WHITE PAPER

RISK MANAGEMENT

COUNTERPARTY CREDIT RISK BEYOND BASEL - IMPROVING SA-CCR FOR INTERNAL RISK MANAGEMENT

RISK MANAGEMENT

COUNTERPARTY CREDIT RISK BEYOND BASEL - IMPROVING SA-CCR FOR INTERNAL RISK MANAGEMENT

INTRODUCTION – IMPROVING SA-CCR FOR INTERNAL RISK MANAGEMENT

The Basel Committee's new standardised approach for measuring counterparty credit risk exposures (SA-CCR), effective from January 2017, places banks at an interesting crossroads regarding a possible upgrade to their internal risk measurement and control policies. Many banks that don't yet apply advanced internal models may benefit from moving towards an internal risk management approach inspired by the SA-CCR, e.g., for managing credit limits, in addition to adopting the SA-CCR for regulatory capital adequacy. However, there are some important caveats and flexibilities that need to be taken into account, as we explain below.

The situation today

Until now banks have had to make a choice between two main methods of calculating counterparty exposures for the purpose of making internal decisions about credit risk management:

- Traditional mark-to-market plus add-on approach (MtM + Add-on).
- Simulation of potential future exposure (PFE) using a Monte Carlo engine.

Some banks adopt a hybrid policy such as using PFE simulation only for certain products or only as an end-of-day calculation, with non-simulated or intra-day exposures (e.g., for pre-deal limit checks) calculated as MtM + Add-on.

Whilst a simulation-based approach is deemed to be best practice, smaller financial institutions with low volumes of derivatives often cannot justify investing in a Monte Carlo engine integrated with their limits framework.

The MtM + Add-on approach is similar to the "Current Exposure Method" (CEM) for calculating regulatory capital, although banks using a non-simulation based approach for internal risk measurement generally fall into one of two camps:

- Those that base their policy exactly on the Basel I & II CEM.
- Those that have developed an internal MtM + Add-On policy, which may or may not be inspired by the CEM. Such policies may include more refined add-on percentages, time-banded exposure profiles, add-on offsetting based on risk factor sensitivities, etc.

This is why some banks are now at a crossroads. With the new SA-CCR regulations making the CEM capital calculation obsolete from January 2017, should banks continue to base their internal risk measurement on the CEM and MtM + Add-on approaches, or replace these with an approach more in line with the new SA-CCR?

The new SA-CCR

The Basel Committee's new standardised approach for measuring counterparty credit risk exposures will fundamentally revise the calculation of counterparty exposure-at-default (EAD) for the purposes of regulatory capital adequacy.

The regulatory EAD is critical because it represents the "loan-equivalent" amount, which in turn is multiplied by a risk weight (generally reflecting the creditworthiness of the counterparty) to give the amount subject to the relevant minimum capital ratios (e.g., eight percent).

The new SA-CCR is widely recognised as being more risk sensitive than the Current Exposure Method. Table 1 sets out the key differences between the CEM and SA-CCR methodologies, with the main changes being:

- An improved recognition of offsets between transactions within "hedging sets", i.e., groups of transactions that share the same (or correlated) underlying risk factors. This represents a significant improvement compared to the much-criticised "net-to-gross ratio" (NGR) methodology used in the CEM.
- A more accurate treatment of collateralisation and margining, effectively recognising:
  - The shorter time horizon of margined exposures, based on the Basel III "margin period of risk" rules.
  - The effect of "thresholds" and "independent collateral amounts" (including initial margins) on potential future exposure.
- A closer alignment with the Internal Model Method (IMM). For example, the SA-CCR weighting factors are calibrated to a period of stress, the formula incorporates an "Alpha" multiplier of 1.4, and it assumes a risk horizon of one year for all exposures.

Many banks that don't yet apply advanced internal models may benefit from moving towards an internal risk management approach inspired by the SA-CCR.

Table 1: Key differences between the CEM and SA-CCR methodologies

	CEM	SA-CCR
Basic Formula	EAD = Max (0, Replacement Cost + Add-on – Collateral)	EAD = Alpha x (Replacement Cost + Add-on) Alpha = 1.4
Replacement Cost	Max (MtM, 0)	Unmargined: Max (MtM - Collateral, 0) Margined: Max (0, MtM - Collateral, Threshold + MTA - Net Independent Collateral Amount)
Add-on Time Dimensions	<1Y, 1-5Y, 5Y+	1Y Scaled by sqrt(t) for transactions less than 1Y Scaled by "supervisory duration" for IR & Credit Derivatives
Margined Add-on	No scaling	Scaled by sqrt of Margin Period of Risk x 1.5 (i.e., 0.3 for a typical 10-day MPOR)
Margined Add-ons	Up to 60% based on "net-to-gross" ratio	Up to 100% within "hedging sets" (long vs short in same underlying asset) Partial offsetting (based on "supervisory correlation") across equities, credit & commodity types No offsetting across hedging sets
Add-ons Calibration	Based on pre-crisis volatilities	Based on period of stress
Offsetting of Negative Replacement Cost against Add-ons	None	"Multiplier" formula allowing reduction floored to 5%
Delta-weighting of Add-ons	None	Simple Black formula using conservative "supervisory volatilities"

Table 2: Comparison of CEM versus SA-CCR exposure for sample transactions

Transactions	CEM (% of notional)	SA-CCR (% of notional)	Details of SA-CCR calculation	SA-CCR/CEM
5-year Interest Rate Swap – Unmargined	0.5%	3.1%	0.5% Add-On x 1 Maturity Factor (MF) x 4.4 Supervisory Duration (SD) x 1.4 Alpha	**620%**
5-year Interest Rate Swap – Margined	0.5%	0.93%	0.5% Add-On x 0.3 MF x 4.4 SD x 1.4 Alpha	**186%**
3-month FX Forward – Unmargined	1%	2.8%	4% Add-on x 0.5 MF x 1.4 Alpha	**280%**
Two completely offsetting 5Y IR Swaps	0.2% (0.5% x 40% due to zero NGR)	0%	Transactions are long/short in same hedging set hence completely net Add-ons	**0%**
Two 6M FX Forwards (USD/EUR + GBP/USD) with opposite MtMs	0.4% (1% x 40% due to zero NGR)	3.96%	4% Add-on x 0.71 MF x 1.4 Alpha Transactions are in different hedging sets (based on currency pairs) and hence add-ons don't offset	**990%**

The methodological differences between the CEM and SA-CCR regulatory approaches have a significant effect on the exposure amounts calculated for some common transaction types (Table 2). For example, the regulatory exposure calculated for an unmargined 5-year interest rate swap will be six times higher under the new SA-CCR approach.

The regulators intend to replace the CEM with the SA-CCR on 1 Jan 2017. Banks will have to implement the new measure because it plays a central role in the Basel capital adequacy framework. Even banks that are IMM-approved will need to implement the SA-CCR for certain purposes, e.g., for reporting "large exposures" and for calculating the regulatory leverage ratio.

Capital is ever more important to bank management. Keeping internal approaches to risk measurement and risk control in line with regulatory capital can only be considered a positive move.

Internalising SA-CCR

Banks that currently use the CEM for both capital adequacy and internal risk management purposes need to consider upgrading their internal risk measurement approach to keep in step with the latest regulatory mandate.

Capital is ever more important to bank management. Keeping internal approaches to risk measurement and risk control in line with regulatory capital can only be considered a positive move. Furthermore, having to support different logics for the various methodologies will introduce additional support and maintenance overheads for the bank, and mean that more time will be spent explaining and reconciling numbers.

Banks that use a different MtM + Add-on method should, in our view, also consider upgrading to an SA-CCR type of methodology, because the SA-CCR approach may be more risk sensitive and a consolidation of methodologies offers operational benefits.

It should be noted that the new SA-CCR calculation requires significant system enhancements. The "hedging set" concept will require access to additional trade data in order to identify the underlying risk factor that determines the right set for each transaction, the direction of the trade relative to that risk factor, the delta of options, and so on.

This additional complexity may lead banks to delegate the responsibility for the regulatory EAD calculation from the finance department to the risk department. In particular, banks may wish to leverage their investment in an SA-CCR calculation engine by applying it to their internal measurement of exposures against limits. This would have the advantage of addressing the reconciliation challenge between the finance and regulatory numbers, on the one hand, and internal exposure numbers on the other.

Adjusting SA-CCR for internal risk management

Banks embarking on the implementation of the SA-CCR will soon realise that there are some aspects of the measure that make it ill-suited for internal risk management and limit utilisation.

Whilst it is likely that many banks will embrace the general methodology, as it is more risk sensitive, they will need to make some adjustments to reflect their internal needs and their credit risk policies. Here are some aspects of the SA-CCR that may require revision as the approach is adapted to support internal risk management.

Time banding
Conceptually, the regulatory "PFE Add-on" percentages represent the one-year expected exposure point (weighted by the square root of time for transactions of less than one year). The EAD is a single number, with no time profile attached to it. Some banks may therefore wish to refine this treatment to allow for:

- A scaling of (single number) exposures to reflect a transaction's residual maturity.[1] This could be achieved by applying a square root of time multiplication to both short-term and long-term exposures.
- Multi-date exposure profiles reflecting the true dynamics of potential future exposures over time. For example, "root-t" profiles for forward transactions and "humped" profiles for swap transactions (Figure 1a-b); and of course portfolio profiles that reflect exposures rolling off as transactions mature.

Converting from an expected to potential loss measure
There are two key issues here:

- Weighting factors, i.e., add-on percentages, may need reviewing to represent potential future exposure at a given confidence interval, rather than expected exposure.
- Banks may wish to ignore the 1.4 Alpha multiplier and instead calibrate PFE weighting factors to a 97.5 percent or 99 percent confidence level. We see no point in multiplying the MtM component of the exposure by 1.4 (as is the case in the SA-CCR formula) if the PFE component is sufficiently conservative.

Figure 1a: Root-t exposure profile, e.g., forward transaction

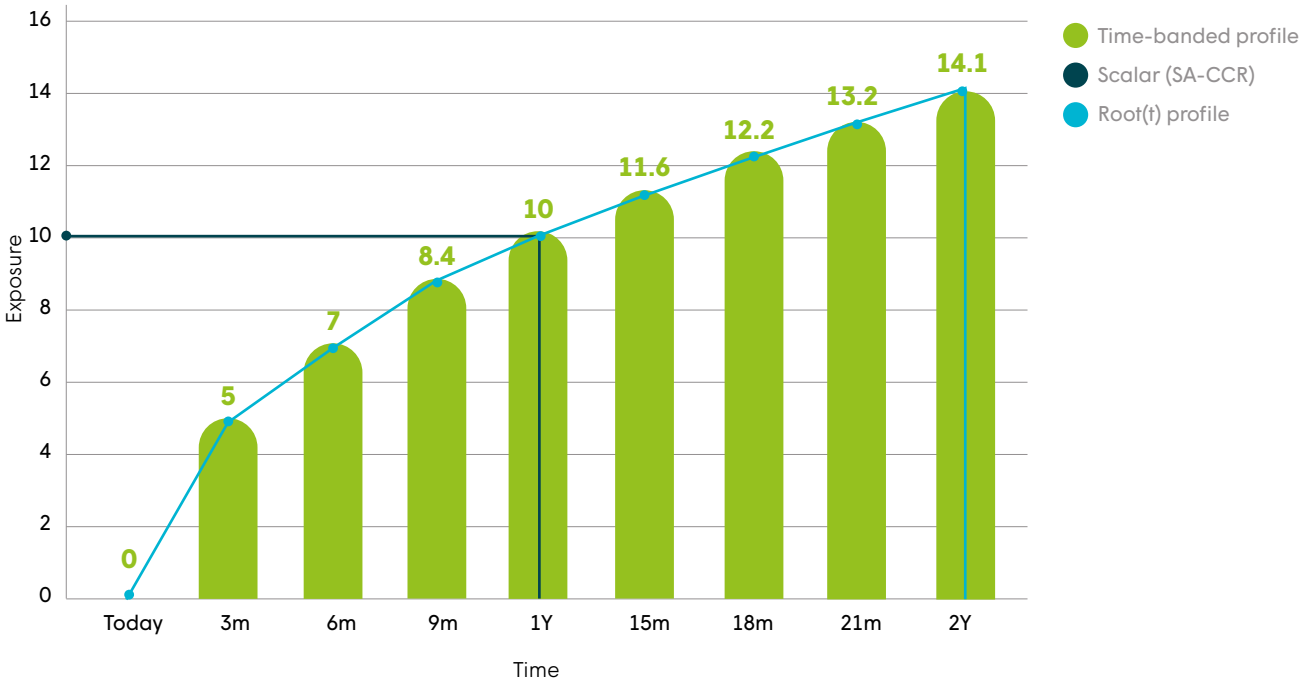
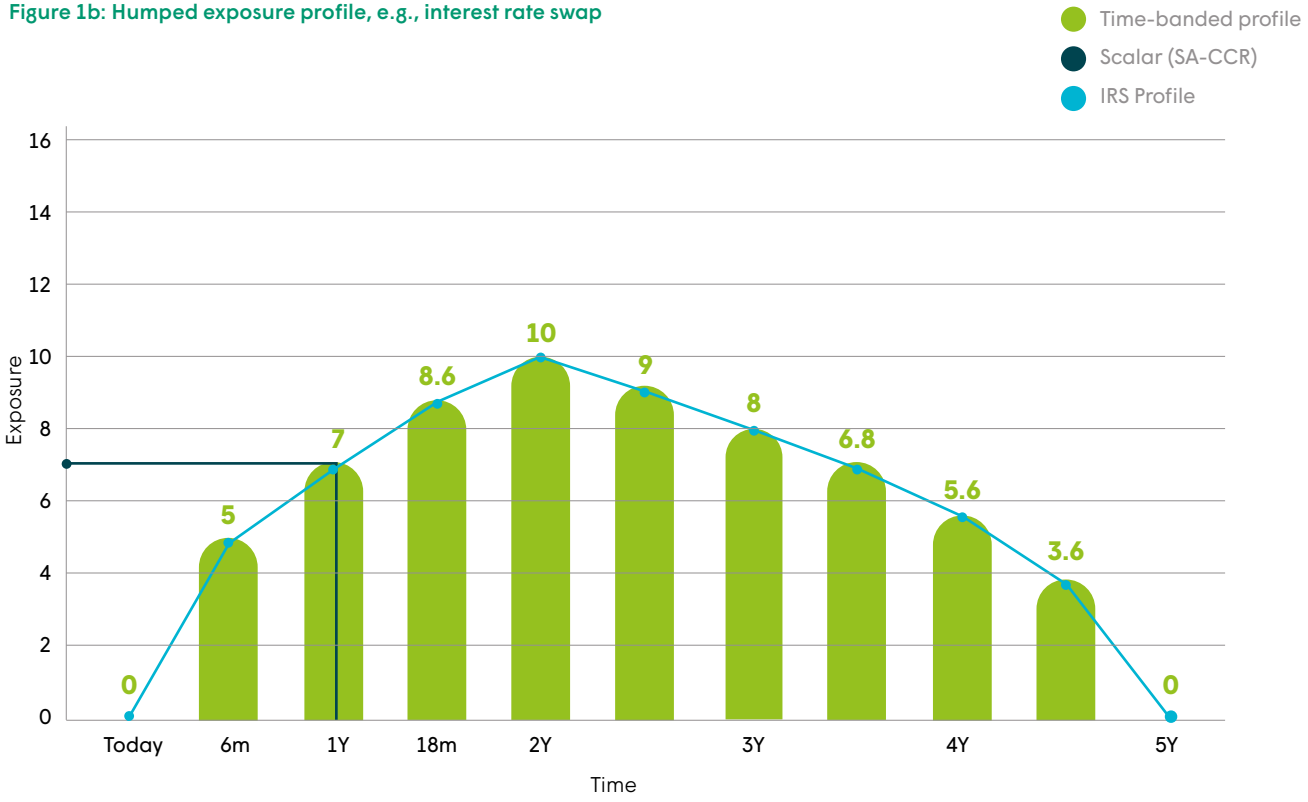


Figure 1b: Humped exposure profile, e.g., interest rate swap



Completeness and accuracy for risk measurement
The SA-CCR weighting factors lack granularity, having been placed on broad asset classes such as interest rates, foreign exchange, equities, etc. Policy-makers may wish to implement more granular weighting factor matrices, e.g., by classifying underlying risk factors such as interest rates, exchange rates, equities and commodities into volatility buckets.

In addition, the SA-CCR does not apply to spot or cash transactions with a market-standard settlement period. Some banks may still wish to recognise that a small amount of pre-settlement risk attaches to such transactions, especially if they do not have settlement limits and/or wish to impose some volume control on such transactions.

Contentious or overly conservative parameters
The rather high "supervisory volatilities" imposed by the SACCR standards have the perverse effect of privileging put options, so banks may wish to apply a different set of volatilities in the calculation of option deltas.

Some other parameters used in the SA-CCR may also prove contentious and hence could be modified or removed by an internal risk management policy:

- The 0.05 floor used in the "multiplier" formula that is applied to netting sets with negative MtMs or that feature over-collateralisation may be removed. The effect of the floor is to always record positive exposure, even for transactions that are significantly out-of-the-money or netting sets that are heavily over-collateralised. In particular, banks may wish to recognise that a portfolio of sold options should not result in positive exposure.
- The 1.5 multiplier applied to the PFE Add-Ons of margined exposures[2] may not be justifiable under a risk management policy. We believe a conservative application of the "margin period of risk" rules should be the correct treatment.

Simplifications
Due to the challenges involved in the delta-weighting of option positions, banks may wish to:

- Simply apply a delta of (1) or (-1) to all options.
- Simply apply a delta of (½) or (-½) to all options.
- Or use delta values calculated by front-office systems.

Conclusion

We believe that many banks that are not currently applying advanced models could benefit significantly from moving towards an SA-CCR inspired system for measuring credit exposures for internal risk management purposes. However, they may need to adapt the SA-CCR methodology in the ways that we highlighted above.

From a systems perspective, it is therefore important that any implementation of the SA-CCR methodology should retain some flexibility in its structure and parameters. This will allow the bank to use the same underlying systems infrastructure for parallel and methodologically consistent calculations of counterparty exposures, whether for regulatory capital, financial reporting, limit utilisation, or internal risk management purposes.

ABOUT THE AUTHOR

Jean-Marc Schwob is product manager, credit risk, for FIS' Adaptiv. In this role, Jean-Marc is responsible for the overall functionality of Adaptiv Credit Risk, a leading credit exposure measurement, management and control solution. This includes determining industry and regulatory trends, future product direction, documenting current and proposed system functionality, 'product specialist' support for sales, plus generating global awareness and interest in the product.

We believe that many banks that are not currently applying advanced models could benefit significantly from moving towards an SA-CCR inspired system for measuring credit exposures for internal risk management purposes.

[1] THE SA-CCR METHODOLOGY DOES INCLUDE A SCALING BASED ON THE "SUPERVISORY DURATION", I.E., THE TENOR OF THE UNDERLYING RISK FACTOR, FOR INTEREST RATE AND CREDIT DERIVATIVES. THIS IS PRESUMABLY BASED ON THE INSIGHT THAT LONGER TENORS HAVE A HIGHER VOLATILITY THAN SHORTER TENORS. THIS IS HOWEVER DIFFERENT TO A (SQRT-T) WEIGHTING BASED ON THE DURATION OF THE EXPOSURE.

[2] THIS MULTIPLIER HAS THE PERVERSE EFFECT OF CAUSING THE PFE OF A SHORT-TERM (≤ 10 DAYS) MARGINED TRANSACTION TO BE HIGHER THAN THE SAME PFE IF IT WERE UNMARGINED. INDEED MARGINED PFE ADD-ONS ARE MULTIPLIED BY 1.5 AND THE SQUARE ROOT OF THE "MARGIN PERIOD OF RISK", WHEREAS UNMARGINED TRANSACTIONS ARE MULTIPLIED BY THE SQUARE ROOT OF THE RESIDUAL MATURITY. ADMITTEDLY, THIS EFFECT IS NEGATED BY THE FLOORING OF MARGINED EXPOSURES TO THE OTHERWISE UNMARGINED CALCULATION, BUT IT IS IN OUR VIEW UNNECESSARY AND INCONSISTENT.

About FIS' Solutions for Risk Management

FIS' solutions for risk management cover pre- and posttrade risk management; integrated, enterprise-wide market, liquidity, credit and operational risk management; asset liability management; and trade surveillance. These solutions can be used across trading and clearing platforms and around multiple asset classes to help organizations better understand their exposure, improve the visibility and understanding of risk across the enterprise, and comply with regulations globally. FIS' customers include banks, broker-dealers, securities firms, clearinghouses, hedge funds, pension funds, asset managers, insurance companies, corporations and government entities of varying sizes,

About FIS

FIS is a global leader in financial services technology, with a focus on retail and institutional banking, payments, asset and wealth management, risk and compliance, consulting and outsourcing solutions. Through the depth and breadth of our solutions portfolio, global capabilities and domain expertise, FIS serves more than 20,000 clients in over 130 countries. Headquartered in Jacksonville, Florida, FIS employs more than 55,000 people worldwide and holds leadership positions in payment processing, financial software and banking solutions. Providing software, services and outsourcing of the technology that empowers the financial world, FIS is a Fortune 500 company and is a member of Standard & Poor's 500® Index. For more information about FIS, visit **www.fisglobal.com**

www.fisglobal.com

twitter.com/fisglobal

getinfo@fisglobal.com

linkedin.com/company/fisglobal