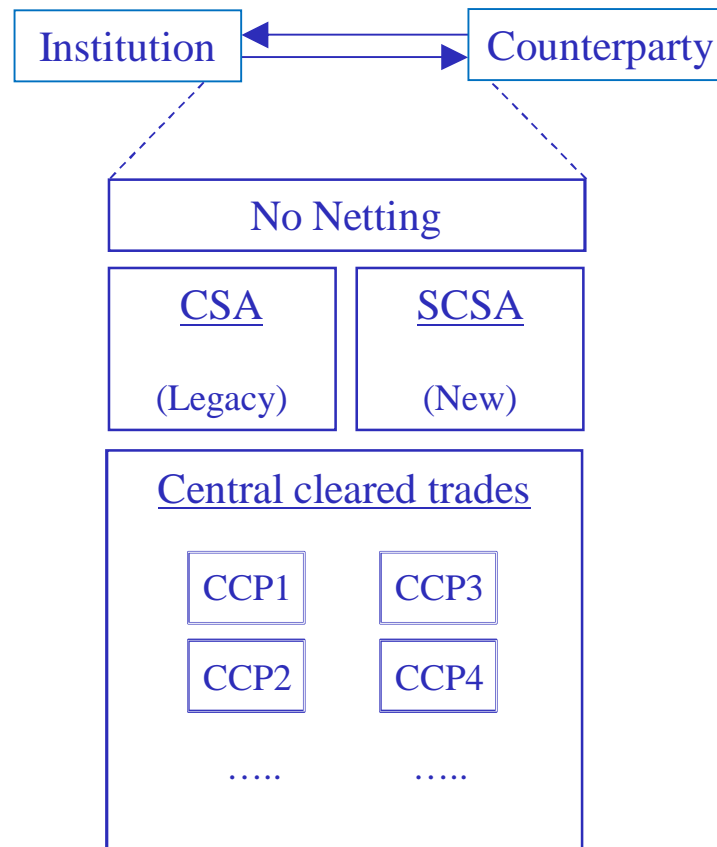


The Benefits and Dangers of Mitigating CVA

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OTC Derivative Trading Relationships



CVA is a Challenge

- Quantification
 - Calculation of exposure as option position
 - Portfolio position implies a multi-asset underlying
 - Hard to determine credit curves for many counterparties
 - Wrong-way risk
 - Debate over DVA
- Hedging
 - Management of a cross asset credit contingent book
 - Trade on only one side of the market
 - Some risks are not directly hedgeable
 - Wrong way risk causes negative gamma and cross gamma

Unintended Consequences of CVA

“... given the relative illiquidity of sovereign CDS markets a sharp increase in demand from active investors can bid up the cost of sovereign CDS protection. CVA desks have come to account for a large proportion of trading in the sovereign CDS market and so their hedging activity has reportedly been a factor pushing prices away from levels solely reflecting the underlying probability of sovereign default.”

Bank of England Q2



Source: Barclays Capital

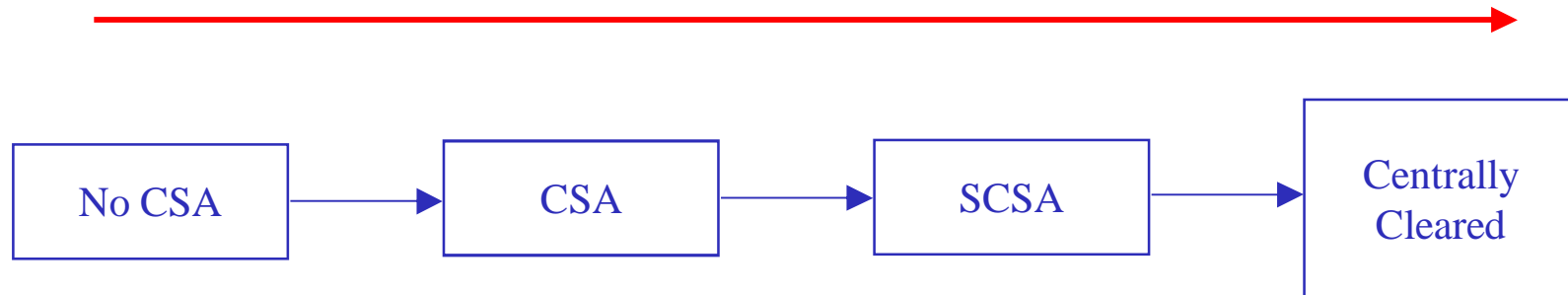
- CVA desks with similar hedging requirements
 - Extreme moves in a single variable (e.g. spread blowout)
 - Sudden change in co-dependency between variables (creating cross gamma issues)
 - At this point do we stop hedging bear the pain?

Counterparty Risk Mitigation Methods

- Netting
 - Payment and closeout netting very well used and standard in most jurisdictions
 - Some legal risk exists but minor
 - Trade compression
 - Allows multilateral netting up to a point (diminishing returns)
 - Small operational risk exists
-
- Collateral
 - CSAs allow further reduction of exposure, technically to zero
 - But risk mitigation is problematic and can lead to significant operational and liquidity risk
 - Central clearing
 - Gets rid of CVA
 - But creates a new too big to fail problem and potentially severe liquidity problems

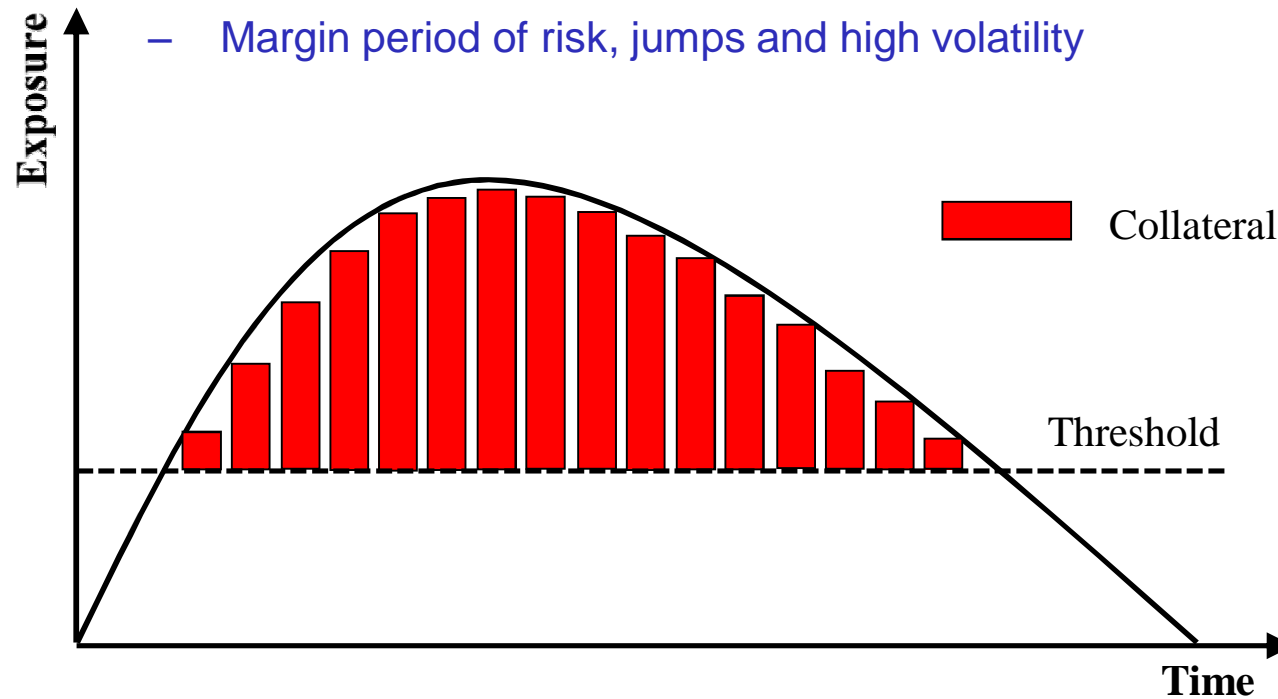
The Impact of Collateral

Reduce Counterparty Risk

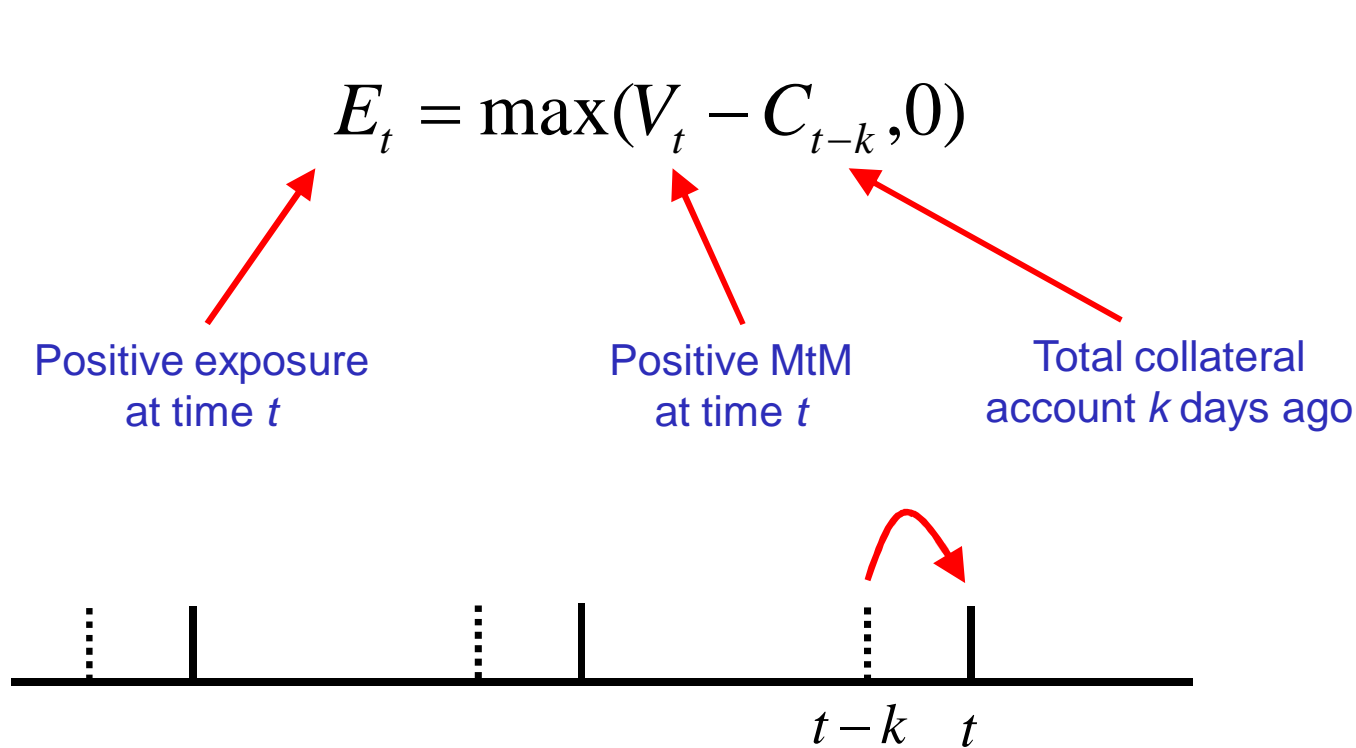


Collateral

- Issues?
 - Operational risk / liquidity risk
 - Cash? Rehypothecation? Cheapest to delivery optionality
 - Margin period of risk, jumps and high volatility



Calculating Exposure with Collateral

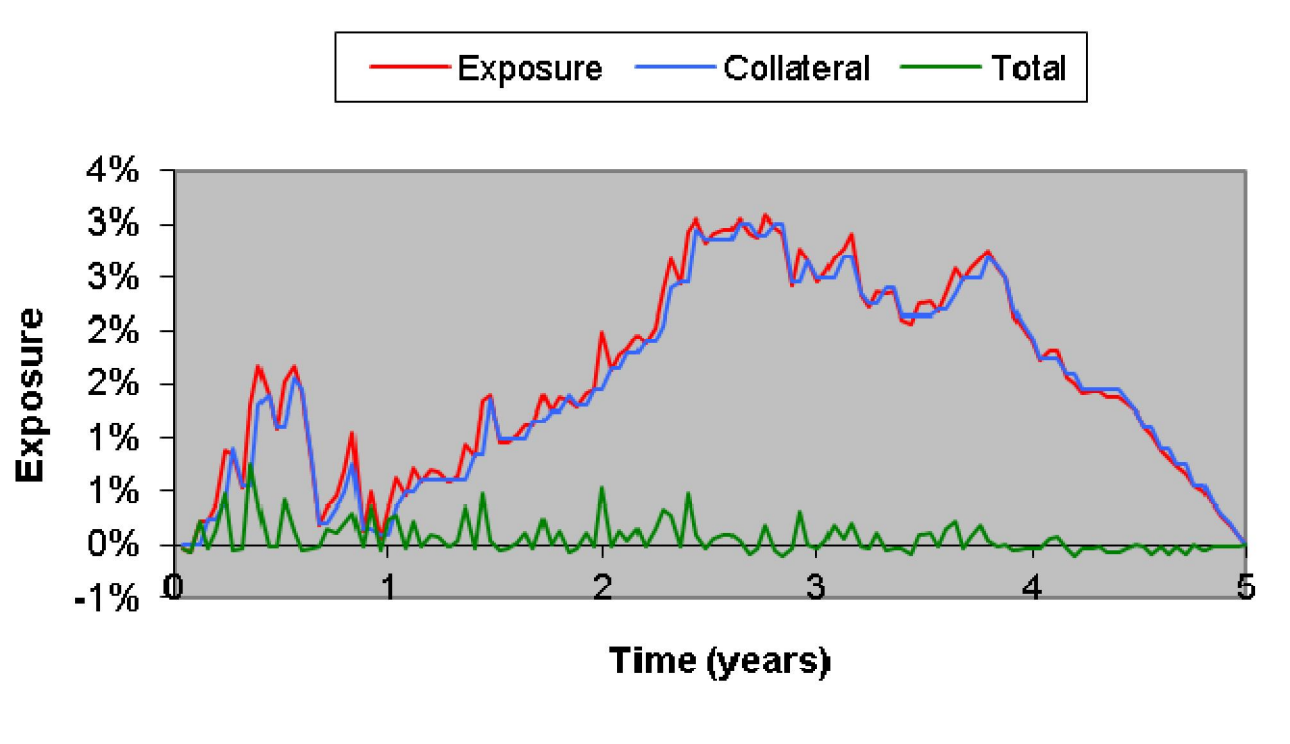


1d	
1w	
2w	
1m	1m-10d
2m	2m-10d
3m	3m-10d
4m	4m-10d
5m	5m-10d
6m	6m-10d
9m	9m-10d
12m	12m-10d
15m	15m-10d
18m	18m-10d
21m	21m-10d
24m	24m-10d
27m	27m-10d
30m	30m-10d
33m	33m-10d
36m	36m-10d
39m	39m-10d
42m	42m-10d
45m	45m-10d
48m	48m-10d
51m	51m-10d
54m	54m-10d
57m	57m-10d
60m	60m-10d

- Obvious problems
 - Can't ask for enough collateral
 - Can't get it quickly enough
 - Have to post collateral ourselves

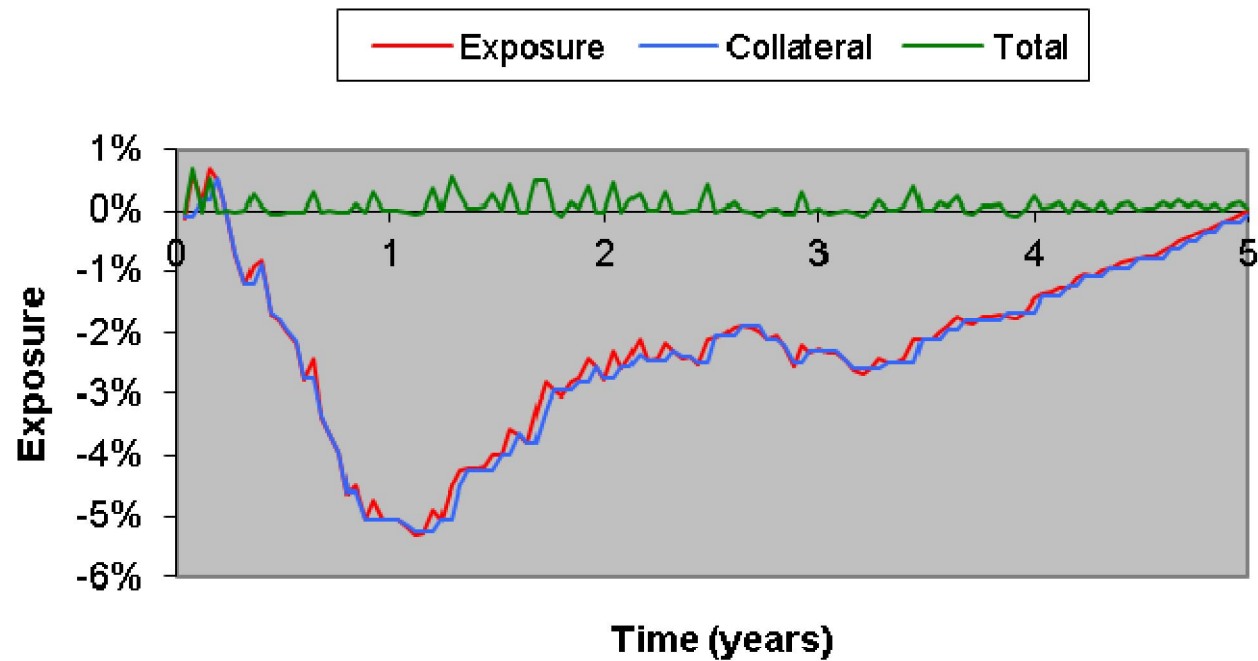
Taking Collateral Reduces Risk

- Zero threshold – impact of delay and minimum transfer amount



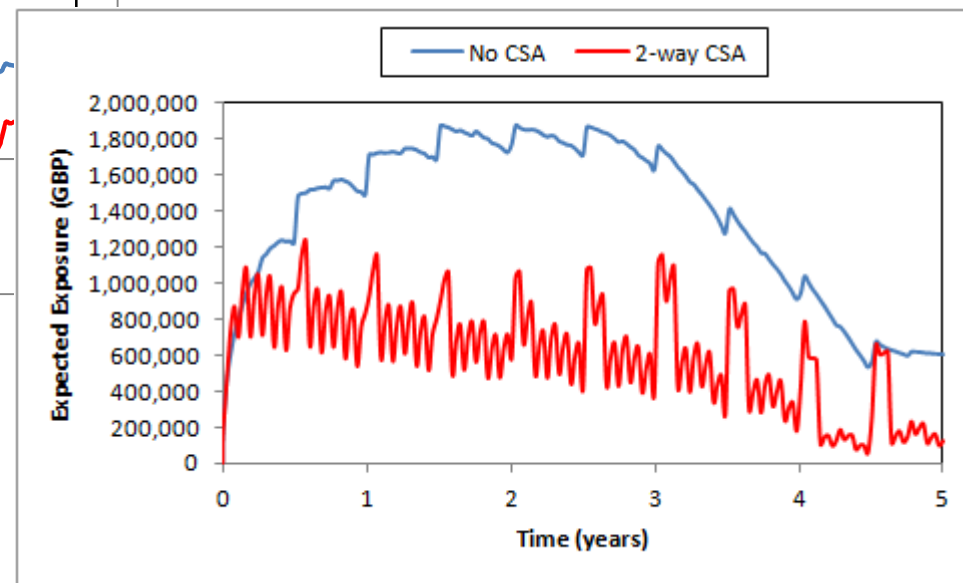
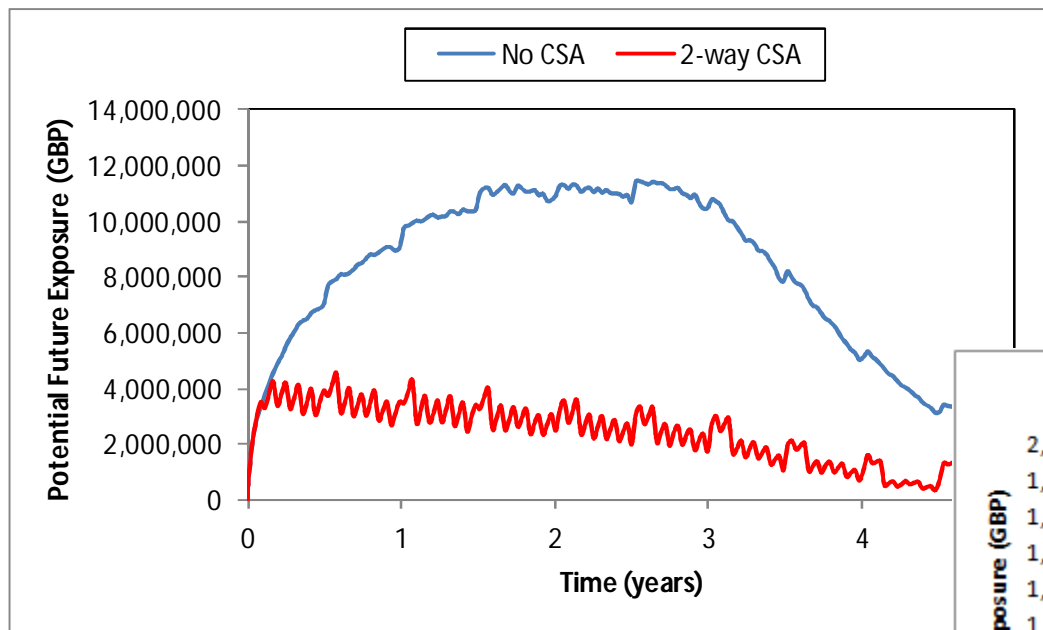
Returns Increase Risk

- Zero threshold, two-way CSA



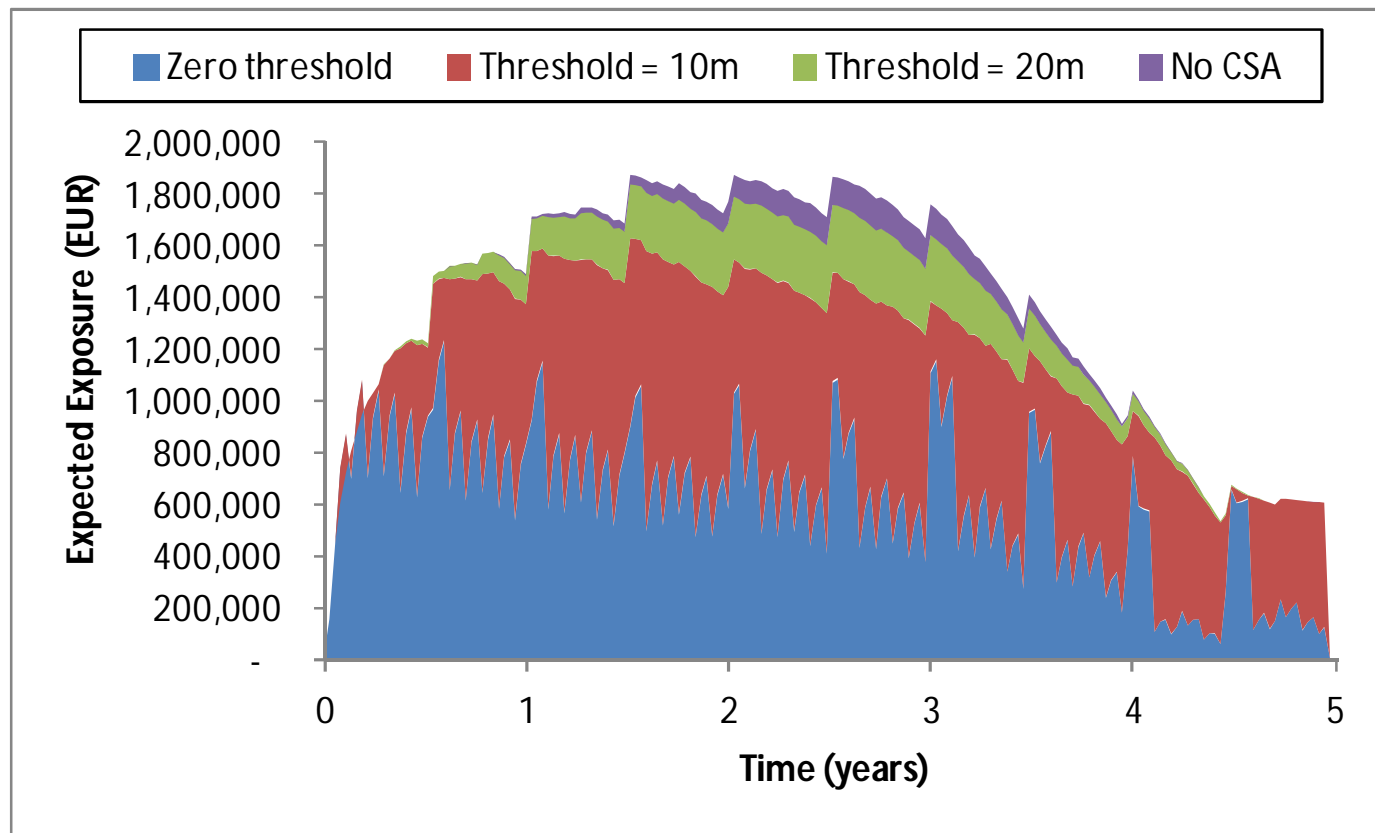
A CSA Reduces PFE more than CVA

- Impact of two-way CSA on PFE and EE (CVA)

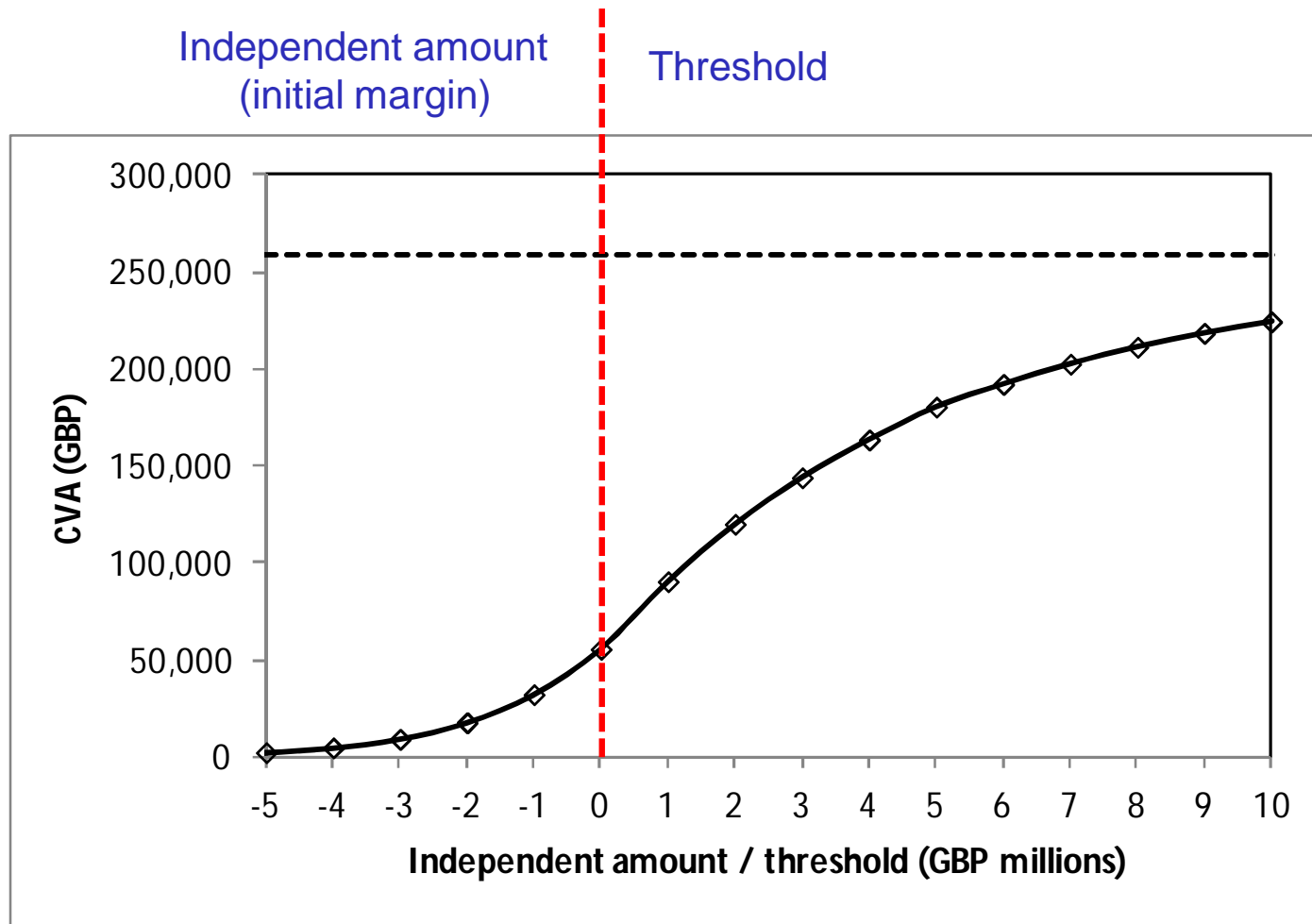


CSA Impact on CVA

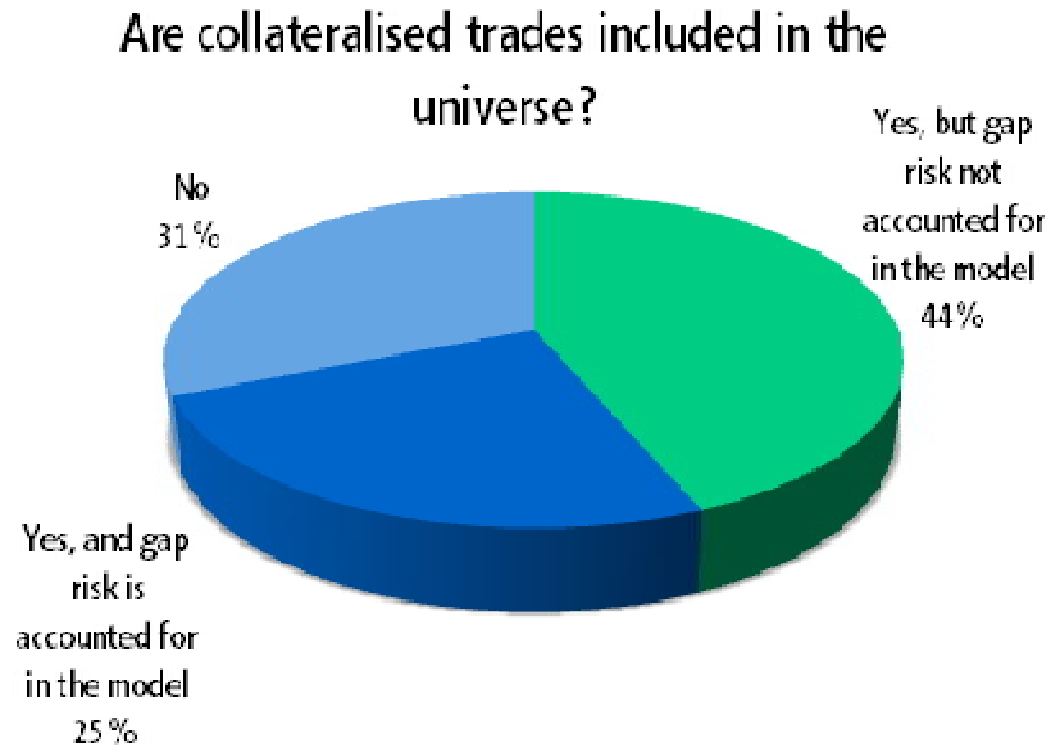
- Impact of CSA on exposure assuming 20-day remargin period (Basel 3)



CVA With Independent Amount / Threshold

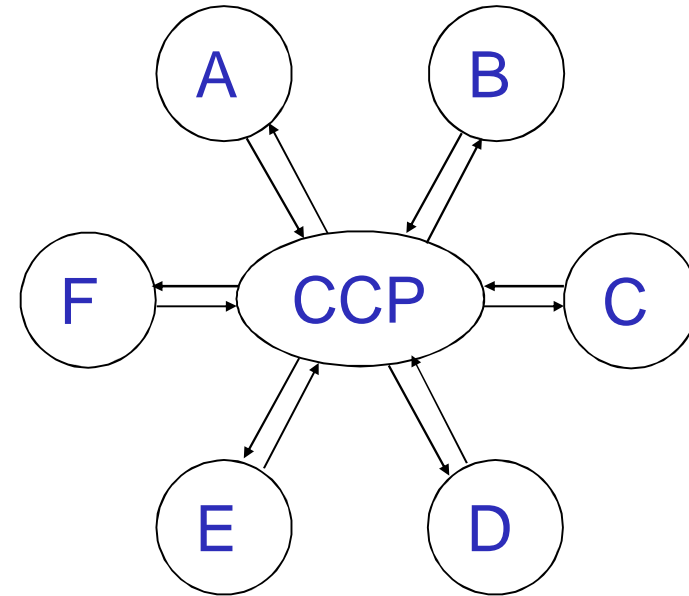
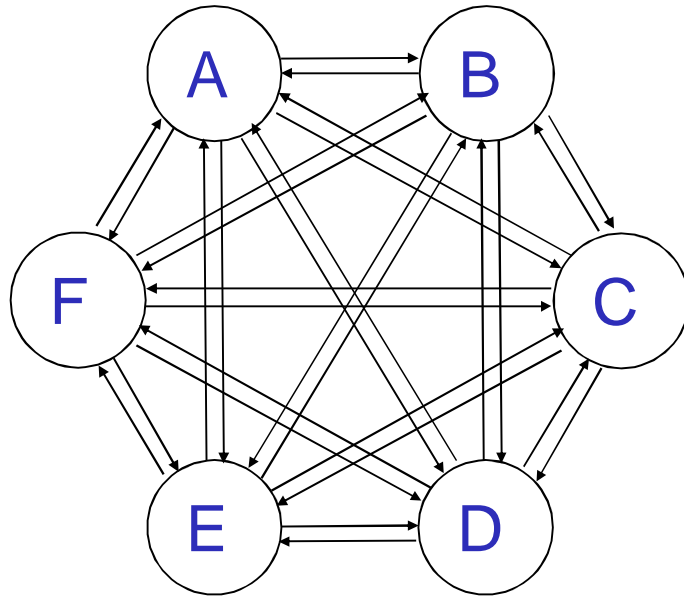


CVA and Collateralised Trades



Solum CVA Survey July 2010

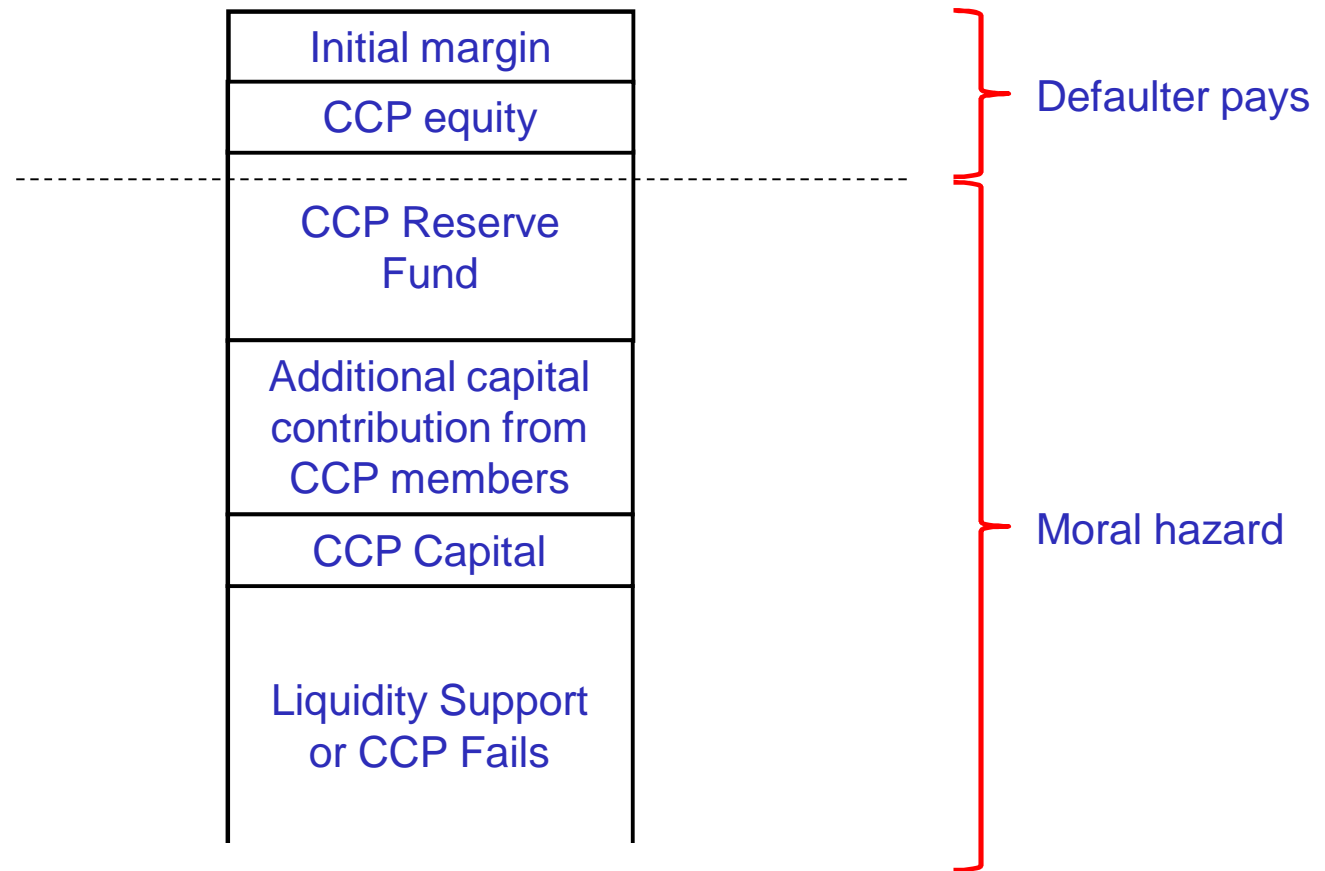
Central Counterparties



- Impact of CCPs (and initial margin requirements) in the future
 - CCPs overcollateralise and do not charge CVA
 - Strong incentives and/or requirements to centrally clear OTC derivatives
 - Moral hazard – CCP members *could* be exposed to default losses if a member defaults no matter what their positions with that member were
 - A new “too big to fail” problem

CCP Loss Waterfall

- Allocation of losses after CCP has closed out trades and liquidated variation margin



Logistical Questions for a CCP





- How many CCPs should there be?
 - **Netting** benefits, regional and product issues
- What about end-users of derivatives
 - Cannot be CCP members
 - If they trade through a member what happens if that member (or their clients) default?
- Should CCPs be linked?
 - Cross-margining benefits
 - But now one CCPs failure can impact another CCP (**political risk**)
- Are CCPs too big to fail?
 - Not clear, depends on who you ask (US, Europe) – **systemic risk**

Impact of CCPs

- CCPs centralise operational and legal risks and allow multilateral netting
 - Can lead to efficiencies of scale
 - Multilateral netting may reduce systemic risk if it dominates loss in bilateral netting benefits although this seems unlikely (Duffie and Zhu)
- Loss mutualisation creates moral hazard
- Increase **funding liquidity risk**
 - From significant initial margin and CCP capital requirements
- Increase in **systemic risk**
 - Multilateral netting potentially increases exposure in multi-CCP world
 - CCPs may increase margin requirements in volatile markets

Basis for Optimisation

- Arrow denotes the ideal situation

	Overcollateralised (CCP)	Collateralised (Two-way CSA)	Uncollateralised (No CSA)
CVA			
DVA			
Funding			
Regulatory Capital			

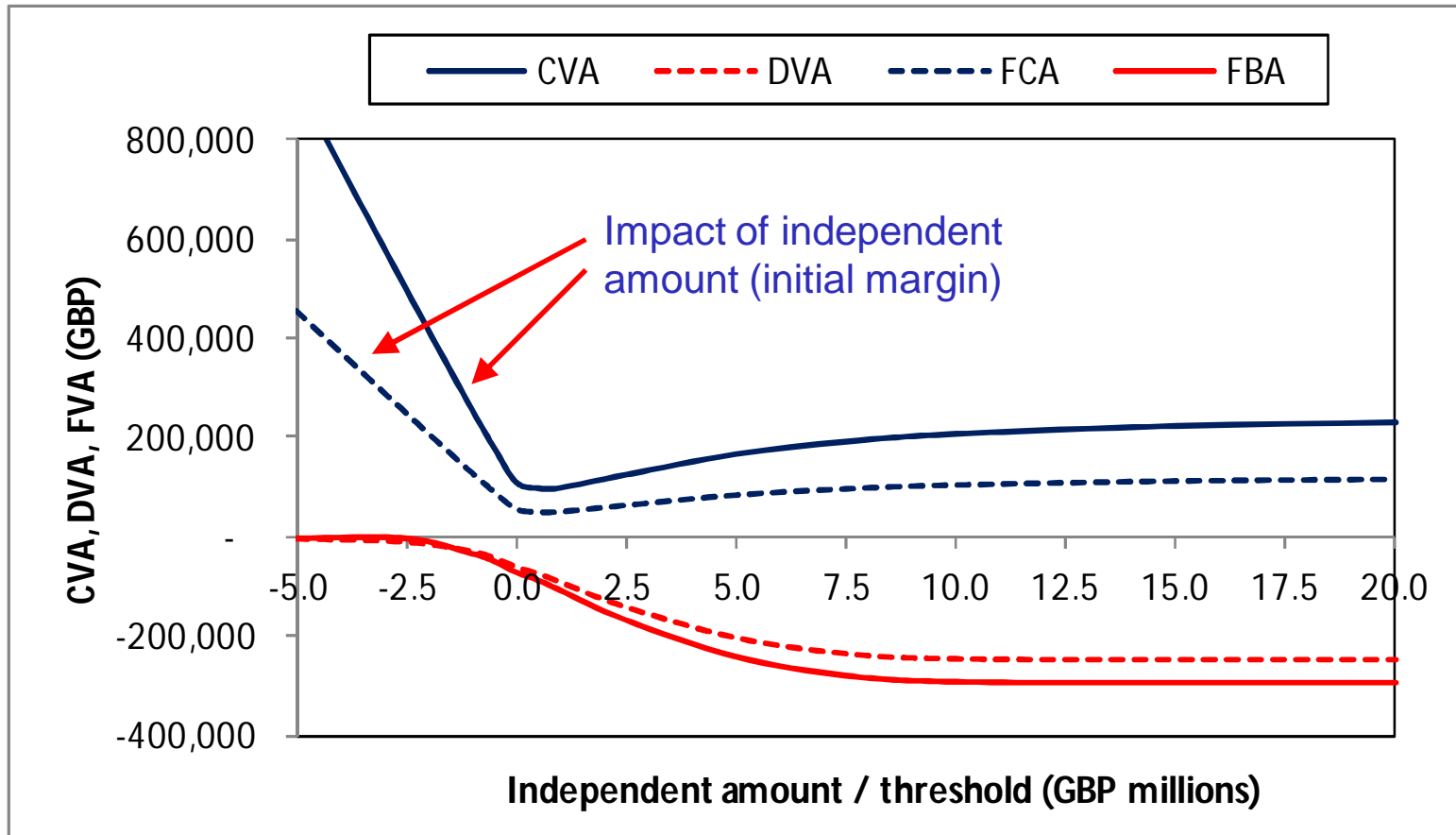
Meet the Family

“Risk-free” valuation

Value = Risk-free Value

$$- \underbrace{\text{CVA} + \text{DVA}}_{\text{Counterparty risk}} - \underbrace{\text{FCA} + \text{FBA} \pm \text{CollVA}}_{\text{Funding liquidity risk}} + \underbrace{\dots}_{\text{Other components}}$$

CVA, DVA and FVA



Overcollateralised
(CCP)

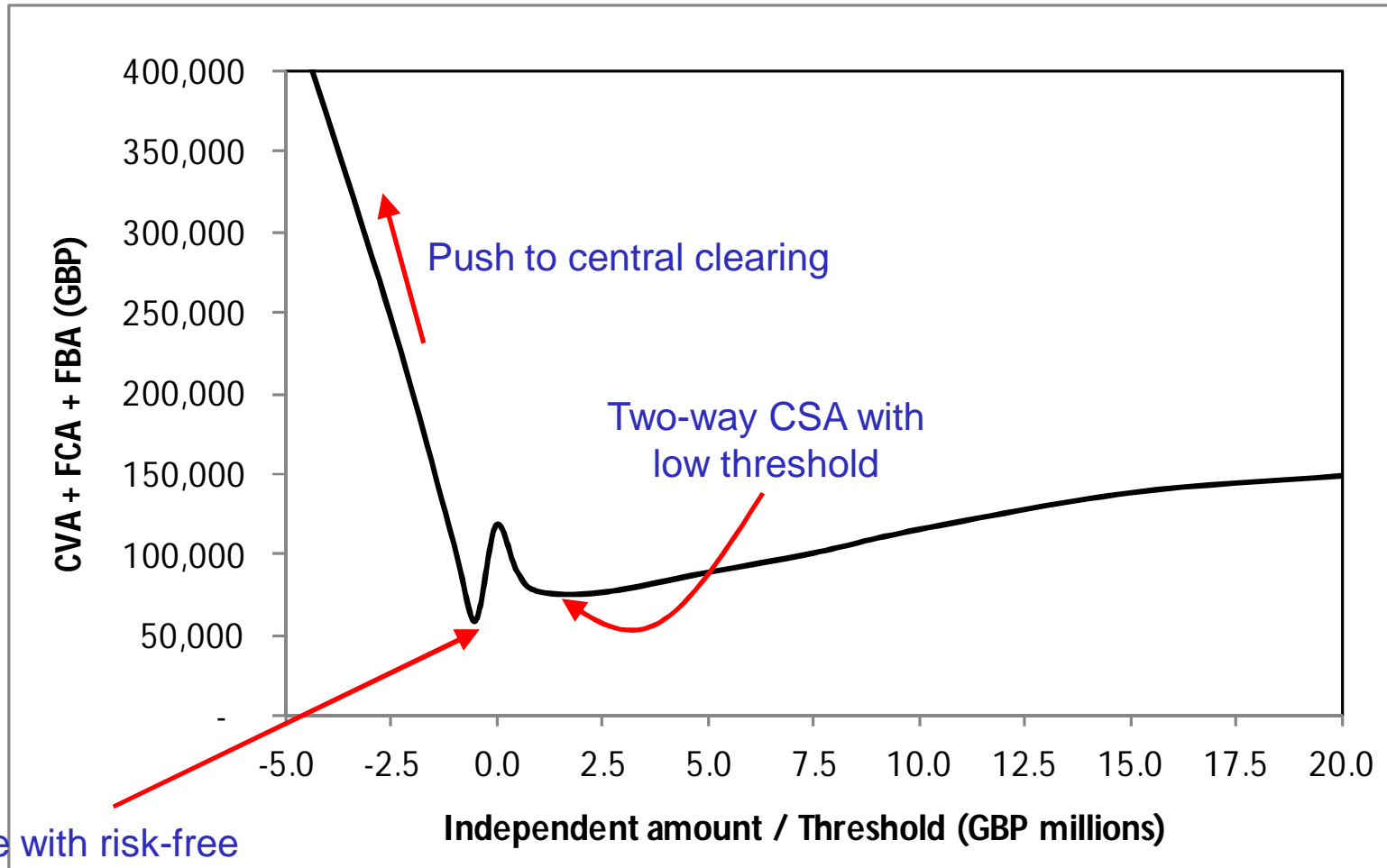
Collateralised
(Two-way CSA)

Uncollateralised
(No CSA)

Combining CVA, DVA and FVA

- Consider the combined impact of counterparty risk and funding
 - Counterparty spread = 500 bps, own spread = 250 bps, CDS bond basis = -50 bps
- What about DVA and FBA?
 - Different theoretical assumptions can allow derivation with one or the other but not both (e.g. Burgard and Kjaer) – double counting
 - We'll consider the symmetric funding + CVA (CVA + FCA + FBA)
- CVA with independent amount?
 - In theory could be large since if CCP fails lose initial margin + reserve fund contribution
 - But in reality CCPs are “risk-free” so assume no CVA with an independent amount
 - We don't therefore account for riskiness of a CCP and potential loss of reserve fund if another CCP member defaults

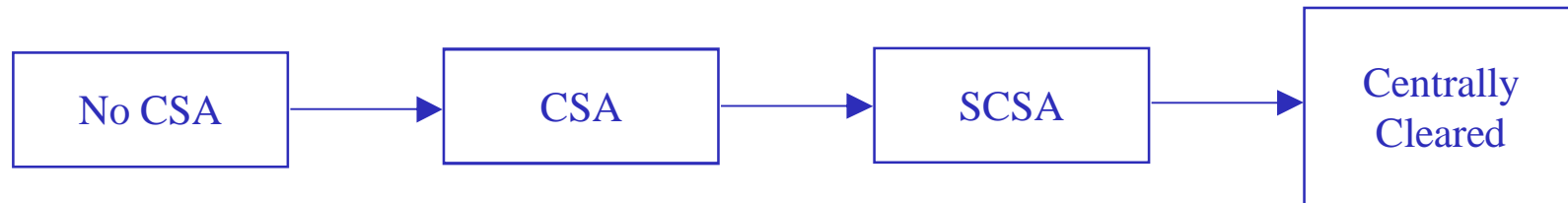
Overall Effect



Trade with risk-free
CCP but with very
small initial margin 😊

Conclusion

Reduce Counterparty Risk (but debateable how much)



Increase Funding Liquidity and Systemic Risk

- Legal risk, political risk, moral hazard may all pose greater problems