

The FVA Debate

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Papers by Hull and White Related to FVA

- ⊕ “The FVA Debate” Risk 25th anniversary issue, July 2012.
- ⊕ “The FVA Debate continued” Risk, Oct 2012.
- ⊕ “LIBOR vs. OIS: The Derivatives Discounting Dilemma”
Journal of Investment Management, 11,3 14-27
- ⊕ “Collateral vs. Credit Issues in Derivatives Pricing”
Working Paper
- ⊕ “Should a Derivatives Dealer Make a Funding Value
Adjustment” Working Paper
- ⊕ Valuing Derivatives: Funding Value Adjustment and Fair
Value”



Background

The Steps in Valuing a Portfolio of derivatives with a counterparty are

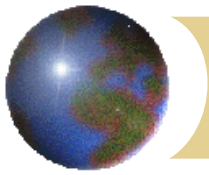
- ✿ Value the portfolio assuming that neither side will default
- ✿ Adjust for the possibility that the counterparty will default (CVA)
- ✿ Adjust for the possibility that dealer will default (DVA)

$$\text{Portfolio Value} = \text{No-default value} - \text{CVA} + \text{DVA}$$

The Key Question:

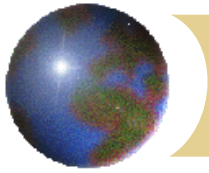
Should there be an adjustment for the dealer's funding cost so that this becomes

$$\text{Portfolio Value} = \text{No-default value} - \text{CVA} + \text{DVA} - \text{FVA}$$



The “Risk-Free” Rate

- ⊕ Academics assume that the risk-free rate should be the best estimate of a rate that is truly free of credit risk
- ⊕ Practitioners have always considered that the risk-free rate should reflect funding costs
- ⊕ Before the crisis of 2008, practitioners calculated the “risk-free” zero curve from LIBOR and LIBOR-for-fixed swap rates
- ⊕ Following the crisis dealers have switched to using the OIS rate for collateralized transactions



Theory vs. Practice

- ⊕ Many practitioners argue that the risk-free rate for non-collateralized transactions should be the bank's average funding costs
- ⊕ This explains the funding value adjustment
- ⊕ FVA can be defined as the difference between valuing a portfolio of uncollateralized transactions using the assumed "risk-free" rate and valuing it using the bank's average funding cost
- ⊕ If the trader buys or sells at the FVA-adjusted price, delta hedges, and the average funding cost applies to funds used or funds generated, the trader should break even.



FVA Flies in the Face of Finance Theory....

- ⊕ The discount rate for a company's investment opportunity should reflect the risk of the investment's cash flow, not the company's average funding costs
- ⊕ Using the same funding cost for all projects will lead to high-risk project looking too attractive and low risk projects looking unattractive
- ⊕ In the case of derivatives we can use risk-neutral valuation to show that risk-neutral cash flows should be discounted at a risk-free rate



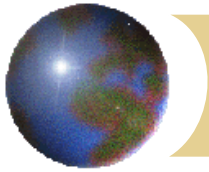
The Adjustments

- ⊕ FVA: adjustment for incremental funding costs being higher than the risk-free rate
- ⊕ CVA adjustment for counterparty credit risk
- ⊕ DVA: adjustment for own credit risk. There are two components
 - ⊕ DVA1 measures benefit of defaulting on derivative
 - ⊕ DVA2 measures benefit of defaulting on incremental funding for derivative
- ⊕ DVA1 equals counterparty's CVA and vice versa



FVA and DVA2

- ✚ FVA equals DVA2
- ✚ This means that when a bank quantifies DVA2 (as it is encouraged to do by accounting bodies), it neutralizes the excess of its funding cost over the risk-free rate
- ✚ From an overall bank accounting perspective it is therefore incorrect to require the derivatives desk to recover the bank's funding cost



FVA and DVA1

- ⊕ When a bank is only selling options to a counterparty DVA1 and FVA are both benefits to the bank and are equal to each other:
 - ⊕ $DVA1 = FVA^*$ where $FVA^* = -FVA$ is the benefit of funding
- ⊕ For other derivatives portfolios where value can become positive or negative $DVA1 > FVA^*$
- ⊕ However the incremental DVA1 can be greater than or less than the incremental FVA^* when a transaction is added to a portfolio



Unintended Consequences of FVA

- ⊕ When end users want to sell options, low-funding-cost dealers will tend to be the most competitive
- ⊕ When end users want to buy options, high-funding-cost dealers will tend to be the most competitive
- ⊕ A collateralized derivative is not a perfect hedge for an identical uncollateralized derivative
- ⊕ There are arbitrage opportunities open to end users



Conclusions

- ⊕ Banks should re-evaluate their views on FVA
- ⊕ High-funding- cost banks will find that, when they make an FVA, they are offering end users favorable (and arbitrageable) prices for some derivatives and are uncompetitive for others
- ⊕ Derivatives desks should include DVA1, not FVA, in their pricing.
- ⊕ Including FVA, but not DVA1, does not give good results
- ⊕ FVA and DVA2 are accounted for elsewhere in the bank and cancel each other out