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# Interest Rate, Foreign Currency Derivatives and Debt Valuation under SFAS 157

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# Agenda

1. FAS 157 Overview and Impact on Derivatives and Hedging

2. ILFC Experience and FAS 157 Disclosures

3. Valuation Methodology for Debt Instruments, Interest Rate and Foreign Currency Derivatives

# 1. FAS 157 Overview and Impact on Derivatives and Hedging

# Introduction

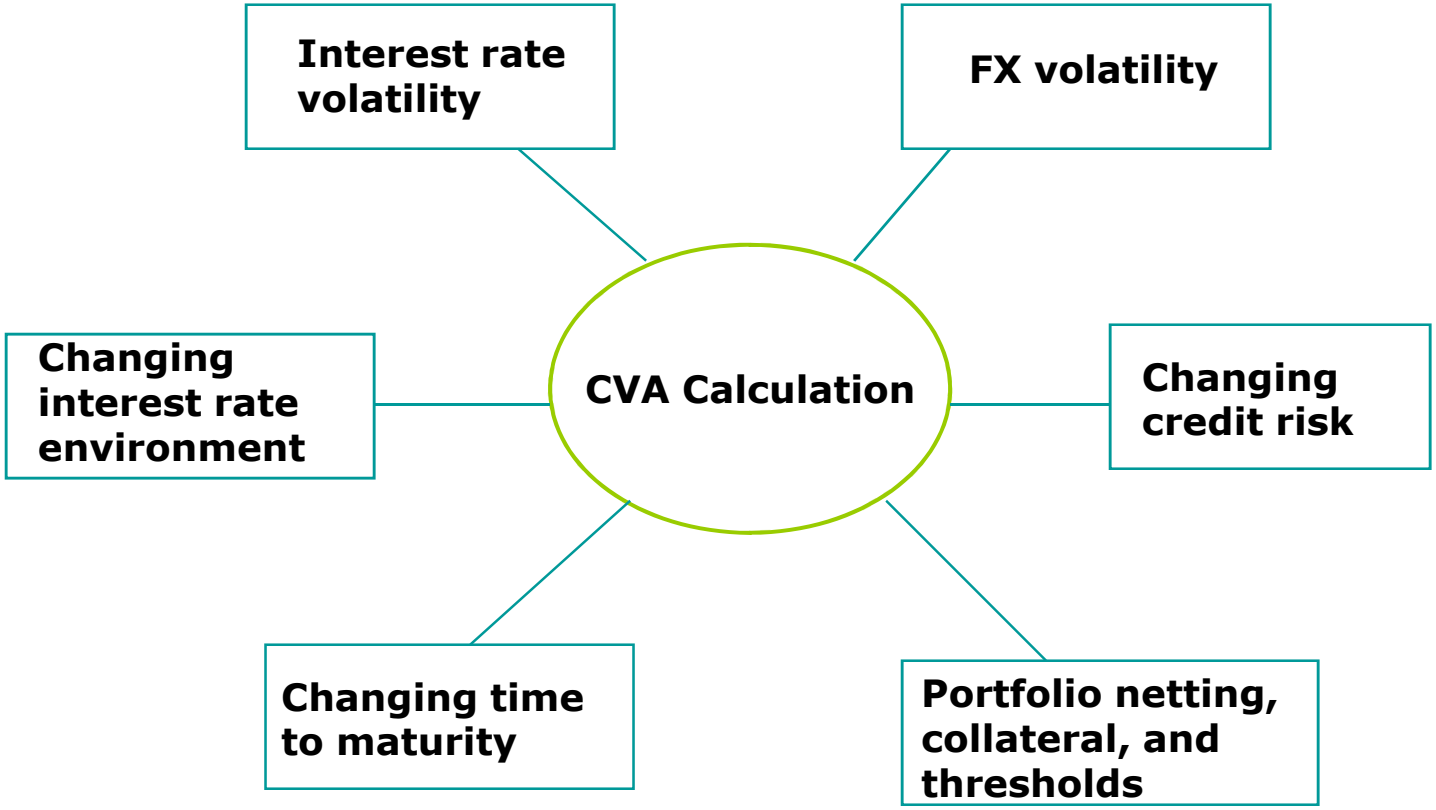
- FAS 157 changed prior definitions of fair value
  - Prior to FAS 157, there were different definitions of fair value and limited guidance for applying those definitions in practice
  - Under FAS 157, fair value is defined as follows:
    - The price that would be received to **sell an asset**
    - The price that would be paid to **transfer a liability** to another party with **similar credit risk** – the liability is assumed **to continue, not to be settled**
    - Focus is on the "exit price"…..not the "entry price"
    - Considered from the perspective of a market participant that holds the asset or owes the liability
    - Transaction deemed to occur in the principal or most advantageous market
    - Consideration of **non-performance risk** must now be incorporated

# Overview (cont.)

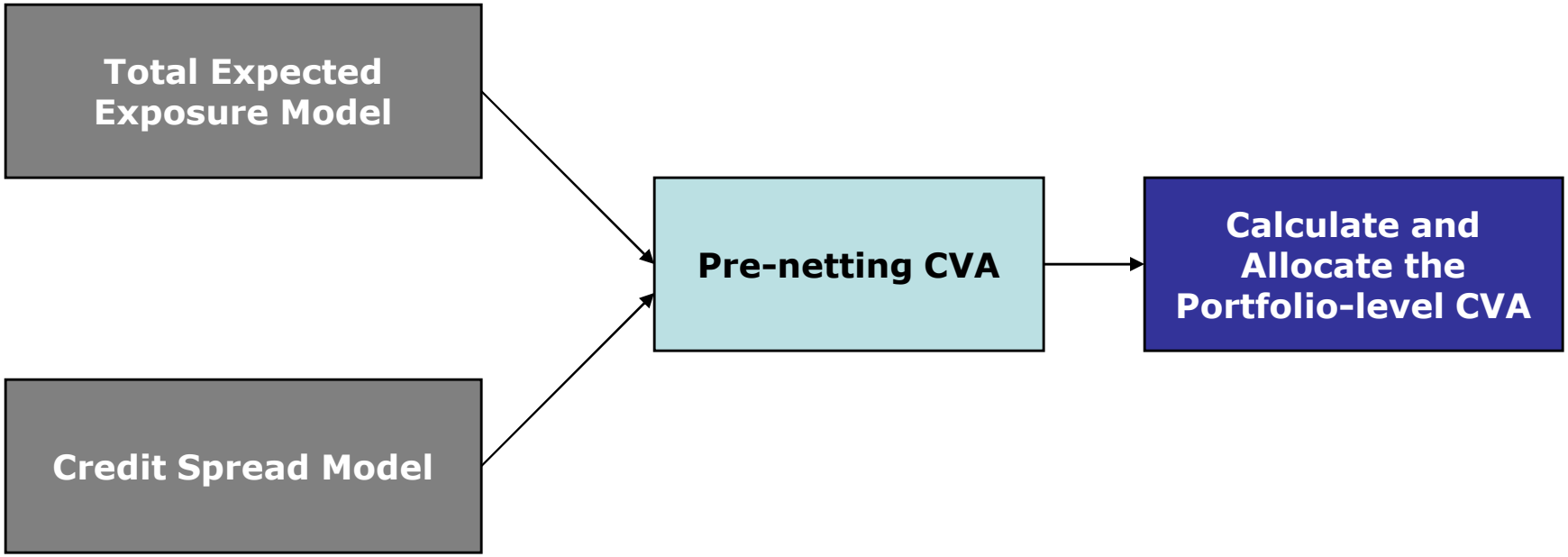
- **FAS 157 defines *fair value* and provides a consistent framework for measuring fair value (it does not cause any new instruments to be recognized at *fair value*) that contemplates and incorporates non-performance risk**
  - Credit models need to incorporate a variety of factors to properly assess the credit risk related to derivative contracts, including:
    - Master netting arrangements
    - Collateral and/or other credit enhancements, such as guarantees
    - Threshold amounts, mandatory cash settlement dates, & mutual puts
    - Term structure of credit now considered
  - Different types of derivative products require different models
  - In addition, the following factors also affect the credit calculations:
    - Changes in the level of interest rates
    - Changes in time remaining to maturity
    - Changes in interest rate volatility
    - Changes in credit risk (credit sector and entity-specific)

# Fair Value – Factors to Consider

- Implementing FAS 157 for derivatives can be a very complicated process and undertaking



# Methodology for Calculating FAS 157 for Derivatives




- These steps adjust the termination (or settlement) value by an appropriate credit valuation adjustment (CVA) to arrive at a FAS 157-compliant valuation. The CVA is the dollar amount of the adjustment related to non-performance risk.

# Classification Levels within the Fair Value Hierarchy for Derivatives

- FAS 157 established a framework for fair value calculations
- FAS 157 outlined a prioritization of the inputs to the valuations
- Highest priority to quoted prices (unadjusted) in active markets for identical assets or liabilities (Level 1) and the lowest priority to unobservable inputs (Level 3)….
- …The level in the fair value hierarchy within which the fair value measurement in its entirety falls shall be determined based on the lowest level input that is significant to the fair value measurement in its entirety

# Assessing Significance of CVAs

- To determine whether CVAs are significant to the overall portfolio valuation, entities could consider several different measures:
  - CVA as a percentage of termination value
  - CVA in terms of basis points (for swaps)
  - CVA in terms of vega (for options)
  - CVA as a percentage of notional
  - Overall materiality of derivatives and CVAs to the financial statements

- Each measure has its limitations, but our preferred method is CVA in terms of basis points (or vega for options)

# Tension Between FAS 157 and FAS 133/IAS 39

- **The impact on hedge accounting (specifically effectiveness testing and measurement of ineffectiveness) has introduced some unique challenges and considerations**
- **Complexities involve the tension between the unit of valuation (FAS 157) vs. the unit of account (FAS 133/IAS 39)**
  - Assuming a master netting arrangement is in place, CVAs are appropriately calculated at the counterparty portfolio level, whereas hedge accounting generally is applied at the individual derivative level
  - What do we mean by counterparty portfolio?

| Portfolio | Company | Counterparty | # of Derivatives |
|---|---|---|---|
| 1 | Company A | Bank 1 | 3 |
| 2 | Company A | Bank 2 | 1 |
| 3 | Company A | Bank 3 | 2 |

- **When allocation of the CVA is considered necessary for effectiveness assessments, various approaches may be followed, provided the selected approach is reasonable and consistently applied (Chatham prefers the "relative credit adjustment approach")**

# Impact on Hedge Effectiveness Tests

- Assessing significance of CVAs impacts how effectiveness assessments are performed and the types of disclosures that are required
- The SEC staff has indicated that, in certain circumstances, a qualitative analysis may be sufficient in determining that the impact of the CVAs will not cause the associated hedging relationships to fail their periodic assessments of hedge effectiveness. A qualitative determination should take into account:
  - The magnitude of the CVAs in relation to the overall portfolio valuation
  - The degree of effectiveness of existing hedge relationships
- In many cases, the conclusion of performing the qualitative analysis is to exclude the CVA from the assessment of effectiveness because the two criteria are met
- This is particularly useful in instances when regression is used as the assessment method

# Assessing Significance of CVAs - Example

| | Aggregated Valuation Data | | | | Indicators of Significance | |
|---|---|---|---|---|---|---|
| Portfolio | Aggregate DV01 | Aggregate Termination Value | CVA | FAS 157 Fair Value | CVA in bps (CVA / DV01) | CVA as a % of Termination Value |
| 1 | 118,199 | (1,413,921) | 379,299 | (1,034,622) | **3.2** | -26.8% |
| 2 | 12,181 | (2,224,350) | 169,822 | (2,054,528) | 13.9 | -7.6% |
| 3 | 17,578 | (2,394,492) | 38,326 | (2,356,166) | **2.2** | **-1.6%** |
| 4 | 69,736 | (10,254,574) | 1,498,974 | (8,755,600) | 21.5 | -14.6% |
| 5 | 110,185 | (14,968,594) | 143,600 | (14,824,994) | **1.3** | **-1.0%** |

- **Assessing significance is a matter of judgment. In practice, there is generally a good sense for the impact that changes in interest rates (or foreign exchange rates) can have on the value and changes in value of a derivative. However, the same comfort level or "sense" for the materiality of the CVA may not exist because it is still a new concept.**

# Impact on Cash Flow Hedges

- Impact on cash flow hedges: Changes in the derivative CVA do not automatically impact assessments of hedge effectiveness and measurements of ineffectiveness, UNLESS
  1. it is no longer probable that the counterparty will not default, or
  2. hedge ineffectiveness is measured under the Change in Fair Value Method

- Accordingly, for other methods of measuring ineffectiveness for cash flow hedges:
  - Change in Variable Cash Flows: Changes in the derivative CVA are recognized in OCI and have no impact on earnings (result in no hedge ineffectiveness)
  - Hypothetical Derivative Method: Changes in the derivative CVA are generally recognized in OCI and have no impact on earnings (result in no hedge ineffectiveness)
    - However, if the actual derivative starts off-market at the inception of the hedging relationship, there are currently differing viewpoints regarding whether changes in the CVA(s) should impact hedge ineffectiveness

# Cash Flow Hedge Illustration – Hypothetical Derivative

- **Interest rate swap designated as a cash flow hedge on trade date**
- **Repricing date mismatch**

| Derivative | Fair Value at Inception | Clean Price (excluding CVA) on Measurement Date | CVA on Measurement Date | FAS 157 Fair Value on Measurement Date |
|---|---|---|---|---|
| Actual | $0 | ($3,700,000) | $300,000 | ($3,400,000) |
| Hypothetical | $0 | ($3,500,000) | $300,000 | ($3,200,000) |

**Pre-FAS 157 results:**

Derivative balance: ($3,700,000)

OCI balance: $3,500,000

Cumulative ineffectiveness: **$200,000** (loss)

**FAS 157 results:**

Derivative balance: ($3,400,000)

OCI balance: $3,200,000

Cumulative ineffectiveness: **$200,000** (loss)

# Impact on Fair Value Hedges

- Changes in the derivative CVA results in hedge ineffectiveness and will immediately impact earnings

- Note that the hedged item generally has no offsetting adjustment for credit risk (for hedges of interest rate risk only) or vastly different credit risk adjustments (for hedges of overall changes in fair value)
  - Swap is recorded on balance sheet at full fair value – FAS 157 fair value
  - Hedged item is recorded on balance sheet at a fair value that is based on changes in the hedged risk (e.g. interest rate risk only) – FAS 133/IAS 39 fair value

- Effectiveness assessments will also be impacted, absent a qualitative determination (discussed previously) that the CVA will not cause the hedging relationships to fail

- Example: The following slide shows the ineffectiveness of a fair value hedge of $40 million of 5.375% callable debt due to mature March 2018. Changes in the debt's fair value in each case are calculated based on changes in interest rates only. Changes in the swap's fair value are first calculated excluding the impact of the CVA (termination value) and then including the impact of the CVA

# Impact on Fair Value Hedges (cont.)

Excluding CVA

| Period End | CVA Change | Swap Change (Pre-157) | Debt Change | Ineffectiveness |
|---|---|---|---|---|
| **4Q07** | **-** | **1,013,743** | **(1,001,751)** | **11,992** |
| **1Q08** | **-** | **653,226** | **(645,458)** | **7,768** |
| **2Q08** | **-** | **(748,520)** | **790,890** | **42,370** |
| **3Q08** | **-** | **54,941** | **39,822** | **94,763** |
| **4Q08** | **-** | **851,836** | **(1,018,673)** | **(166,837)** |
| Cumulative | - | 1,825,226 | (1,835,170) | (9,944) |

Including CVA

| Period End | CVA Change | Swap Change (FAS 157) | Debt Change | Ineffectiveness |
|---|---|---|---|---|
| **4Q07** | **200,627** | **1,214,370** | **(1,001,751)** | **212,619** |
| **1Q08** | **63,755** | **716,981** | **(645,458)** | **71,523** |
| **2Q08** | **89,520** | **(659,000)** | **790,890** | **131,890** |
| **3Q08** | **(15,278)** | **39,663** | **39,822** | **79,485** |
| **4Q08** | **(430,351)** | **421,485** | **(1,018,673)** | **(597,188)** |
| Cumulative | (91,727) | 1,733,499 | (1,835,170) | (101,671) |

| Difference |
|---|
| **200,627** |
| **63,755** |
| **89,520** |
| **(15,278)** |
| **(430,351)** |
| (91,727) |

- **The difference in the ineffectiveness when the CVA is included can be significant**

# 2. ILFC Experience and FAS 157 Disclosures

# Overview – ILFC

- ILFC owns 992 aircraft and leases them out to airlines around the world.
- ILFC has financed aircraft purchases through private and public debt
- ILFC has not chosen to FV debt under SFAS 159
- Hedge strategies

# Derivatives

- ILFC uses derivatives only to mitigate risk
- Risks hedged are
  - Foreign Currency Risk
  - Interest Rate Risk
- We use
  - cross currency swaps and forwards
  - Interest rate swaps and caps

# Foreign Currency & Interest Rate Risk

Foreign Currency Risk

- ILFC has a Euro shelf and hedges its foreign currency exposure on its foreign currency denominated debt. At June 30, 2009 we had €1.6 billion and £300 million outstanding.
- ILFC denominates some leases in Euros and partially hedges the foreign currency risk.

Interest Rate Risk

- ILFC issues floating rate debt and has hedged its interest rate risk through interest rate swaps

# ILFC Portfolio Overview

- Total Debt at June 30, 2009 was $31.7 billion.
- Total Notional value of derivatives was
  - A total of $1.1 billion liability positions of interest rate swaps
  - €1.6 billion asset positions of cross-currency swaps
  - £300 million asset position of cross-currency swap

# Adoption of SFAS 157 on January 1, 2008

- All our derivatives were designated cash flow hedges
- Needed to incorporate CVA and MVA
  - Level 2 valuation
  - Used CDS spreads to incorporate counter party risk
- Accounting for CVA and MVA
  - Flow through P/L
  - Correction in third quarter to OCI
  - Master Netting Agreement

# Disclosures

| | Level 1 | Level 2 | Level 3 | Counterparty Netting (a) | Total |
|---|---|---|---|---|---|
| | | | (Dollars in thousands) | | |
| March 31, 2009: | | | | | |
| Derivative assets | $ - | $ 99,384(b) | $ - | $ (87,903) | $ 11,481 |
| Derivative liabilities | - | (87,903) | - | 87,903 | - |
| Total derivative assets, net | $ - | $ 11,481 | $ - | $ - | $ 11,481 |
| December 31, 2008: | | | | | |
| Derivative assets | $ - | $ 192,568(b) | $ - | $ (104,365) | $ 88,203 |
| Derivative liabilities | - | (104,365) | - | 104,365 | - |
| Total derivative assets, net | $ - | $ 88,203 | $ - | $ - | $ 88,203 |

(a) As permitted under FASB Interpretation No. 39, "*Offsetting Amounts Related to Certain Contracts,*" we have elected to offset derivative assets and derivative liabilities under our master netting agreement.

(b) The balance includes credit valuation adjustment ("CVA") and market valuation adjustment ("MVA") of $17.6 million and $19.8 million at March 31, 2009 and December 31, 2008, respectively.

# Disclosures

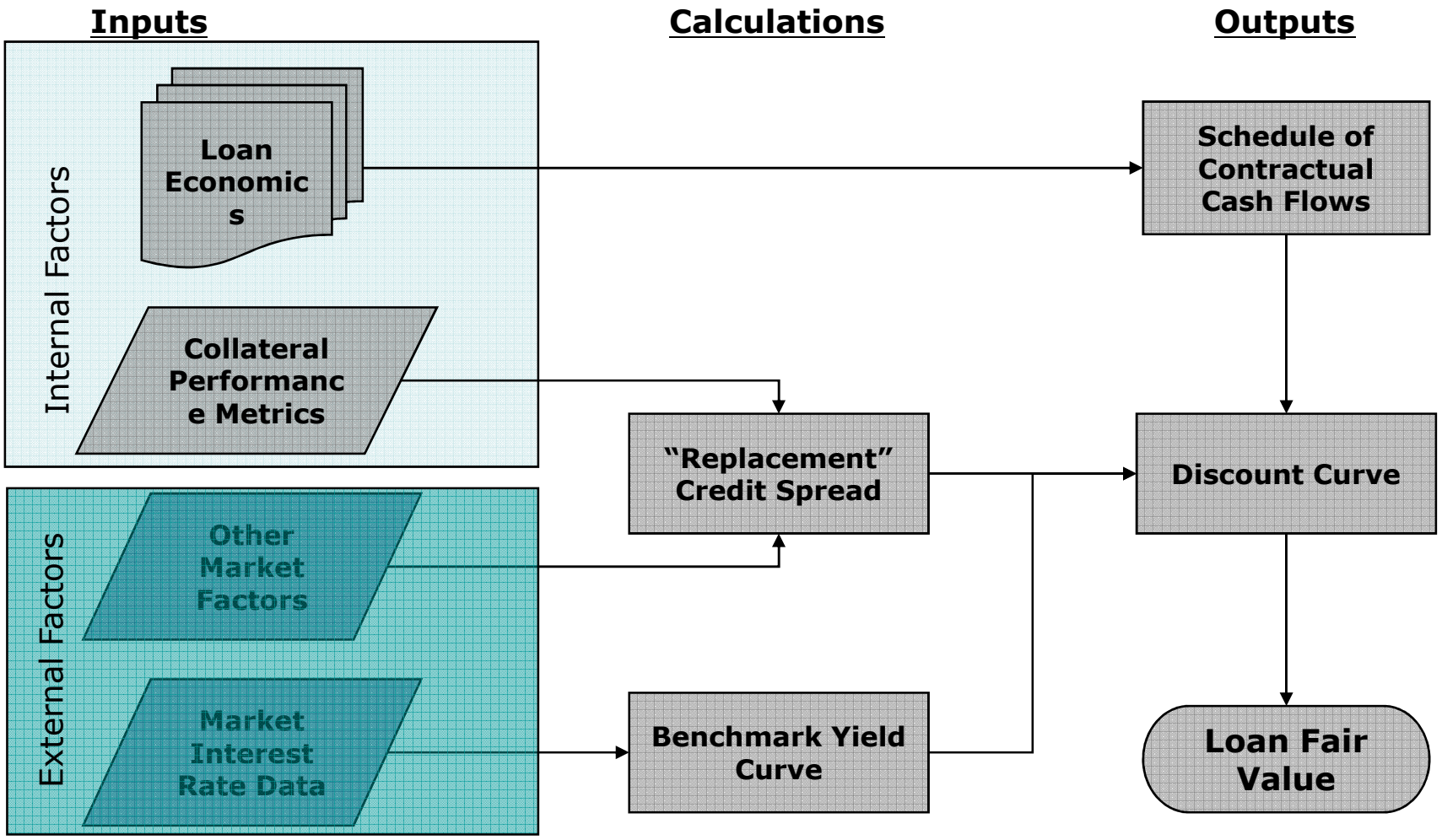
- Valuation Model Observable Inputs
  - Contractual terms
  - Interest rates curves
  - Foreign exchange rate curves
  - Yield curves and credit curves
  - Volatility and correlations of inputs
- Level 2 valuation

# 3. Valuation Methodology for Debt Instruments, IR and FX Derivatives

# When is FAS 157 Applicable for Debt

- FAS 107 required disclosure of fair values for most financial instruments, including debt and loan agreements
- FAS 159 Fair Value Option: If election is made for balance sheet recognition and measurement at fair value
- FAS 141 Business combinations, for liabilities assumed where measurement objective is specified as “fair value”

# The Debt Valuation Process

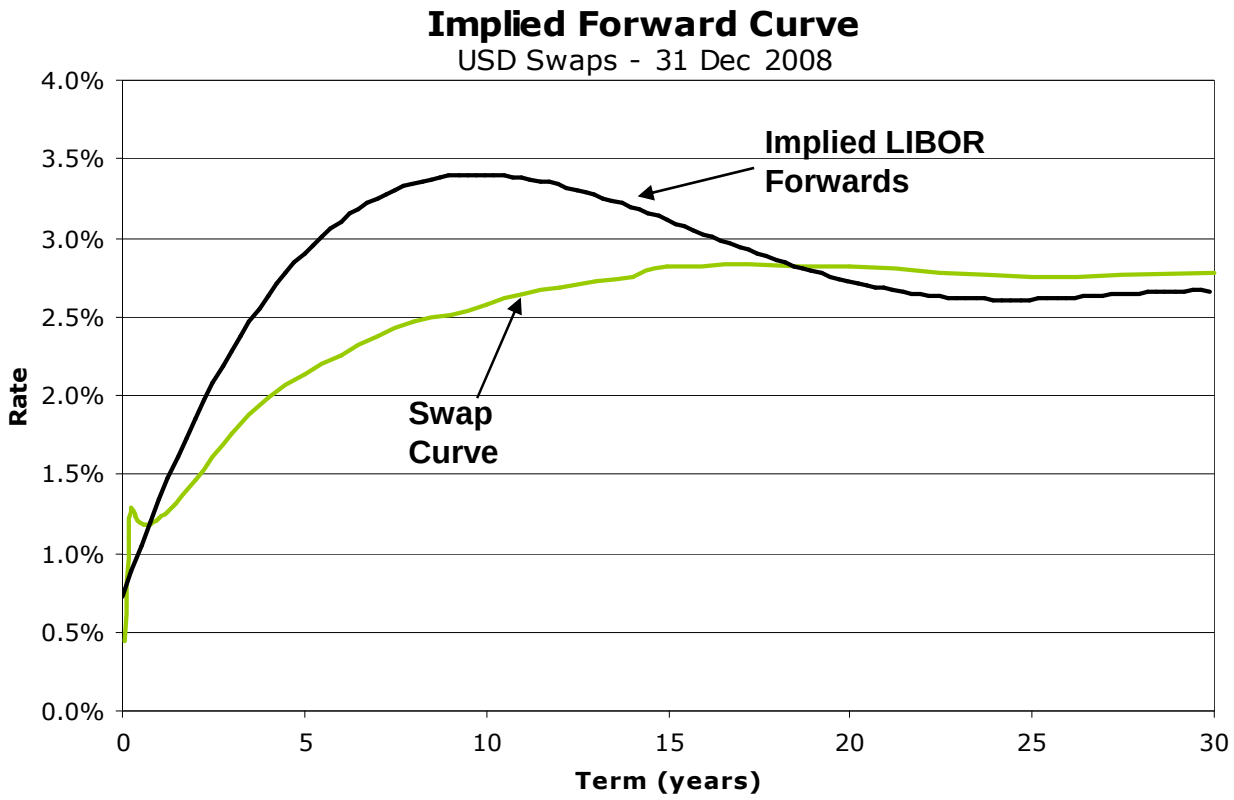


# Review of Key Fixed Income Concepts

- Interest Rate Curves –
  - ***Benchmark Yield Curve*** – made up of active market securities (bonds) which show yields for different maturities. These are used to generate pricing curves.
  - ***Discount Curve –*** derived from the yield curve, it shows the present value on a percentage basis for cash flows made in the future. This curve is normally adjusted to reflect the credit risk of the borrower.
  - ***Implied Forward Curve –*** for floating indices, it is where the yield curve "implies" the index will reset for dates in the future. Not typically adjusted for credit.

# Implied LIBOR Forward Curve

- Swap curve is effectively a running average of the implied forwards
- Small changes in the swap curve result in large changes in the forwards



# Determining Replacement Credit Spreads

Common Practices

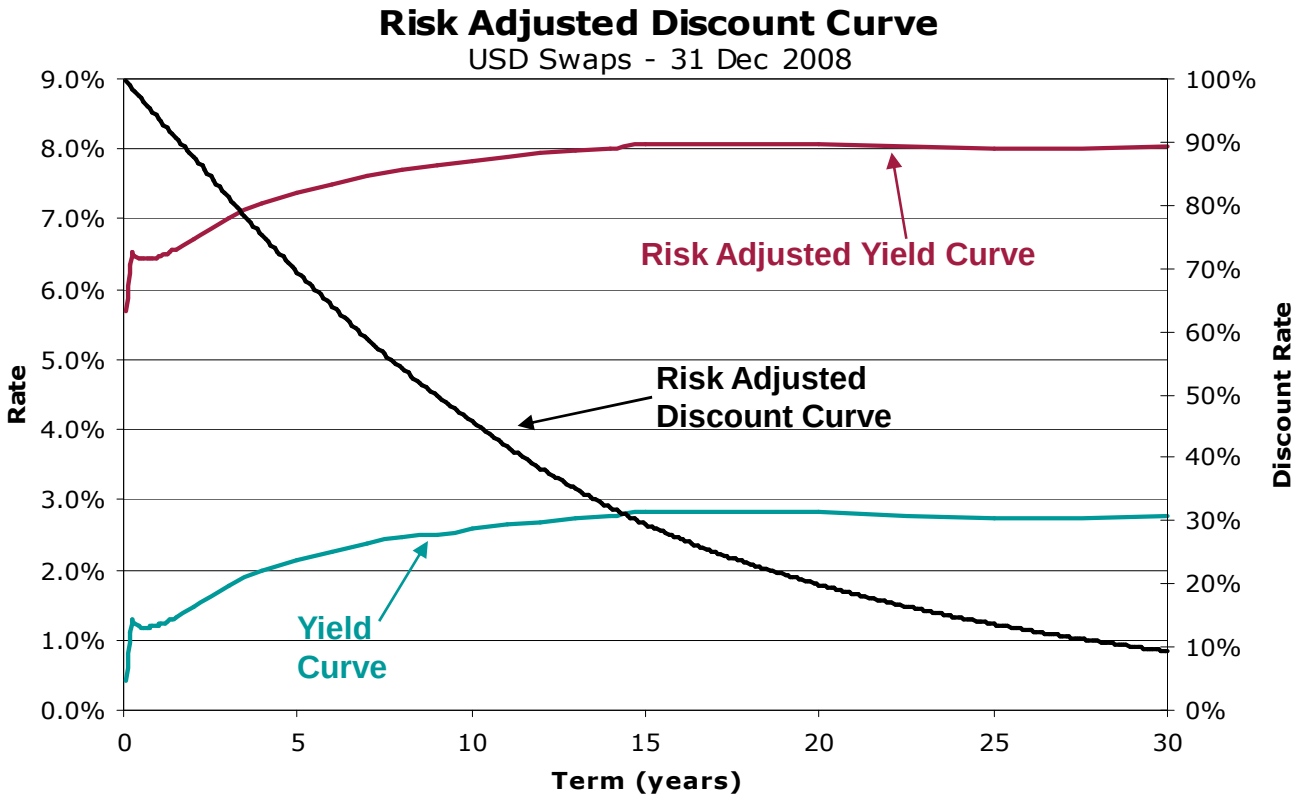
- Categorization
- Market Quotes
- Internal Data
- Sensitivity

**Continuum of Credit Spread Precision**

| Company-wide credit assumption | Complete credit analysis for each loan |
|---|---|

# Risk-Adjusted Discount Curve

- Current borrower credit applied to the market yield curve
- Risk adjusted discount factors calculated from the adjusted yield curve



# Sample Loan Valuation

- Floating Rate Loan
- Floating rate  = 1 month LIBOR plus 87.5 basis points
- Outstanding balance = $65 million
- Interest only
- Maturing 1 November 2010.
- Replacement borrowing spread  = 350 bps

# Sample Loan Valuation (cont.)

| Start Date | End Date | Reset Date | Payment Date | Floating Rate | Principal Balance | Principal Payment | Interest Payment | Disc. Factor | Total Payment PV |
|---|---|---|---|---|---|---|---|---|---|
| 12/1/08 | 1/2/09 | 11/27/08 | 1/2/09 | 2.775% | 65,000,000 | - | 160,333 | 1.000 | 160,333 |
| 1/2/09 | 2/2/09 | 12/30/08 | 2/2/09 | 1.323% | 65,000,000 | - | 74,023 | 0.997 | 73,773 |
| 2/2/09 | 3/2/09 | 1/29/09 | 3/2/09 | 2.281% | 65,000,000 | - | 115,334 | 0.993 | 114,470 |
| 3/2/09 | 4/1/09 | 2/26/09 | 4/1/09 | 2.282% | 65,000,000 | - | 123,583 | 0.988 | 122,139 |
| 4/1/09 | 5/1/09 | 3/30/09 | 5/1/09 | 1.750% | 65,000,000 | - | 94,807 | 0.985 | 93,346 |
| 5/1/09 | 6/1/09 | 4/29/09 | 6/1/09 | 1.698% | 65,000,000 | - | 95,013 | 0.981 | 93,187 |
| 6/1/09 | 7/1/09 | 5/28/09 | 7/1/09 | 1.723% | 65,000,000 | - | 93,312 | 0.977 | 91,174 |
| 7/1/09 | 8/3/09 | 6/29/09 | 8/3/09 | 1.763% | 65,000,000 | - | 105,018 | 0.973 | 102,187 |
| 8/3/09 | 9/1/09 | 7/30/09 | 9/1/09 | 1.767% | 65,000,000 | - | 92,546 | 0.970 | 89,724 |
| 9/1/09 | 10/1/09 | 8/27/09 | 10/1/09 | 1.814% | 65,000,000 | - | 98,260 | 0.966 | 94,902 |
| 10/1/09 | 11/2/09 | 9/29/09 | 11/2/09 | 1.884% | 65,000,000 | - | 108,882 | 0.962 | 104,731 |
| 11/2/09 | 12/1/09 | 10/29/09 | 12/1/09 | 1.892% | 65,000,000 | - | 99,081 | 0.958 | 94,952 |
| 12/1/09 | 1/4/10 | 11/27/09 | 1/4/10 | 1.956% | 65,000,000 | - | 120,085 | 0.954 | 114,576 |
| 1/4/10 | 2/1/10 | 12/30/09 | 2/1/10 | 2.043% | 65,000,000 | - | 103,269 | 0.951 | 98,171 |
| 2/1/10 | 3/1/10 | 1/28/10 | 3/1/10 | 2.052% | 65,000,000 | - | 103,736 | 0.947 | 98,256 |
| 3/1/10 | 4/1/10 | 2/25/10 | 4/1/10 | 2.092% | 65,000,000 | - | 117,110 | 0.943 | 110,472 |
| 4/1/10 | 5/3/10 | 3/30/10 | 5/3/10 | 2.154% | 65,000,000 | - | 124,473 | 0.939 | 116,921 |
| 5/3/10 | 6/1/10 | 4/29/10 | 6/1/10 | 2.162% | 65,000,000 | - | 113,199 | 0.936 | 105,925 |
| 6/1/10 | 7/1/10 | 5/27/10 | 7/1/10 | 2.239% | 65,000,000 | - | 121,281 | 0.932 | 113,033 |
| 7/1/10 | 8/2/10 | 6/29/10 | 8/2/10 | 2.346% | 65,000,000 | - | 135,553 | 0.928 | 125,745 |
| 8/2/10 | 9/1/10 | 7/29/10 | 9/1/10 | 2.395% | 65,000,000 | - | 129,721 | 0.924 | 119,801 |
| 9/1/10 | 10/1/10 | 8/27/10 | 10/1/10 | 2.436% | 65,000,000 | - | 131,943 | 0.919 | 121,306 |
| 10/1/10 | 11/1/10 | 9/29/10 | 11/1/10 | 2.484% | 65,000,000 | 65,000,000 | 139,010 | 0.915 | 59,607,651 |
| | | | | | | | | **Total PV** | **61,966,775** |

# Sample Loan Valuation (cont.)

- Since credit spreads have increased significantly since the inception of this loan, it is now valuing at a large discount.
- The discount can be considered two ways:
  - From the borrower's perspective, this is much lower than market rate, making the loan a smaller liability
  - From the lender's perspective, the certainty of these cash flows is lower because of the current market environment, making it a smaller asset.
- Valuation as of 31 December 2008 = **$61.96 million**

# Derivatives: Review of Key Concepts

- **Credit Spread**
  - Difference in yield between two similar instruments attributable to a difference in credit standing of the respective issuers of those obligations
  - May be obtained from the market (Credit Default Swap (CDS) or bond spreads), or approximated via a quantitative model (such as Moody's KmV)
- **Credit Exposure**:
  - Amount that is at risk if the counterparty defaults
  - Depends on the type of derivative transaction and collateral terms
- **Credit Valuation Adjustment (CVA)**
  - The dollar amount of the FAS 157 fair value adjustment related to non-performance (particularly credit) risk.
  - Also referred to as **credit charge**

# Total Expected Exposure

$$TEE = CE + PFE$$

- **Current Exposure**: the estimated termination (or settlement) amount, a.k.a. “MTM”
- **Potential Future Exposure**: a function of the potential changes in the underlying variable on the derivative over its remaining life
- **Total Expected Exposure:** true credit exposure on the derivative, as viewed by dealer banks and market participants

# Credit Exposure Model – IR Swap

- Total Expected Exposure (TEE):

$$PV(TEE) = \sum_{i=1}^{n} PV\{E[\max(f_i, 0)] \times YEARFRAC(i, i+1)\}$$

This is equivalent to the area under the expected exposure curve for each party. It is a function of the current exposure (current MTM) plus the potential future exposure. Exposure for the swap is two-way (bilateral).

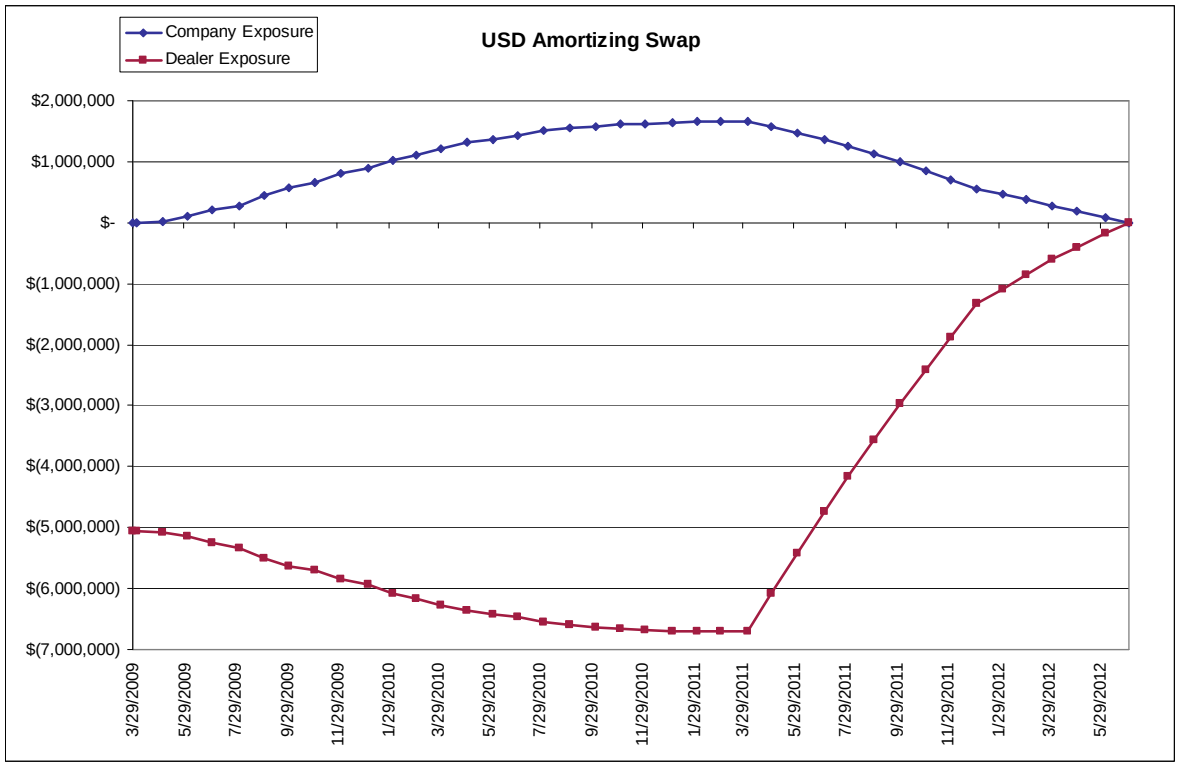
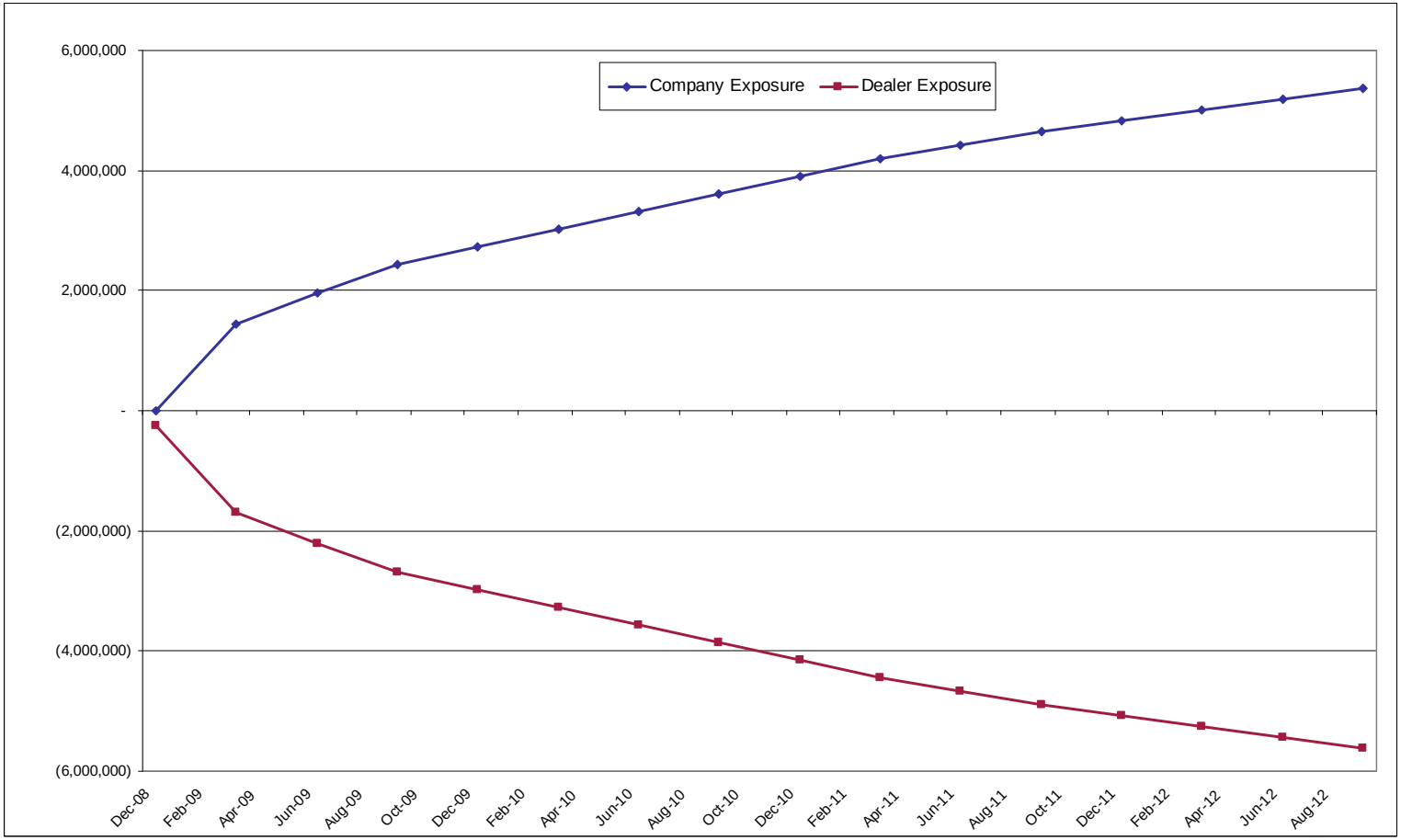


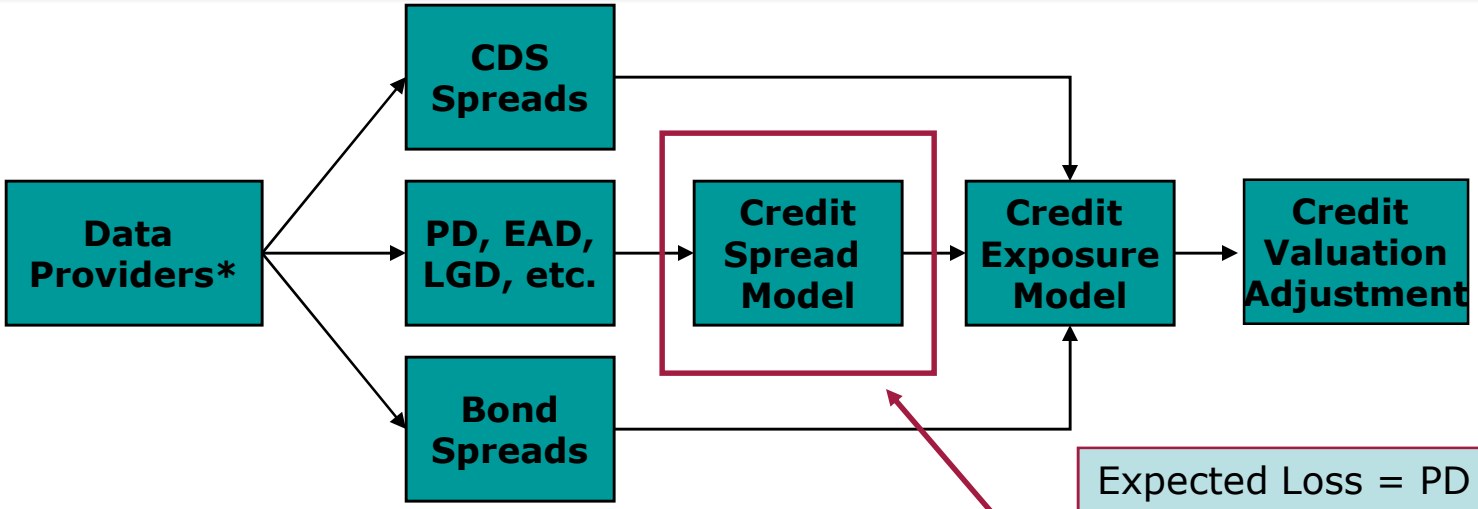

*Chart: $500mm amortizing notional swap, paying 3.33% monthly, valued at ($5.8mm) at 3/31/09*

# Credit Exposure Model – FX Forward

- $40mm Sell USD – Buy Euro FX Forward settling 9/30/12



# Process Overview




Expected Loss = PD * EAD * LGD%

Where:

| | |
|---|---|
| PD | = Probability of Default |
| EAD | = Exposure at Default |
| LGD | = Loss Given Default |
| | = (1 – Recovery Rate) |

***Moody's KMV*, *GFI-Fenics*, *Bloomberg*, *Reuters*, etc.**
**(may include entity-originated credit data and assumptions when such information is not publicly available.)**

# Example: CVA Calculation for An Interest Rate Swap

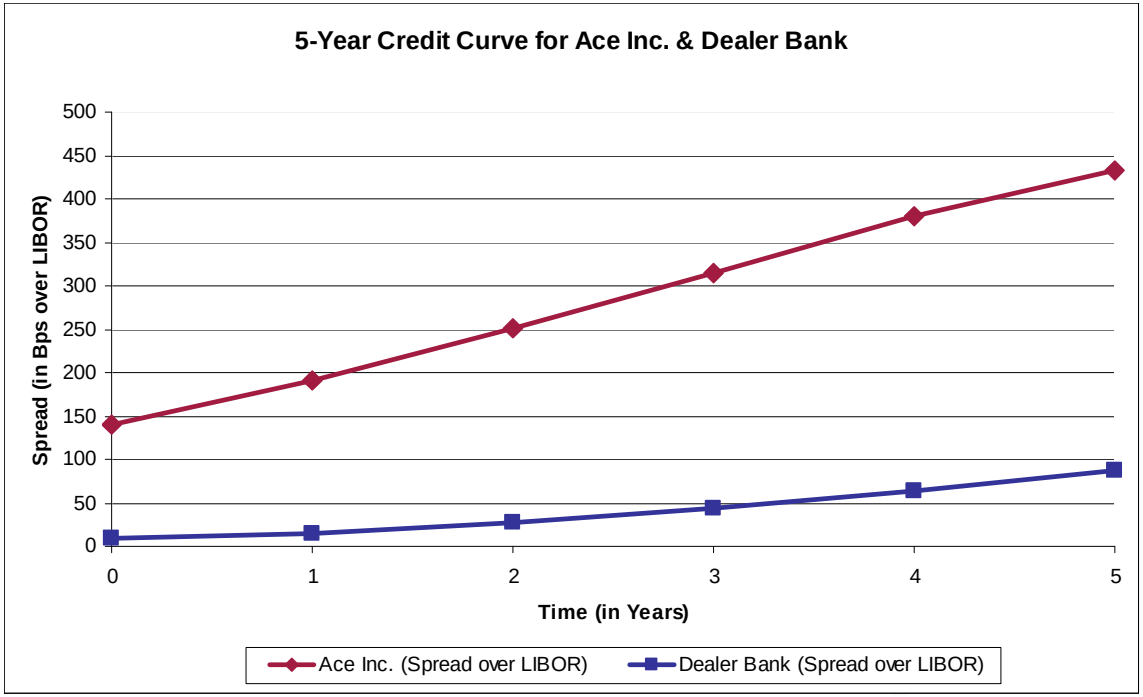
- Ace Inc. pays fixed, Dealer Bank pays floating
- Economic Terms
  - CVA calculation date: June 30, 2008
  - Trade date: June 30, 2008
  - Maturity date: June 30, 2013
  - Notional: $500 million
  - Pay-fixed Swap Rate: **4.178%**
  - Receive-floating rate index: **3-month USD-LIBOR-BBA**
  - PV01: $230,376

- Collateral Terms and Netting
  - For simplicity no credit enhancements or netting are considered in the calculations

# Example: CVA Calculation for An Interest Rate Swap

| Maturity (In Years) | Ace Inc. (Spread over LIBOR) | Dealer Bank (Spread over LIBOR) |
|---|---|---|
| 1 | 190 | 14 |
| 2 | 252 | 27 |
| 3 | 315 | 44 |
| 4 | 380 | 64 |
| 5 | 432 | 87 |

Step 1. Obtain credit curves of the two counterparties:



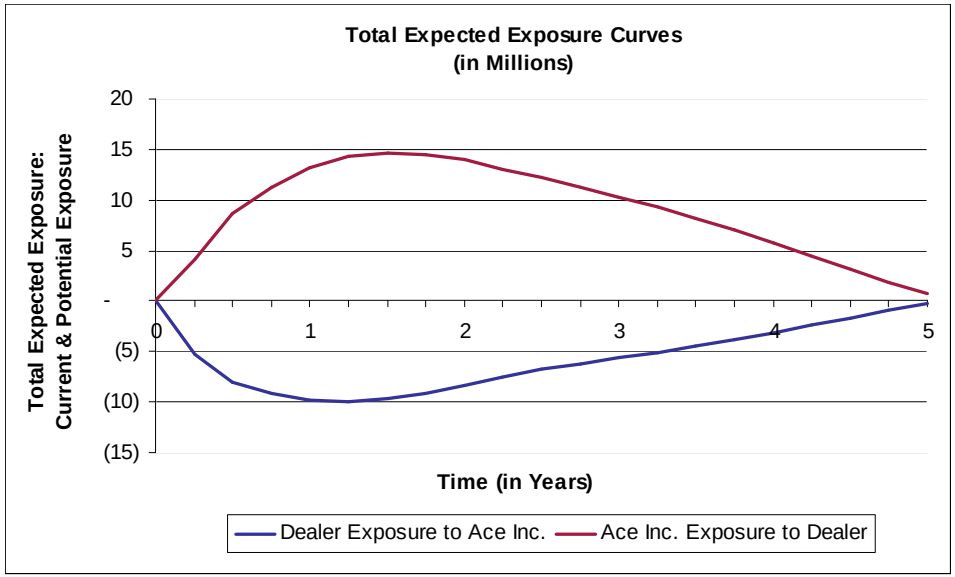
# Example: CVA Calculation for An Interest Rate Swap

Step 2. Calculate expected exposure on the remaining life of the swap transaction:

| | Average Total Expected Exposure | |
|---|---|---|
| | **Ace Inc. Exposure to Dealer** (1) | **Dealer Exposure to Ace Inc.** (2) |
| **Year 1** | (9,230,947) | 8,080,030 |
| **Year 2** | (14,383,825) | 9,317,055 |
| **Year 3** | (11,716,542) | 6,539,741 |
| **Year 4** | (7,540,206) | 4,127,910 |
| **Year 5** | (2,613,494) | 1,350,047 |
| | (45,485,014) | 29,414,783 |

(1) Ace Inc. exposure to Dealer is always shown as a negative number

(2) Dealer exposure to Ace Inc. is always shown as a positive number



# Example: CVA Calculation for An Interest Rate Swap

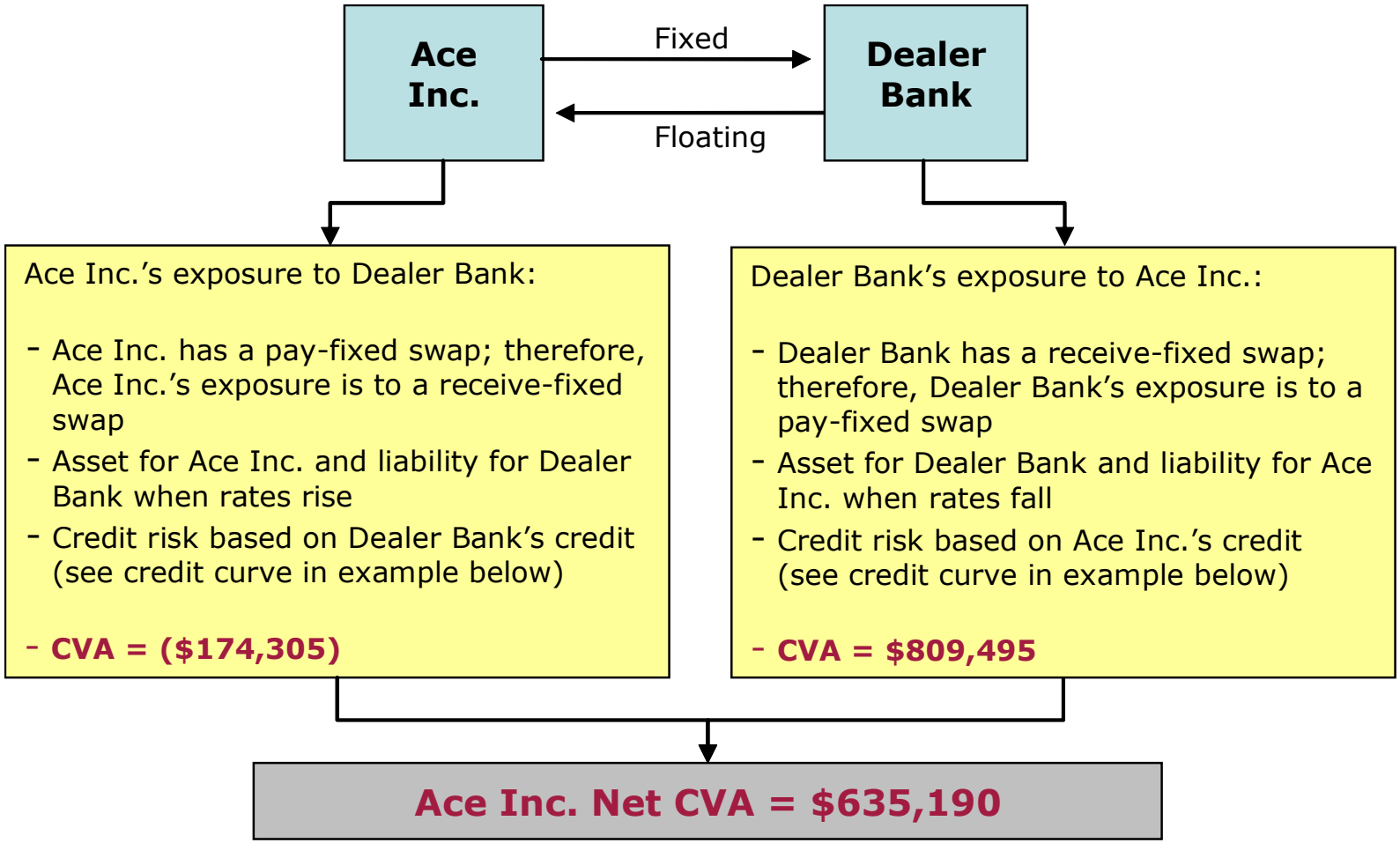
Step 3: Calculate gross credit charges and net derivative CVA

| | (A) | (B) | (C) | (D) | (A)*(C) | (B)*(D) |
|---|---|---|---|---|---|---|
| | Average Total Expected Exposure | | | | | |
| | Ace Inc. Exposure to Dealer (1) | Dealer Exposure to Ace Inc. (2) | Dealer Spread | Ace Inc. Spread | Dealer Bank Credit Charge | Ace Inc. Credit Charge |
| **Year 1** | (9,230,947) | 8,080,030 | 0.14% | 1.90% | (12,923) | 153,521 |
| **Year 2** | (14,383,825) | 9,317,055 | 0.27% | 2.52% | (38,836) | 234,790 |
| **Year 3** | (11,716,542) | 6,539,741 | 0.44% | 3.15% | (51,553) | 206,002 |
| **Year 4** | (7,540,206) | 4,127,910 | 0.64% | 3.80% | (48,257) | 156,861 |
| **Year 5** | (2,613,494) | 1,350,047 | 0.87% | 4.32% | (22,736) | 58,321 |
| | **(45,485,014)** | **29,414,783** | | | **(174,305)** | **809,495** |

**Net CVA to Ace Inc.** **635,190** (3)

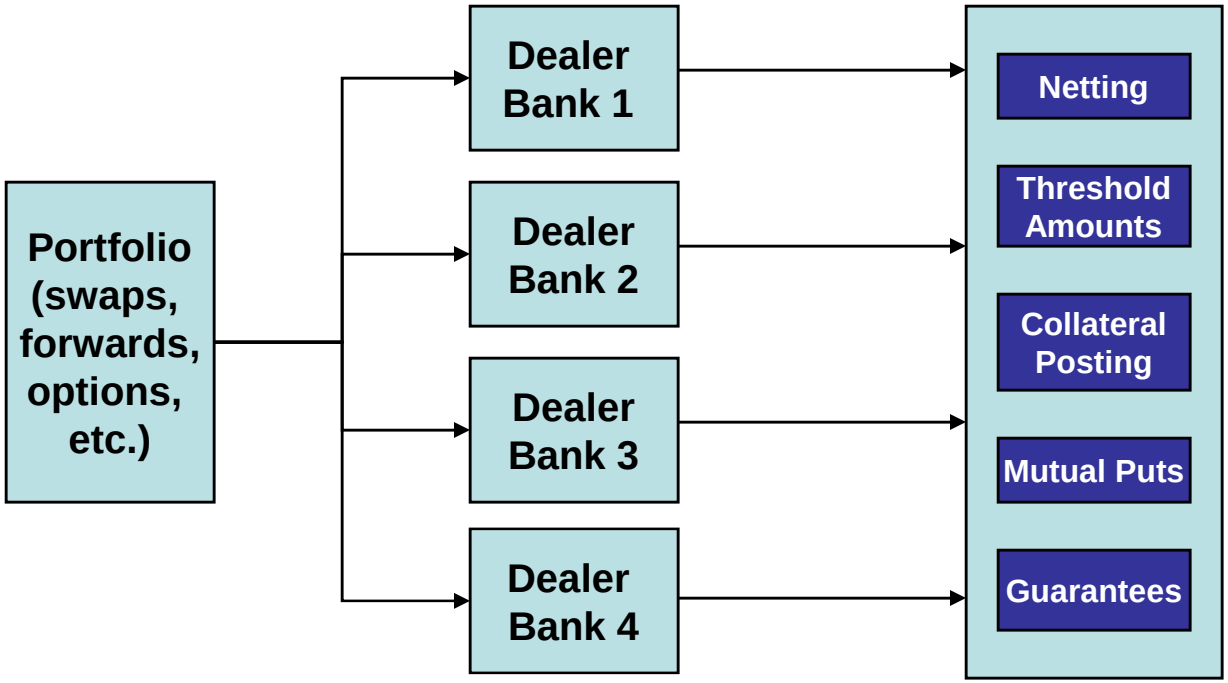
(1) Ace Inc. exposure to Dealer Bank is always shown as a negative number
(2) Dealer Bank exposure to Ace Inc. is always shown as a positive number
(3) A net positive CVA is recorded as a debit to Ace Inc.'s derivative asset/liability account, while a net negative CVA would be recorded as a credit to that account.

# Example: CVA Calculation for An Interest Rate Swap



# Calculating CVAs for a Portfolio of Derivatives

- Why calculate CVA at portfolio level?
- Unit of valuation vs. unit of account
- Consider sub-portfolios by bank counterparty



# Allocating Portfolio CVAs to Individual Derivatives

- Four methods are considered acceptable for allocating portfolio-level CVAs to individual derivative contracts:
  - Relative fair value approach
  - In-exchange or “full credit” approach
  - Relative credit adjustment approach
  - Marginal contribution approach

# Example: Allocation of Portfolio CVA

**I. Pre-Netting CVA and Weight (for individual instruments)**

| Pre-netting CVA | CVA from client's exposure to dealer | | CVA from dealer's exposure to client | | Net CVA |
|---|---|---|---|---|---|
| | Amount ($) | Weight (%) | Amount ($) | Weight (%) | |
| *Swap 1* | $ (215) | 0.62% | $ 2,595 | 1.17% | $ 2,380 |
| *Swap 2* | $ (443) | 1.27% | $ 2,855 | 1.28% | $ 2,412 |
| *Swap 3* | $ (32,674) | 93.75% | $ 212,223 | 95.34% | $ 179,549 |
| *Swap 4* | $ (1,518) | 4.36% | $ 4,925 | 2.21% | $ 3,407 |
| **Total** | **$ (34,850)** | **100.00%** | **$ 222,598** | **100.00%** | **$ 187,748** |

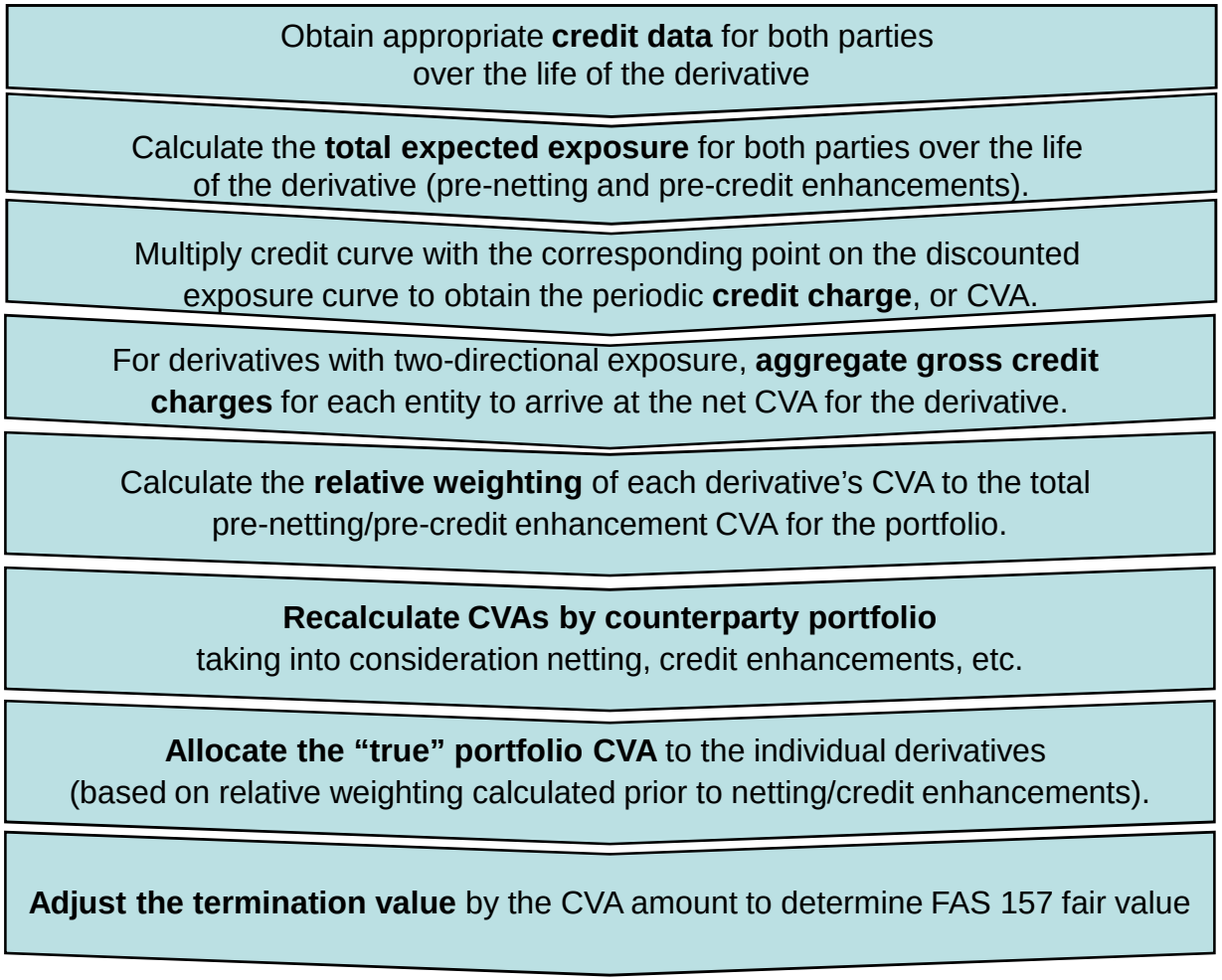
**II. Total post-netting portfolio CVA**

| Post-netting CVA | CVA from client's exposure to dealer | | CVA from dealer's exposure to client | | Net CVA |
|---|---|---|---|---|---|
| | Amount ($) | Weight (%) | Amount ($) | Weight (%) | |
| Total portfolio | **$ (14,601)** | **100%** | **$ 58,071** | **100%** | **$ 43,470** |

**III. Post-netting CVA allocation (for individual instruments)**

| Post-netting CVA | CVA from client's exposure to dealer | | CVA from dealer's exposure to client | | Net CVA |
|---|---|---|---|---|---|
| | Amount ($) | Weight (%) | Amount ($) | Weight (%) | |
| *Swap 1* | $ (90) | 0.62% | $ 677 | 1.17% | $ 587 |
| *Swap 2* | $ (186) | 1.27% | $ 745 | 1.28% | $ 559 |
| *Swap 3* | $ (13,689) | 93.75% | $ 55,364 | 95.34% | $ 41,675 |
| *Swap 4* | $ (636) | 4.36% | $ 1,285 | 2.21% | $ 649 |
| **Total** | **$ (14,601)** | **100.00%** | **$ 58,071** | **100.00%** | **$ 43,470** |

# FAS 157 For Derivatives: Recap



# Q&A

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