0\right)$$
$$+ \left[\sum_{i=1}^{k} \min[\max(\hat{V}_i^i - C^{i,+}, TH^i + MTA^i - NICA^i, 0), UCE_i]\right]$$
$$+ \sum_{i=1}^{k} \max(\bar{V}_i^i - C^{i,-}, 0)$$

where

$$V_i^0 = MTM\ of\ trades\ in\ collateral\ group\ 0\ and\ netting\ set\ i$$

$$V_i^i = MTM\ of\ trades\ in\ collateral\ group\ i\ and\ netting\ set\ i$$

$$\hat{V}_i^0 = \max(V_i^0, 0)$$

$$\hat{V}_i^i = \max(V_i^i, 0)$$

$$\bar{V}_i^0 = \min(V_i^0, 0)$$

$$\bar{V}_i^i = \min(V_i^i, 0)$$

$$C^0 = collateral\ attributed\ to\ trades\ in\ collateral\ group\ 0$$

$$C^i = collateral\ attributed\ to\ trades\ in\ collateral\ group\ i$$

$$C^{0,+} = C^0, C^{0,-} = 0\ if\ C^0 \geq 0$$

$$C^{0,+} = 0, C^{0,-} = C^0\ if\ C^0 < 0$$

$$C^{i,+} = C^i, C^{i,-} = 0\ if\ C^i \geq 0$$

$$C^{i,+} = 0, C^{i,-} = C^i\ if\ C^i < 0$$

$$UCE = uncollatearalized\ exposure$$

$$UCE_i = uncollateralized\ exposure\ of\ ith\ netting\ set$$

We note that exposure of the trades in the sub-netting sets N^u_i would be computing using the NIMM uncollateralized method.

The calculation of collateralized MTM affects the PFE multiplier, but the suggested changes in equations 3 and 4 do not show how to calculate the component of the multiplier related to collateralized MTM. Since we do not know the details of how the NIMM parameters were calibrated, it is difficult to suggest an alternative calibration. We do understand that the multiplier is designed to include negative mark-to-market and overcollateralization, and so one simple adjustment that could be used is to compute adjusted collateralized MTM versions of equations 3 and 4 in order to define the PFE multiplier. For example, to obtain the PFE multiplier for the situation covered by equation 3, we could calculate

Equation 5

$$Collateralized\ MTM = \left[\sum_{i=1}^{k} V_i\right] - C$$

where V_i = the MTM value of the trades in netting group i. The PFE multiplier that would be used for RC_{total} would be based on Collateralized MTM. Thus, the multiplier would reflect the degree of negative MTM and overcollateralization of all the trades in the collateral group.

For the situation covered by equation 4, the analogous calculation for trades covered by netting set 0 is

Equation 6

$$Collateralized\ MTM^0 = \left[\sum_{i=1}^{k} V_i^0\right] - C^0$$

where the common PFE multiplier for all of the netting sets in collateral group 0 is based on the Collateralized MTM in the 0^{th} collateral group. We can also calculate a specific PFE multiplier for each of the groups of trades in each netting set covered by collateral group i by basing each multiplier on the Collateralized MTM calculation in equation 7.

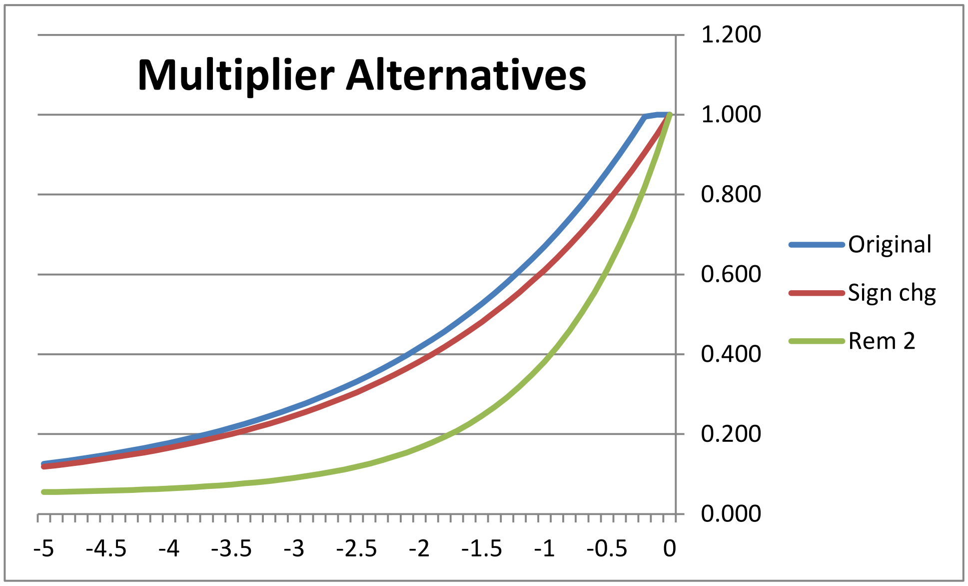
Equation 7

$$Collateralized\ MTM^i = V_i^i - C_i^i$$

Appendix 3:

Comparative study of multipliers:

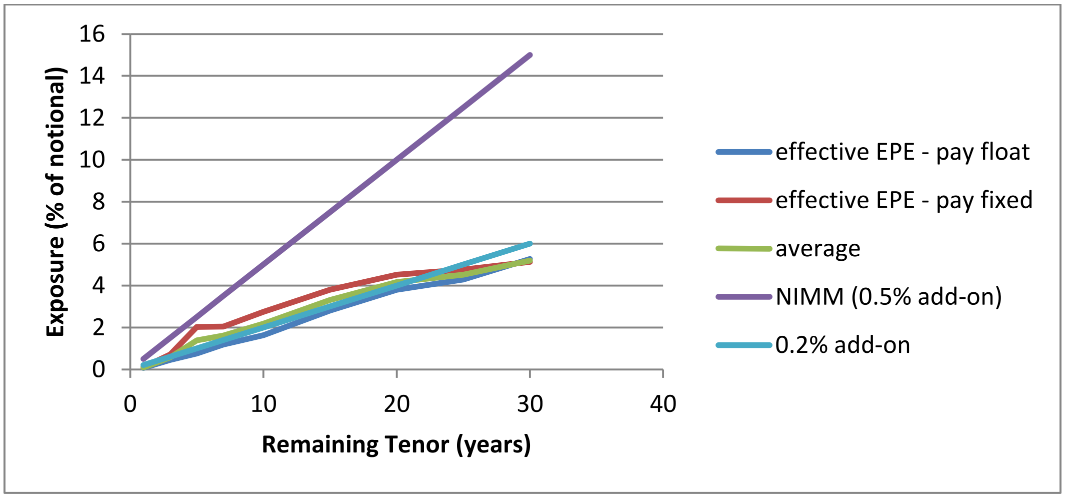
- **Original** – formula proposed in the Paper
- **Sign Chg -** formula proposed in the Paper, replacing (1+Floor) with (1-Floor)
- **Rem 2 -** formula proposed in the Paper, replacing (1+Floor) with (1-Floor) and removing the "2" in the denominator



Appendix 4:

As an example, a quick analysis showed that the calibration of the AddOn seems quite conservative. An analysis based on current AUD IR derivatives showed that an AddOn of 0.2% per year would be more in line with more sophisticated models, as well as being more in line with the current AddOn percentages – while still removing the "cliff effect" that currently exists in the CEM. For longer dated swaps the results would vary.

Assumptions: AUD Interest rate curve level (on zero coupon basis) were within the range of 2.6% (short term, 1Y) and 4.4 % (long term 20Y)



Appendix 5:

Modified Duration Look-up Table - The values in the table below are solely based on plain vanilla bond price sensitivities formulas. (redemption value is 100% of face value, the basis is US 30/360)

Swaps Modified Duration									
Swap Rate\Swap Tenor	**1 Year**	**2 Year**	**5 Year**	**7 Year**	**10 Year**	**20 Year**	**30 Year**	**40 Year**	**50 Year**
1%	1	2	5	7	9	18	26	33	39
2%	1	2	5	6	9	16	22	27	32
3%	1	2	5	6	9	15	20	23	26
4%	1	2	4	6	8	14	17	20	22
5%	1	2	4	6	8	13	15	17	18
6%	1	2	4	6	7	12	14	15	16
7%	1	2	4	5	7	11	12	13	14
8%	1	2	4	5	7	10	11	12	12
9%	1	2	4	5	7	9	10	11	11
10%	1	2	4	5	6	9	9	10	10
11%	1	2	4	5	6	8	9	9	9

Appendix 6:

Examples of ways to create regulatory hedge whereby the actual CCR exposure is left unchanged but the NIMM AddOn is nullified:

Example 1:

One way to set the AddOn to zero on any given hedging set is to put on a short term derivative of identical adjusted notional and opposite direction. As NIMM allows full netting of adjusted notional, the result will be a zero adjusted notional and a zero AddOn. This in spite of the fact that the actual counterparty exposure is only marginally changed and the small market risk induced by this position can be hedged with a another counterparty.

Example 2:

If we consider interest rates products, nullifying the AddOn can also be achieved with that counterparty only hardly changing the counterparty credit risk profile and leaving market risk unchanged.

If the hedging set has an adjusted notional of N
add to the portfolio 3 transactions.

(1) a +N notional derivative maturing in 2T
(2) a -N notional derivative maturing in T
(3) a -N notional derivative forward starting at T and maturing at 2T

Where T is a short term maturity.