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Data and Systems Challenges and Solutions:
The Standardised Approach to Counterparty Credit Risk

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Introduction

- SA-CCR will replace both current non-internal models approaches, the Current Exposure Method (B1-3) and the Standardised Method (B2-3).

- Basel paper cites start date of 2017 although CRR2 will likely be 2019.

- Basel Committee objectives include:
  - Addresses known deficiencies of the CEM and the SM;
  - Develop a framework suitable to both margined and un-margined, as well as bilateral and cleared transactions;
  - Improves the risk sensitivity of the capital framework without creating undue complexity.
  - Capable of being implemented simply and easily;

- In this talk, we examine the practical aspects of implementation.
  - Hedging and Netting sets.
  - Contract, Collateral and Counterparty reference data.
  - Supervisory parameters.
  - Aspects of solution architecture.

SA-CCR Methodology Framework

- The exposures under the SA-CCR consist of two components: replacement cost (RC) and potential future exposure (PFE).
- Mathematically, **EAD = alpha * (RC + PFE)**
- The methodology is based on concept of a "**hedging set**", a set of comparable transactions within a single netting set.

Interest Rates	FX	Credit	Equity	Commodity
• CCY • Maturity • Full offset possible within M bucket • Partial offset otherwise.	• CCY Pair • Full offset possible per pair.	• Single set. • Full offset by reference name. • Partial offset elsewhere.	• Single set. • Full offset by reference name. • Partial offset elsewhere.	• Energy • Metals, • Agricultural, • Other. • Full offset permitted by commodity. • Partial offset within set.

Implementation Issues:

- How to map individual trades correctly within this setup?
  Substantial amounts of trade data required to facilitate this.
- What hedging set is used for multi-factor products, e.g. quantos?
  Pre-determined selection rules required for all applicable products.

Collateral and Contract Management

SA-CCR framework updated to align with the contemporary world of collateral management.

$$RC = \max\{ V\text{-}C; TH + MTA - NICA; 0\}$$

Where:

- *V* is trade value, and *C* is collateral already received.
- *TH + MTA – NICA* represents the largest exposure that would not trigger a margin call and it contains levels of collateral that need always to be maintained.

Excess collateral also recognised via PFE reduction:

$$multiplier = \min\left\{1; Floor + (1 - Floor) * \exp\left(\frac{V - C}{2 * (1 - Floor) * AddOn^{aggregate}}\right)\right\}$$

This allows for a reduction of up to 95% of PFE.

Add-ons also modified by Maturity (un-margined trades) Margin Period of Risk (margined).

- 10 day MPOR for daily margined OTC trades, 5 days for CCPs.
- 20 days for OTC trades with >5,000 trades.
- Doubles in the presence of a margin dispute.

Implementation Issues:

- Identify contract reference data, e.g. MTA and TH amounts.
- Sourcing up-to-date collateral values.
- How many trades? – not easy in a fragmented system setup.
- Where are collateral disputes booked?
- Seamlessly integrate at the correct netting set / legal agreement level

Supervisory Parameters

δ_i	*Bought*	*Sold*
Call Options[13]	$+\Phi\left(\frac{\ln(P_i / K_i) + 0.5 * \sigma_i^2 * T_i}{\sigma_i * \sqrt{T_i}}\right)$	$-\Phi\left(\frac{\ln(P_i / K_i) + 0.5 * \sigma_i^2 * T_i}{\sigma_i * \sqrt{T_i}}\right)$
Put Options[7]	$-\Phi\left(-\frac{\ln(P_i / K_i) + 0.5 * \sigma_i^2 * T_i}{\sigma_i * \sqrt{T_i}}\right)$	$+\Phi\left(-\frac{\ln(P_i / K_i) + 0.5 * \sigma_i^2 * T_i}{\sigma_i * \sqrt{T_i}}\right)$

Supervisory delta does not work in the presence of negative rates!

- Absent supervisory guidance, Banks will need to make workaround assumptions;
- E.g. set Spot = Epsilon for trades with positive strikes and –Epsilon for negative strikes.

- Supervisory delta not designed for negative rates.

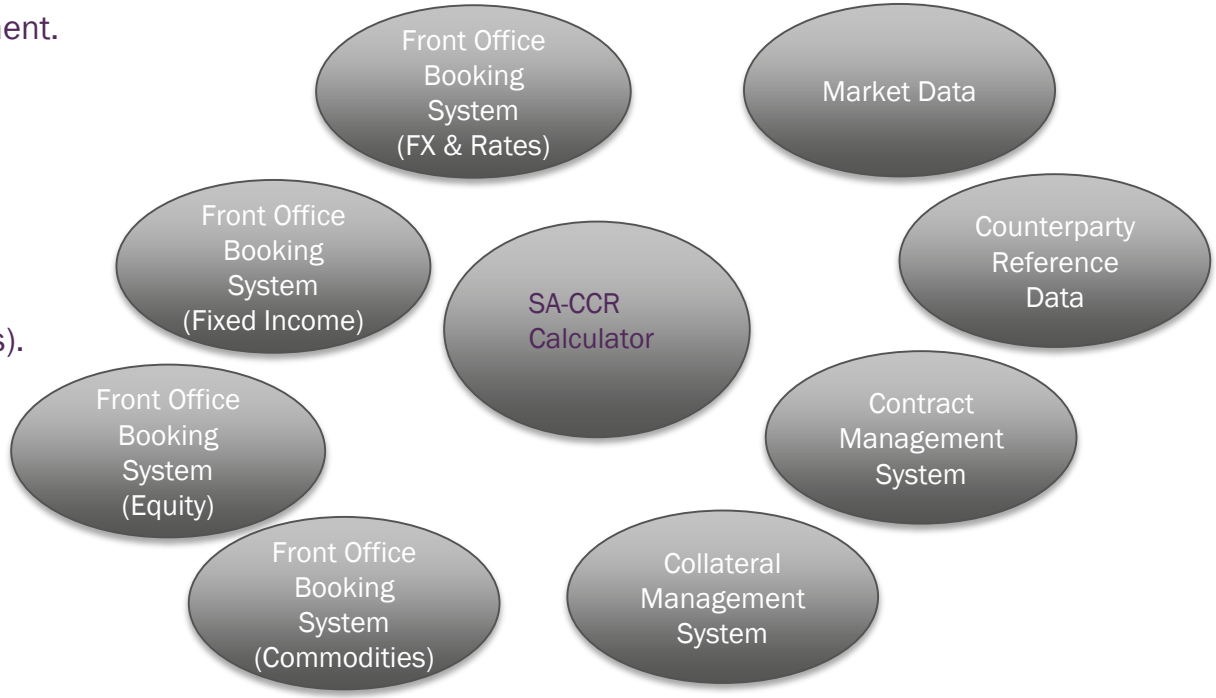
SA-CCR Solution Architecture

The Past

- Basel I was a GL implemented system.
- Credit risk exposure reporting still traditionally a finance led operation.
- CEM (just about) implementable by sourcing sub-ledger data to credit warehouse.
- SA-CCR will not work in this ledger environment.

Required Now?

- Single, central CCR system.
- All parts of Bank must use! – not just FM.
- Multiple system interfaces (not file transfers).
- Many challenges to overcome!



- Many data required: trade, market, collateral, contract.
- Also requires multiple system interfaces.

Conclusions

The traditional three-way challenge of implementation applies as equally to this as it does to other risk projects:

- **Policy**
- Specifically, the need to make firm specific decisions about e.g. mappings and supervisory deltas.
- Document decisions and ensure correct approvals → Steering Committee not always the correct place.

- **Methodology**
- Implementation of the myriad formulae will test the robustness of the data structure: easier with fewer systems.
- Ensure flexible implementation to reduce complexity of scaleability.

- **Infrastructure**
- The more fragmented the starting point, the harder the road to the destination.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