

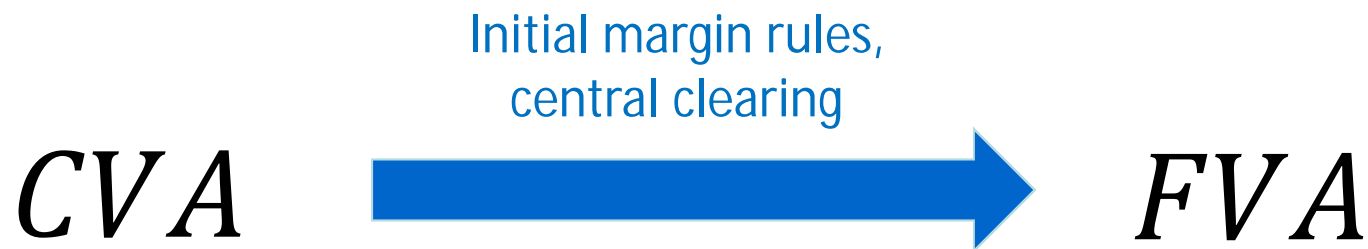


**The Impact of Central Clearing:
A Study via the Balance of CVA, DVA and FVA**

Jon Gregory, Partner

- **In order to reduce systemic risk, the G20 agreed in 2009 to require**
 - All standardised OTC derivatives should be traded on exchanges or electronic platforms
 - Central clearing of standardised OTC derivatives
 - Reporting of OTC derivatives to trade repositories
 - Higher capital requirements for non-centrally-cleared OTC derivatives
- **In 2011, initial margin requirements for non-centrally cleared derivatives were added**
 - Financial entities and systemically important non-financial entities are covered
 - Initial margin is “defaulter pays” and reduces systemic risk
 - Typically cash or highly liquid assets (high quality government / central bank securities)
 - Phased in (from 1st December 2015 and dependent on local regulator)

G20 Pittsburg Summit Declaration, www.g20.utoronto.ca/2009/2009communique0925.html



CVA, DVA and FVA

Central Counterparties

Impact of Thresholds and Initial Margins

Optimisation of CVA, DVA and FVA

“Risk-free” or idealistic valuation

$$\text{Value} = \overbrace{\text{Risk free value}}$$

$$- CVA + DVA$$

Counterparty risk

$$\pm FVA$$

Cost of funding the position

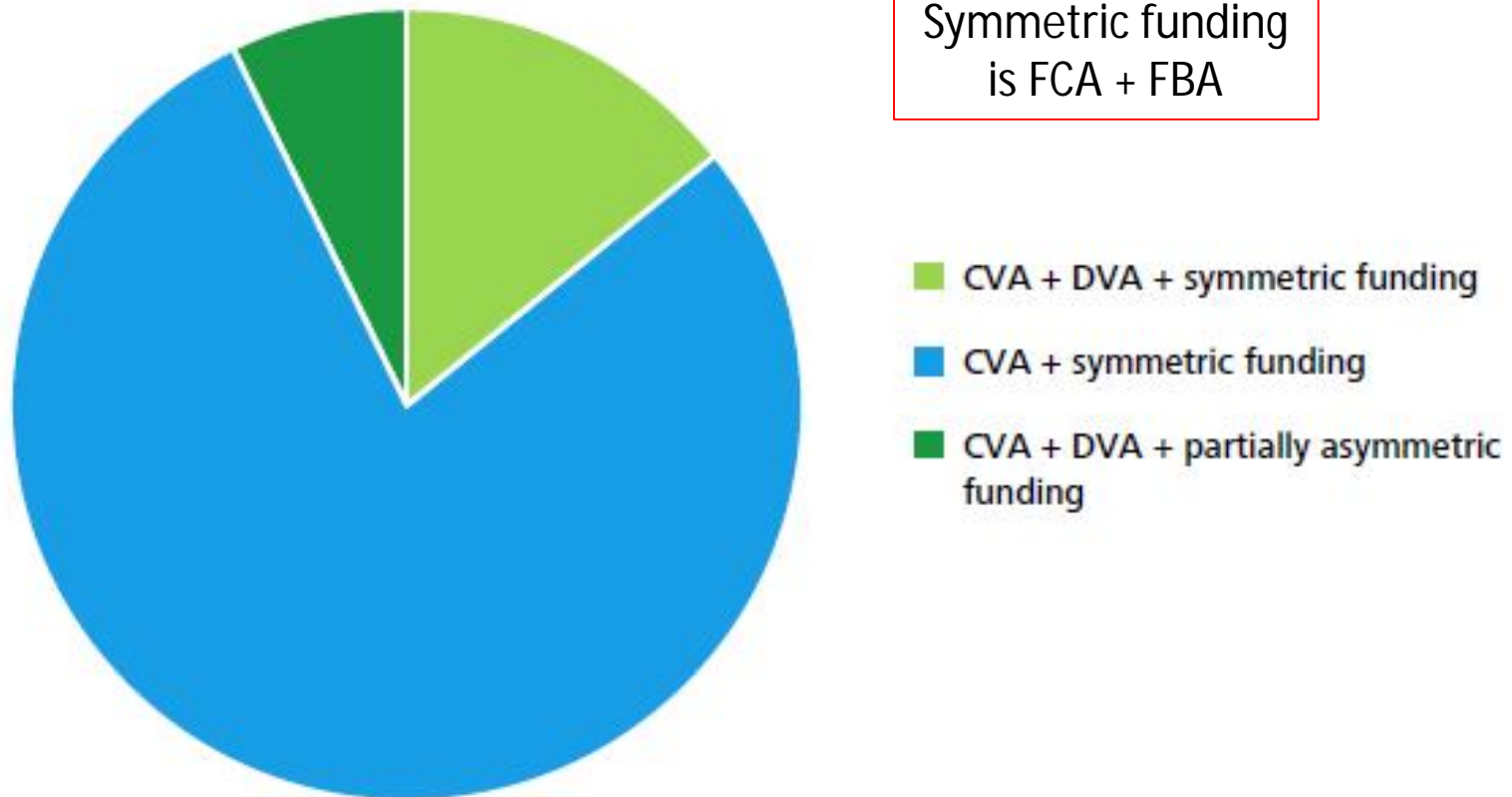
$$\pm CollVA$$

Optionality from collateral (CSA terms)

$$\pm KCVA$$

Cost of holding capital (regulatory and/or economic)

Figure 44. Inclusion of CVA, DVA and funding



Source: Deloitte and Solum CVA and FVA Survey 2013

*“During 2012, a fair-value adjustment was applied to account for the impact of incorporating the **cost of funding** into the valuation of **uncollateralised derivatives**”*

*“Valuation adjustments are integral to determining the fair value of derivatives [including] credit valuation adjustments and **funding valuation adjustments**.”*

*“The group has recognised a funding valuation adjustment [of £143 million] to adjust for the net cost of **funding certain uncollateralised derivative positions** where the group considers that this cost is included in market pricing.*

FVA and Accounting (II)

	2012 £m	2011 £m
At 1 January	1,226	570
Income statement (credit) charge	(209)	718
Transfers	(120)	(62)
At 31 December	897	1,226

Represented by:

	2012 £m	2011 £m
Credit Valuation Adjustment	928	1,425
Debit Valuation Adjustment	(174)	(493)
Funding Valuation Adjustment	143	294
	897	1,226

Credit and Debit Valuation Adjustments (CVA and DVA) are applied to the Group's over-the-counter derivative exposures with counterparties that are not subject to standard interbank collateral arrangements. These exposures largely relate to the provision of risk management solutions for corporate customers within the Commercial Banking division.

A CVA is taken where the Group has a positive future uncollateralised exposure (asset). A DVA is taken where the Group has a negative future uncollateralised exposure (liability). These adjustments reflect interest rates and expectations of counterparty creditworthiness and the Group's own credit spread respectively.

- The market seems to have more or less converged on the following counterparty risk and funding components:

$$CVA + \underbrace{DVA}_{\text{Funding benefit}} + \underbrace{FCA}_{\text{Funding cost}}$$

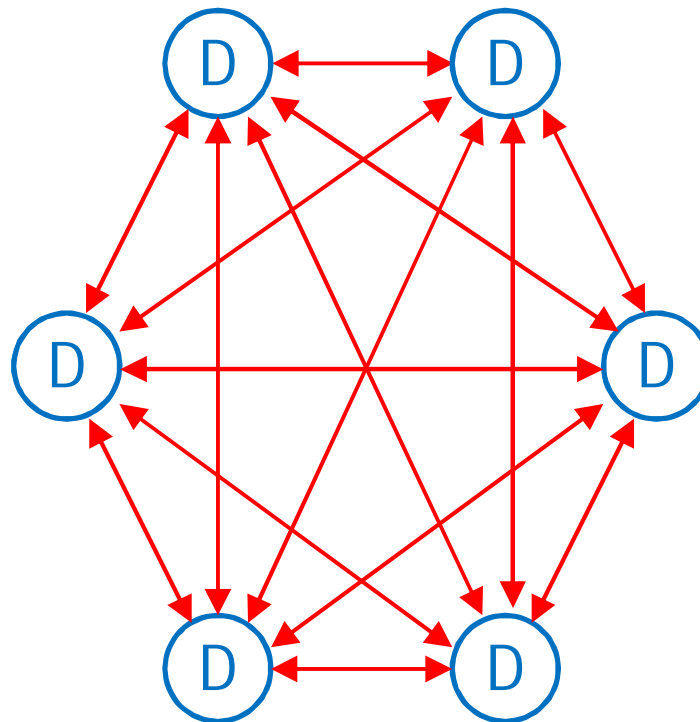
- There do remain some issues with the precise specification and overlap
 - FVA should not be included in a valuation (Hull and White)
 - If both CVA and DVA can be perfectly hedged then there is no funding term (Burgard / Kjaer)
 - Basis issues (funding cost vs. own CDS)
- Initial margin is a special case and will be an extra funding cost
 - I'll consider this is a component of FVA

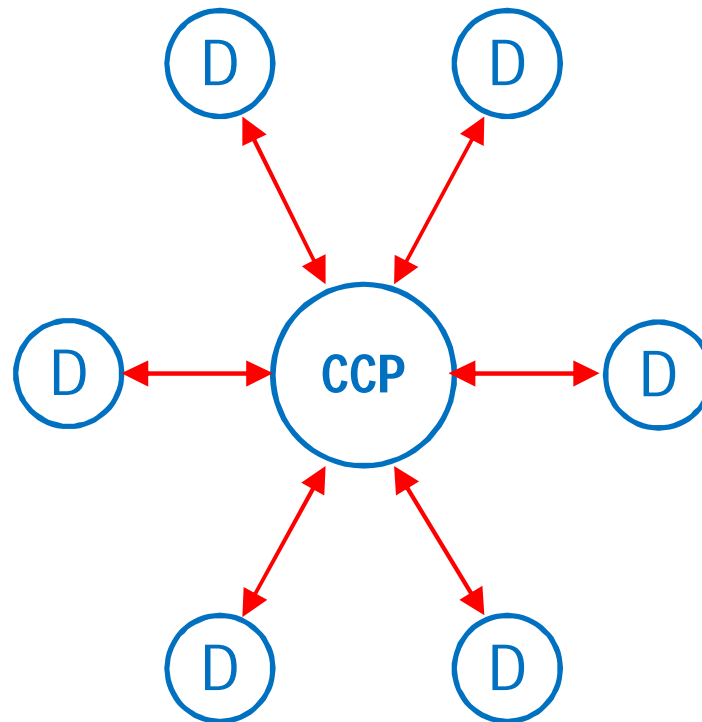
CVA, DVA and FVA

Central Counterparties

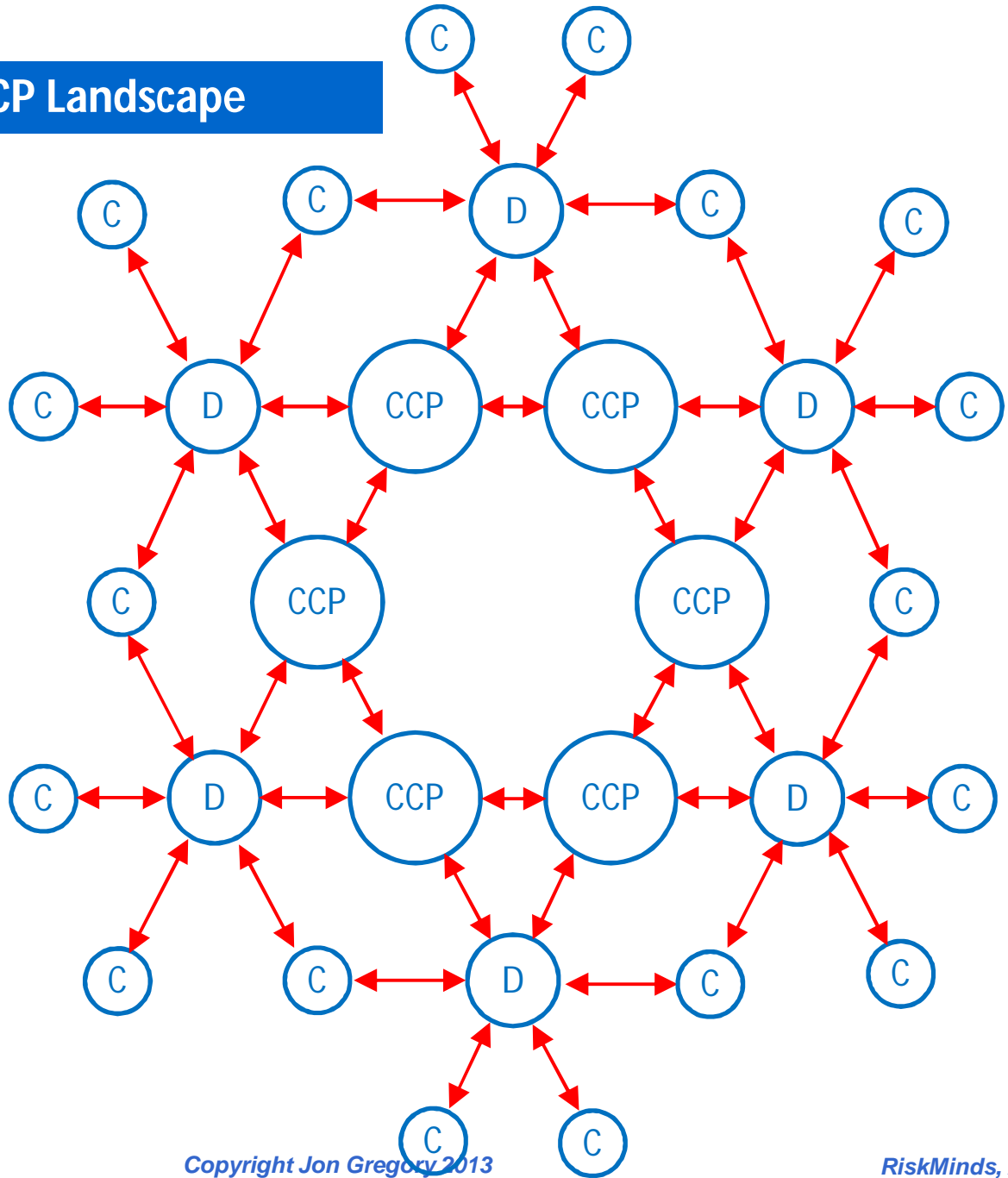
Impact of Thresholds and Initial Margins

Optimisation of CVA, DVA and FVA





CCP Landscape



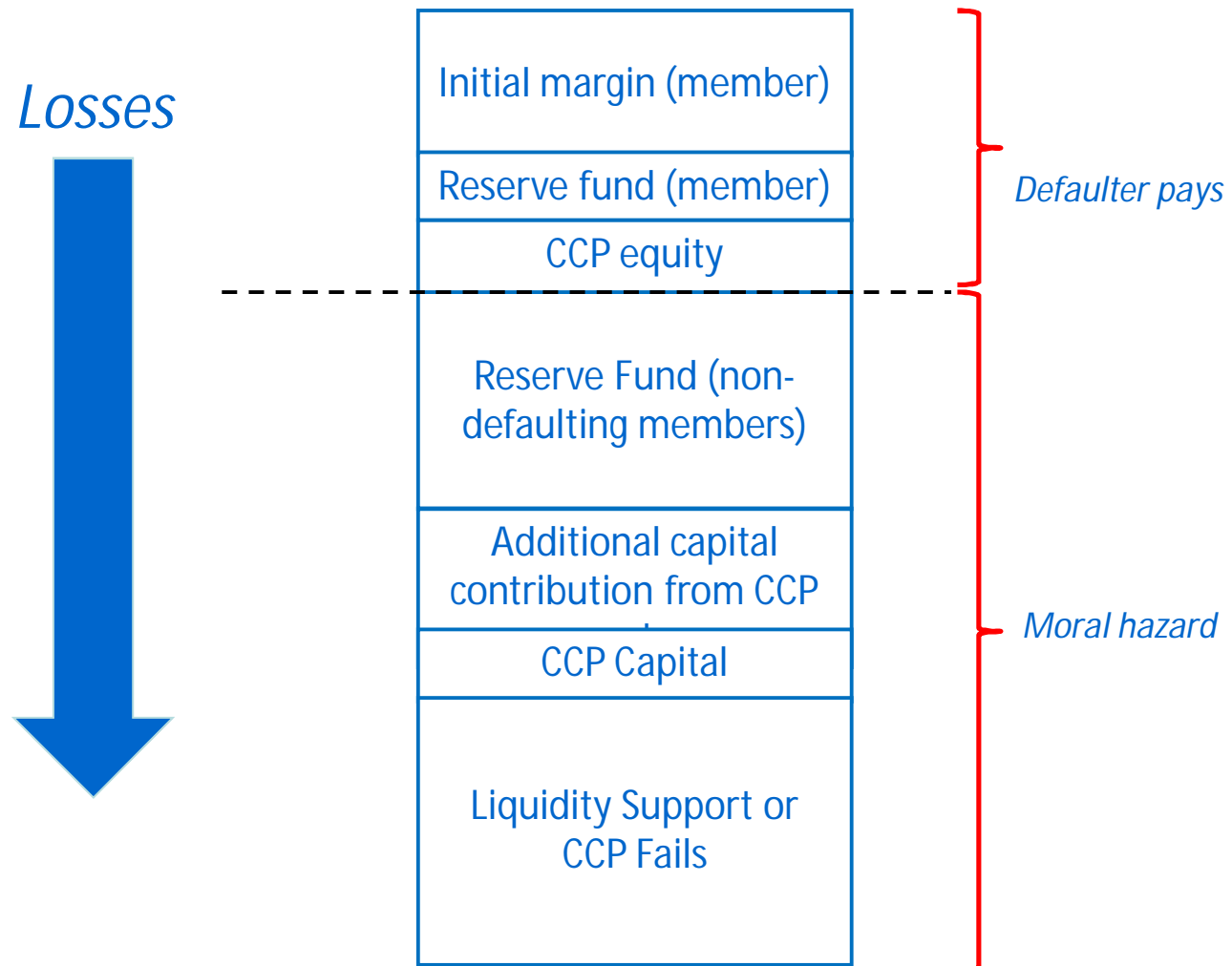
How do clients get treated in a CCP market ?

Are CCPs interconnected?

Large dealers members of multiple CCPs?

Note there may also be "indirect clients" which are clients of clients

- Initial margin is primary financial resource for a CCP

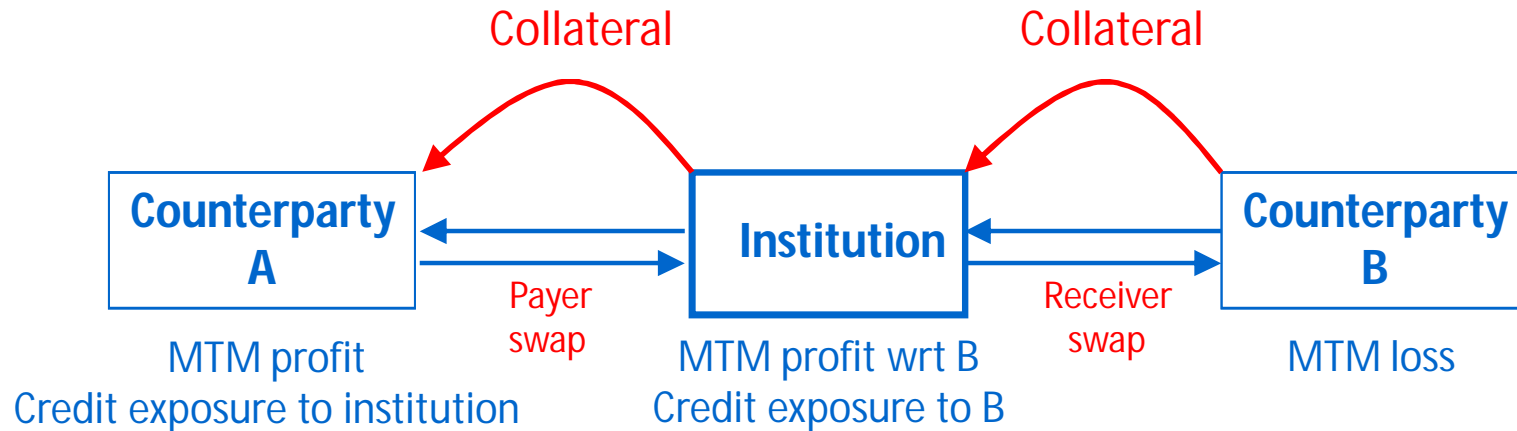


CVA, DVA and FVA

Central Counterparties

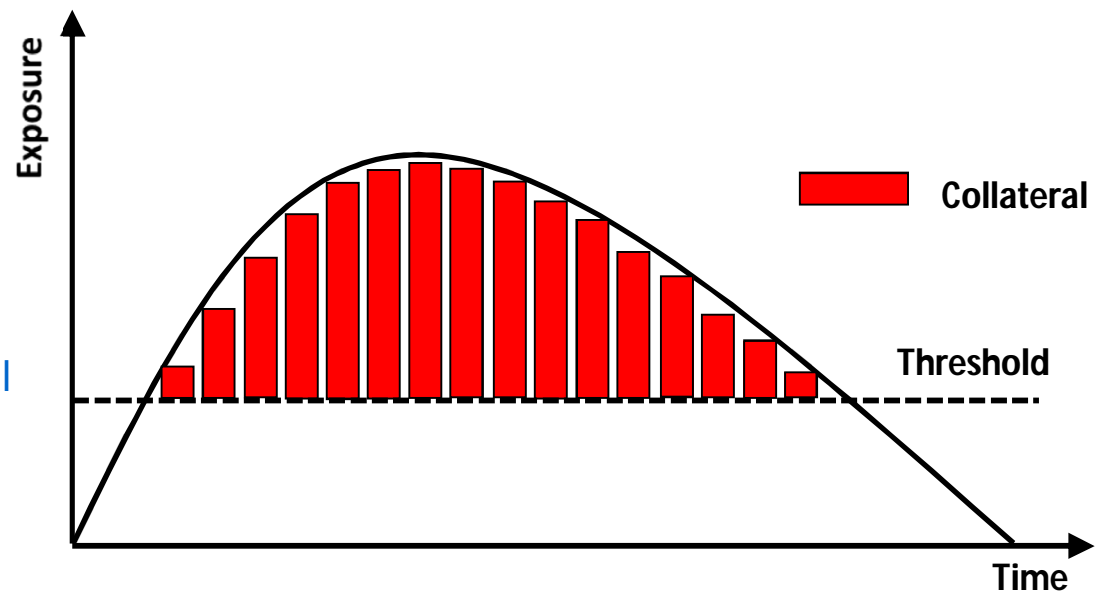
Impact of Thresholds and Initial Margins

Optimisation of CVA, DVA and FVA



• **BUT**

- Initial margins
- Thresholds
- Margin period of risk
- Rehypothecation of collateral
- Collateral volatility
- Wrong way collateral



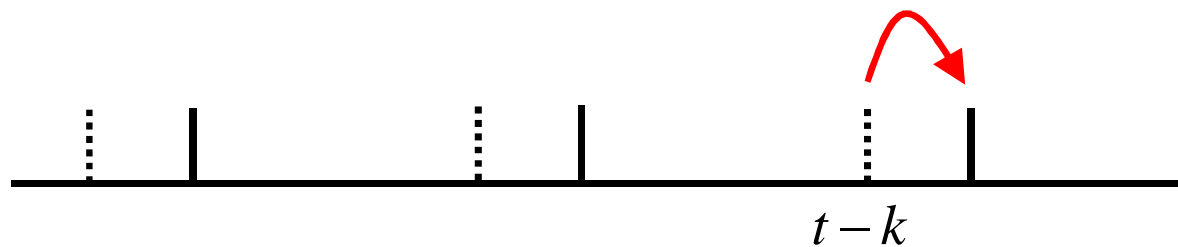
Calculating Exposure with Collateral

$$E_t = \max(V_t - C_{t-k}, 0)$$

Positive exposure
at time t

Future value
at time t

Total collateral account
 k days ago



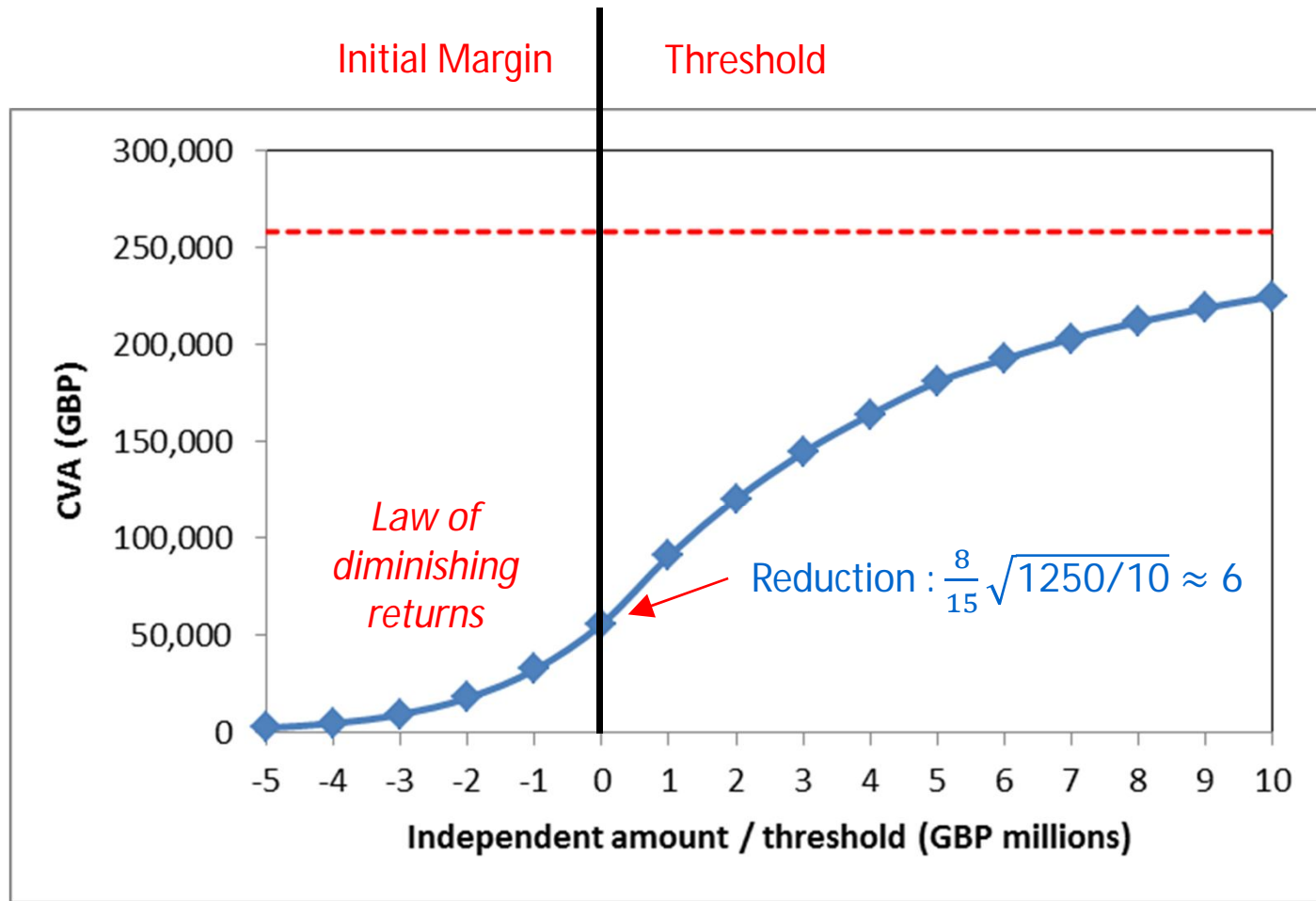
1d	
1w	
2w	
1m	1m-10d
2m	2m-10d
3m	3m-10d
4m	4m-10d
5m	5m-10d
6m	6m-10d
9m	9m-10d
12m	12m-10d
15m	15m-10d
18m	18m-10d
21m	21m-10d
24m	24m-10d
27m	27m-10d
30m	30m-10d
33m	33m-10d
36m	36m-10d
39m	39m-10d
42m	42m-10d
45m	45m-10d
48m	48m-10d
51m	51m-10d
54m	54m-10d
57m	57m-10d
60m	60m-10d

- **Obvious problems**

- Imperfect collateral parameters (can't ask for enough)
- Time to receive collateral (k or the "margin period of risk")
- Volatility of collateral
- Need to post collateral ourselves

CVA with Initial Margin / Threshold

Zero threshold, 10 (business)-day margin period of risk



CVA, DVA and FVA

Central Counterparties

Impact of Thresholds and Initial Margins

Optimisation of CVA, DVA and FVA

- **To reduce counterparty risk (CVA), collateral is ideally**
 - Not adversely correlated to credit quality of counterparty
 - Good credit quality
 - Segregated
- **To provide a funding benefit (FVA)**
 - Re-usable (re-hypothecation) and therefore not segregated
- **Traditionally, this is not a problem**
 - High quality variation margin in a typical CSA (only small risk due to non-segregation)
- **But there are some conflicts which are especially important going forward**
 - Segregation of initial margin (good for CVA, bad for FVA)
 - Sovereign posting own bonds (good for FVA, bad for CVA)

- **Normally we think of exposure for both counterparty risk and funding**
 - Counterparty risk exposure – what we lose when a counterparty defaults (CVA)
 - Funding exposure – what we have to fund (FVA)
- **These are equivalent unless segregation is an issue (most likely with initial margins)**

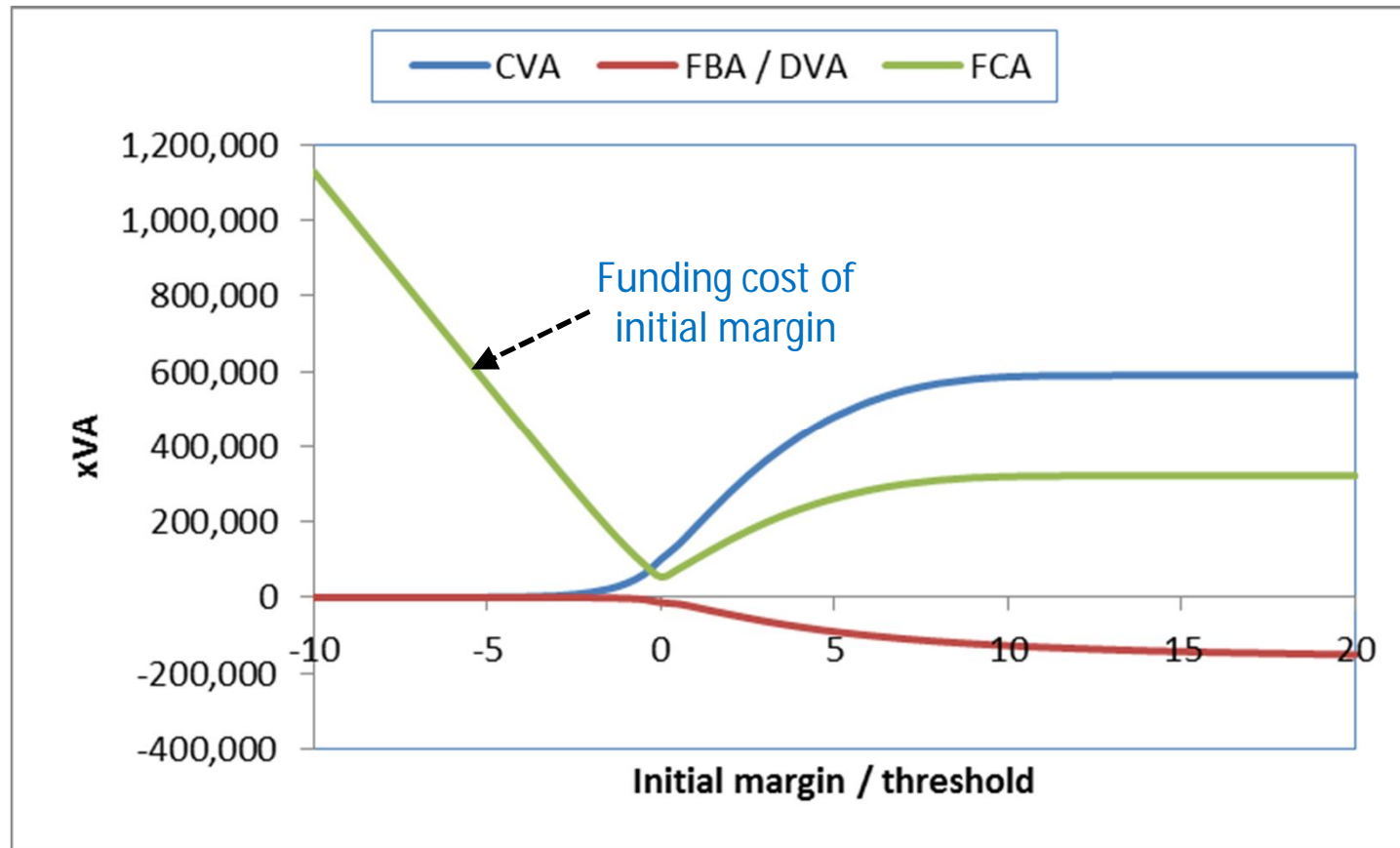
$$Exposure_{CVA} = (RC - VM - \underbrace{IM_c}_{\substack{\text{Initial margin} \\ \text{held}}})^+$$

*VM = variation margin
(assumed re-usable)*

*IM = initial margin
(assumed segregated)*

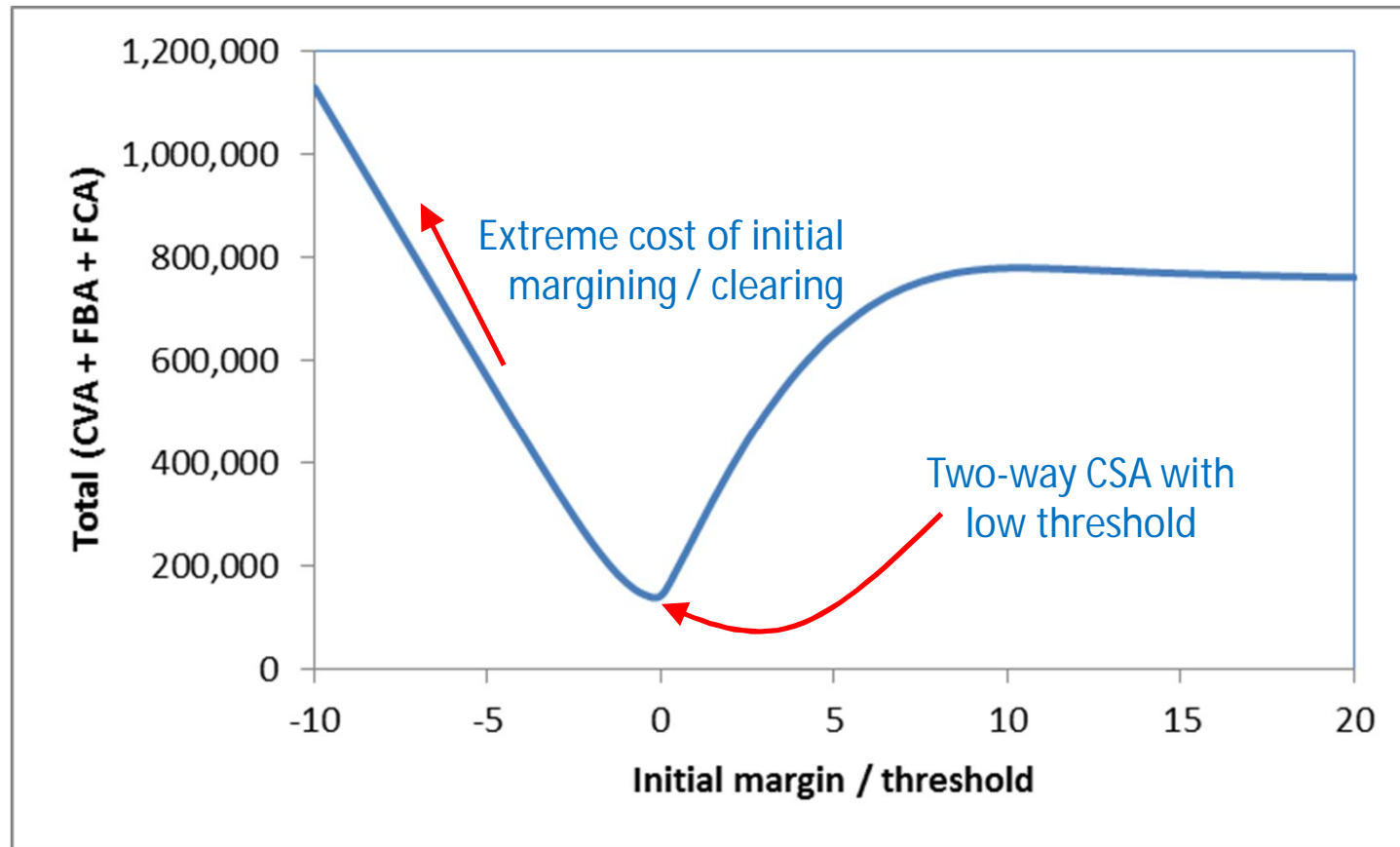
$$Exposure_{FVA} = (RC - VM)^+ + \underbrace{IM_I}_{\substack{\text{Initial margin} \\ \text{posted}}}$$

This example is for a quite funding costly portfolio



Centrally Cleared ← CSA ← No CSA

Overall impact of CVA and FVA



Centrally Cleared ← CSA ← No CSA