

Bank of Japan Workshop - Credit Value Adjustment Trends

14th June 2010

Senior Director

Theodoros Stampoulis

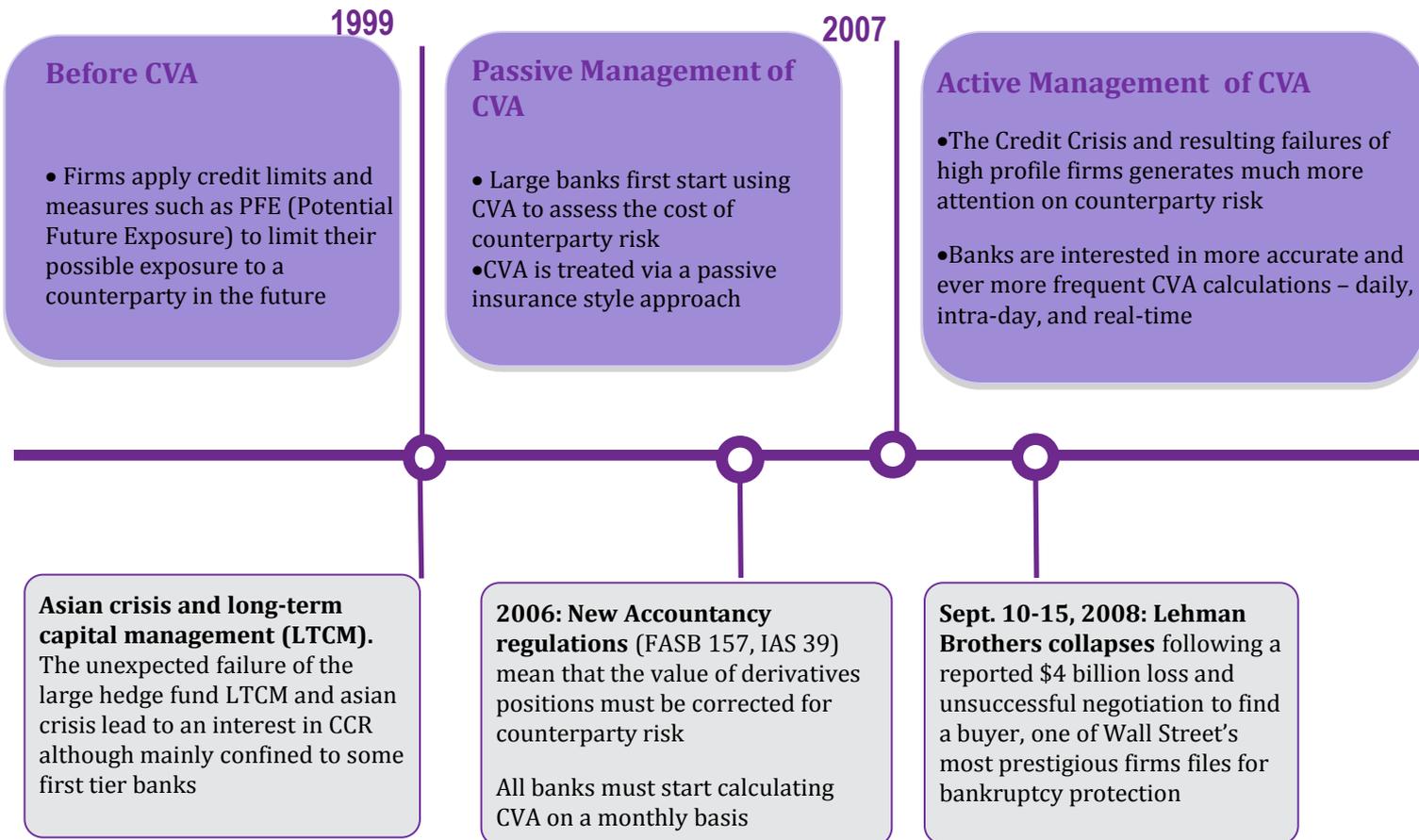
Algorithmics



Agenda

1. History
2. Why now –Survey; background
 - 2-1 Highlight
 - 2-2 Key findings
3. Updated! CVA in last 6 - 10 months
4. Definition, Calculation Framework, Data Requirements
5. Future directions (?)
6. Final Thoughts

1. History



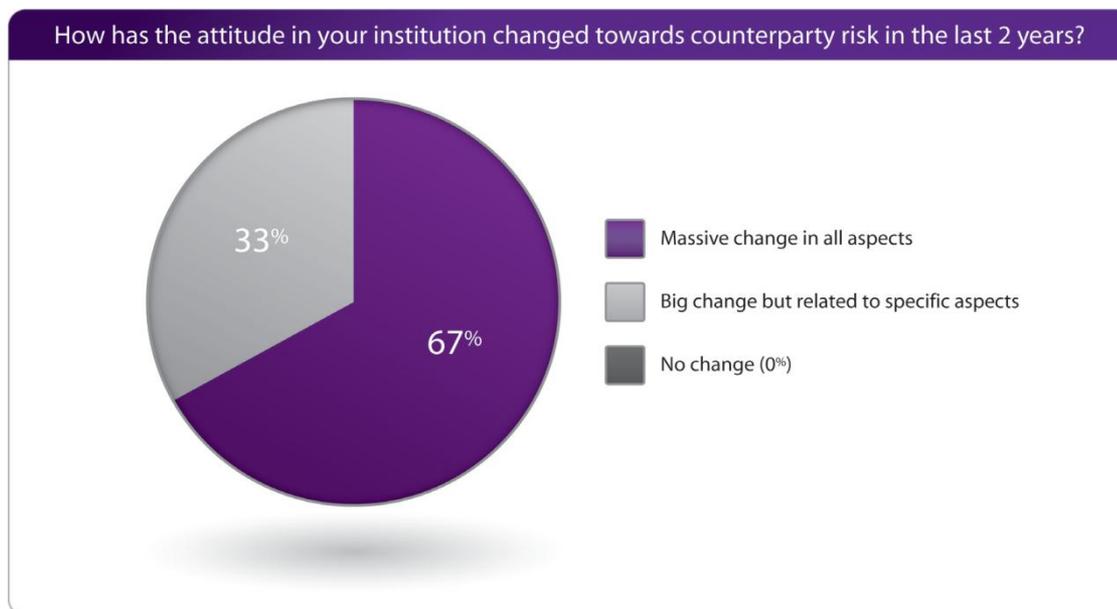
2. Why now - Survey

Background

- Financial crisis - Market volatility experienced during the financial crisis has driven many firms to review methods for accounting and counterparty credit risk
- Lessons learned, risk management enhancement for the future.
- Credit Value Adjustment offers an opportunity for banks to move beyond the *control* mindset – to *dynamically price* counterparty credit risk directly *into* new trades
- Algorithmics conducted in-depth research in Q4 2009 with Risk Professionals (from Banking sector) to gain insight on the approach firms are taking with the emergence of CVA
- This helps us understand how CVA is currently being measured, where CVA fits into their systems, and how CVA practices are expected to evolve

2-1. Highlight: Counterparty Credit Risk – Renewed Focus

- Two thirds stated there has been a systemic shift in attitude towards counterparty credit risk

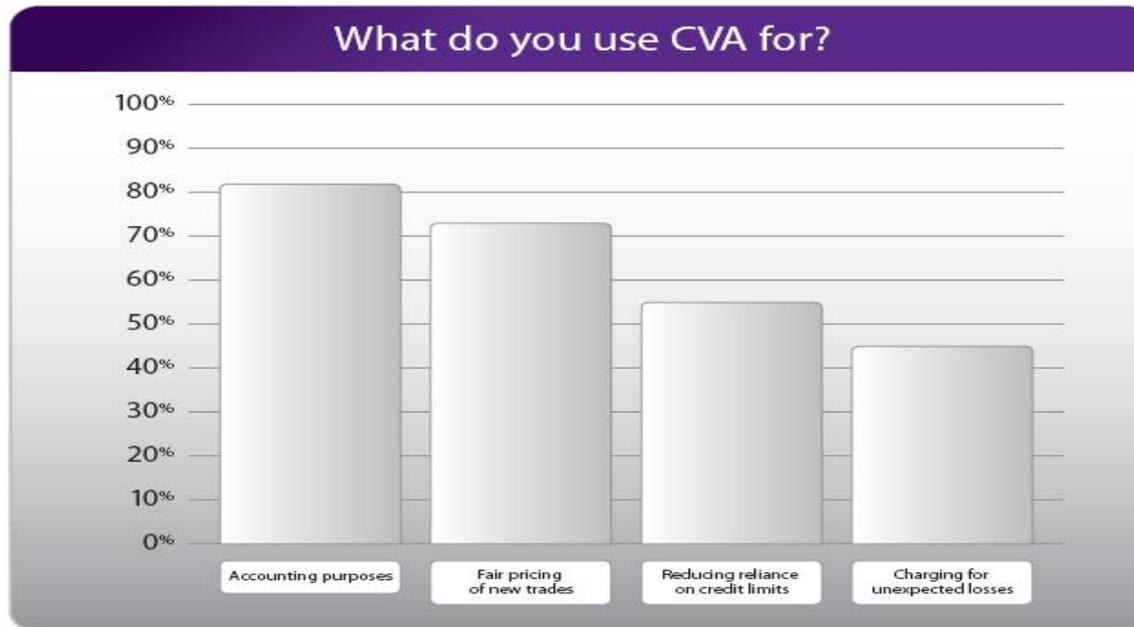


Source: Credit Value Adjustment: and the changing environment for pricing and managing counterparty risk, Algorithmics, December 2009

- Areas which have become more important are Collateral (80%), IT Systems (70%), Active Management and Hedging (55%), Real Time Pricing (45%), Wrong Way Risk (45%), and Central Counterparties (10%).

2-1. Highlight: Purpose and Management of CVA

- The main purpose of CVA today is to facilitate accounting reporting, followed by front office pricing:



Source: Credit Value Adjustment: and the changing environment for pricing and managing counterparty risk, Algorithmics, December 2009

- In the front office CVA is owned by either a single front office unit (58%), in multiple groups (25%) or in a single risk group (17%).
- 50% calculate CVA monthly, 25% daily, and 25% in real time

2-1. Highlight: Purpose and Management of CVA

- How are the real time and intraday calculations achieved?

Calculation Type	%	Pros	Cons
Add-On Exposures	42%	Easy and Fast Calculation	<ul style="list-style-type: none">•No Mitigation effects (Netting & Collateral)•No Diversification Effects
Multi Monte Carlo	33%	<ul style="list-style-type: none">•Mitigation Effects•Diversification effects•Maturity	<ul style="list-style-type: none">• Performance
Product by Product basis	17%	<ul style="list-style-type: none">•Diversification effects	<ul style="list-style-type: none">•No Cross Product Netting & collateral

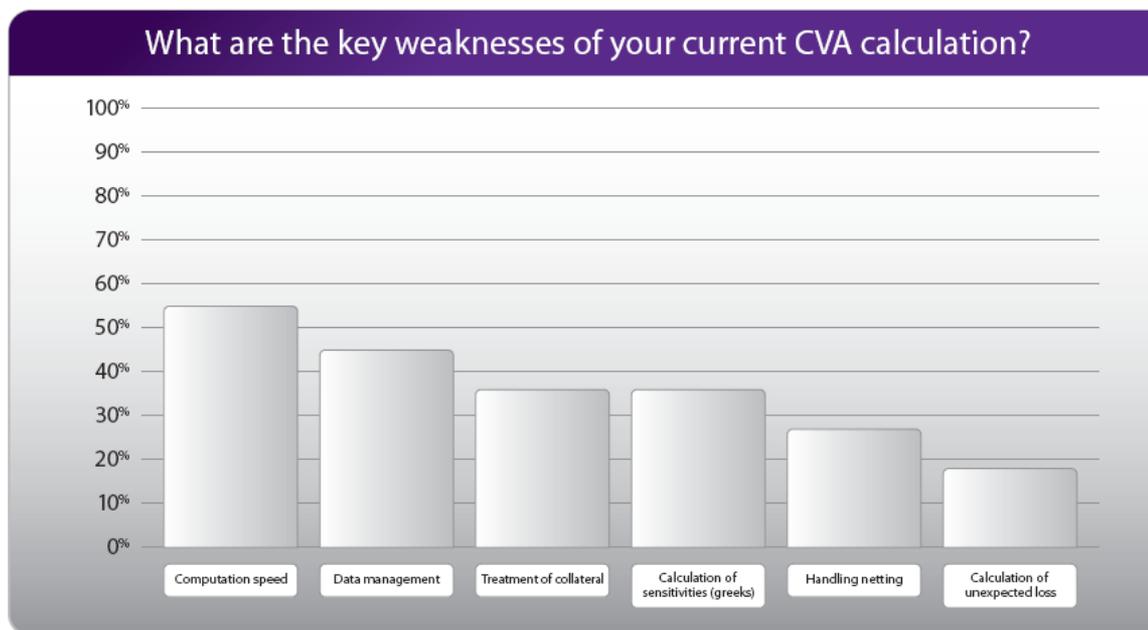
2-2. Five Key Findings

- Key Findings : #1 Pricing of CVA at deal time
- Key Findings : #2 Collateral requirements being tightened
- Key Findings : #3 Being able to capture all products
- Key Findings : #4 Understanding and managing wrong way risk
- Key Findings : #5 Use of own-bank default risk (DVA)

2-2. Key Finding One

#1 Most institutions are pricing CVA into trades at deal time.

- **Large investment into systems for calculating incremental CVA**
- **Push from front office, traders concerned about uncompetitive pricing**
- **Fully simulated incremental CVA allows for risk reducing trades**

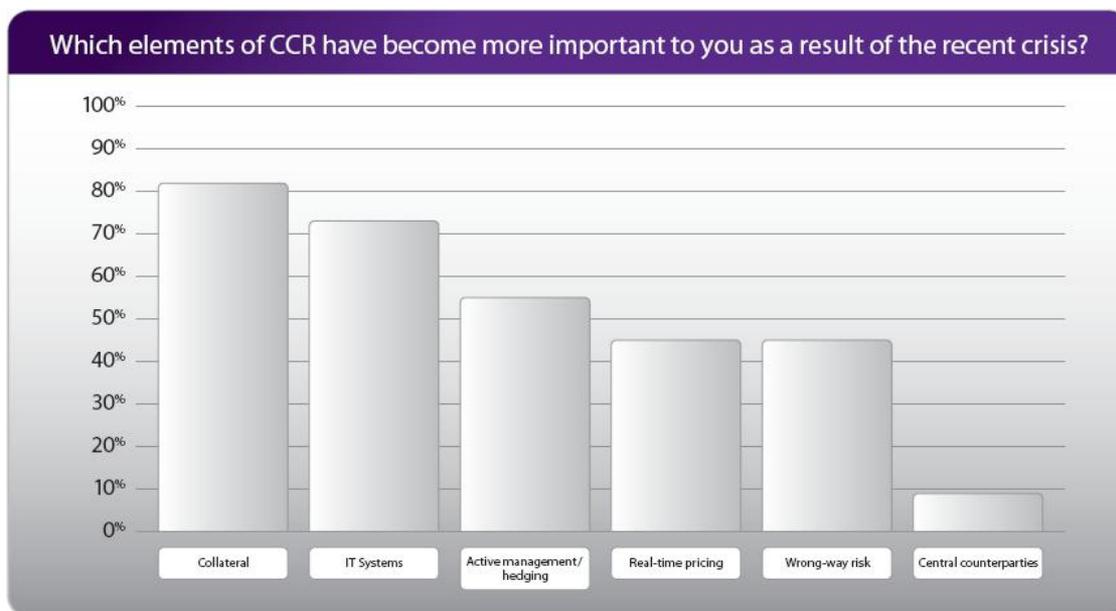


Source: Credit Value Adjustment: and the changing environment for pricing and managing counterparty risk, Algorithmics, December 2009

2-2. Key Finding Two

#2 Collateral requirements are being tightened

- **Daily management of collateral is gaining importance**
- **Regulation is being introduced penalizing capital for failed capital procedures**

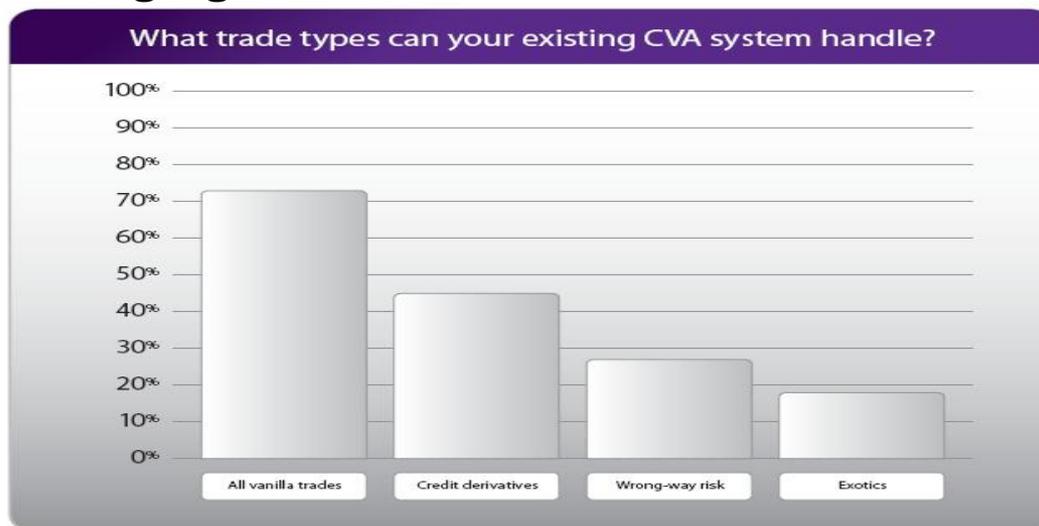


Source: Credit Value Adjustment: and the changing environment for pricing and managing counterparty risk, Algorithmics, December 2009

2-2. Key Finding Three

#3 Being able to capture all products

- Exposure to CCR originates from interest rates (52%), credit derivatives (21%), FX (18%). Equity (5%), Exotics (4%) and Commodities (1%).
- Counterparty CVA – In Netting and collateral case, CVA for CP more competitive
- CVA sensitivities – Estimation of the correct CVA Volatility – Efficient Hedging

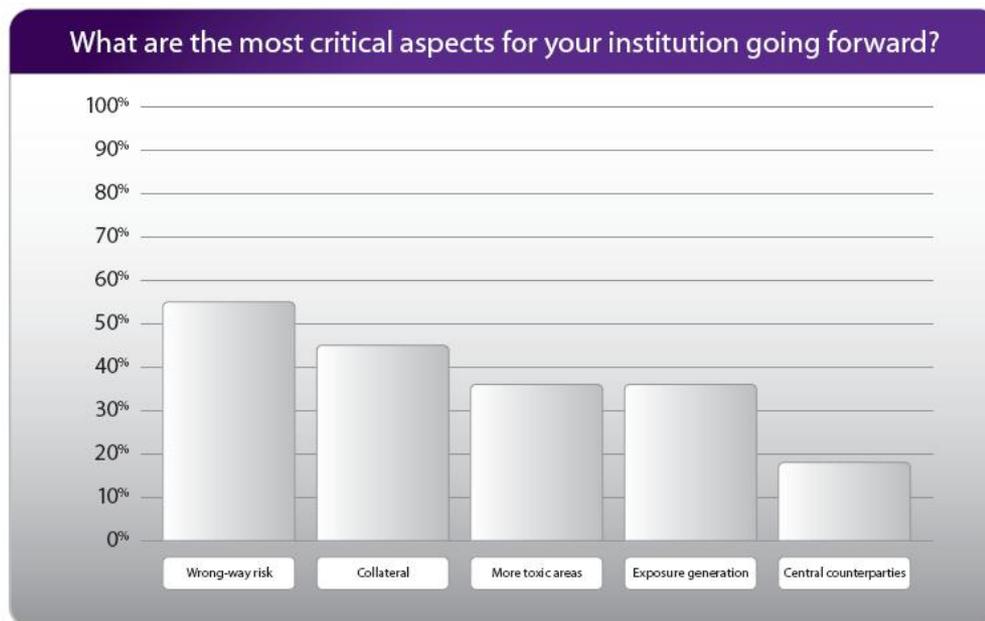


Source: Credit Value Adjustment: and the changing environment for pricing and managing counterparty risk, Algorithmics, December 2009

2-2. Key Finding Four

#4 Understanding and Managing Wrong Way Risk

- **The integration of wrong-way risks within a CVA framework is now considered critical**
- **Can cause a substantial or even catastrophic increase in CCR.**
- **Pragmatic approaches are gaining over complex approaches**

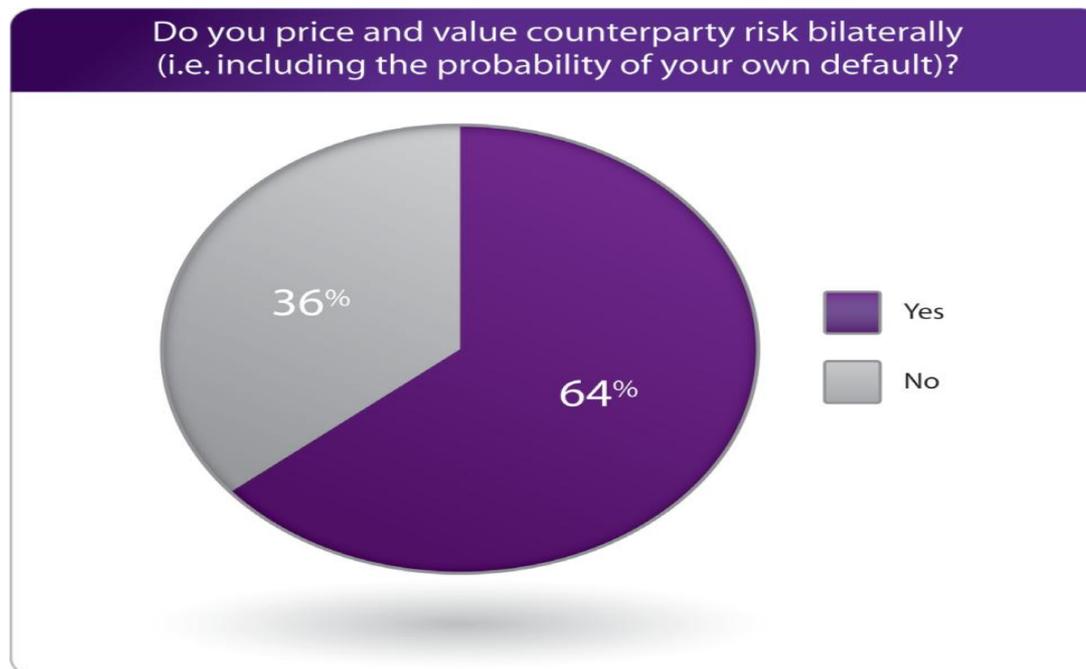


Source: Credit Value Adjustment: and the changing environment for pricing and managing counterparty risk, Algorithmics, December 2009

2-2. Key Finding Five

#5 Pricing counterparty risk based on your own default

- Pricing of DVA is allowed by regulator, and lowers CVA
- Hedging of DVA via selling highly correlated CDS's



Source: Credit Value Adjustment: and the changing environment for pricing and managing counterparty risk, Algorithmics, December 2009

Algorithmics



3. Updated! CVA in the last 6 – 10 months

Banks looking for CVA systems to price CCR and hedge the CVA Vol **<TOP PRIORITY>**
The following Implications to price CVA of an OTC product, have given rise the need and trend for banks to have a “CVA DESK” dedicated to the internal centralization, allocation and management of a firm’s entire CCR across all Products.

High Level Management

- CVA charges not additive across transactions > CVA cannot be priced at the trade level, needs to be measured and managed at high level (e.g. counterparty level)

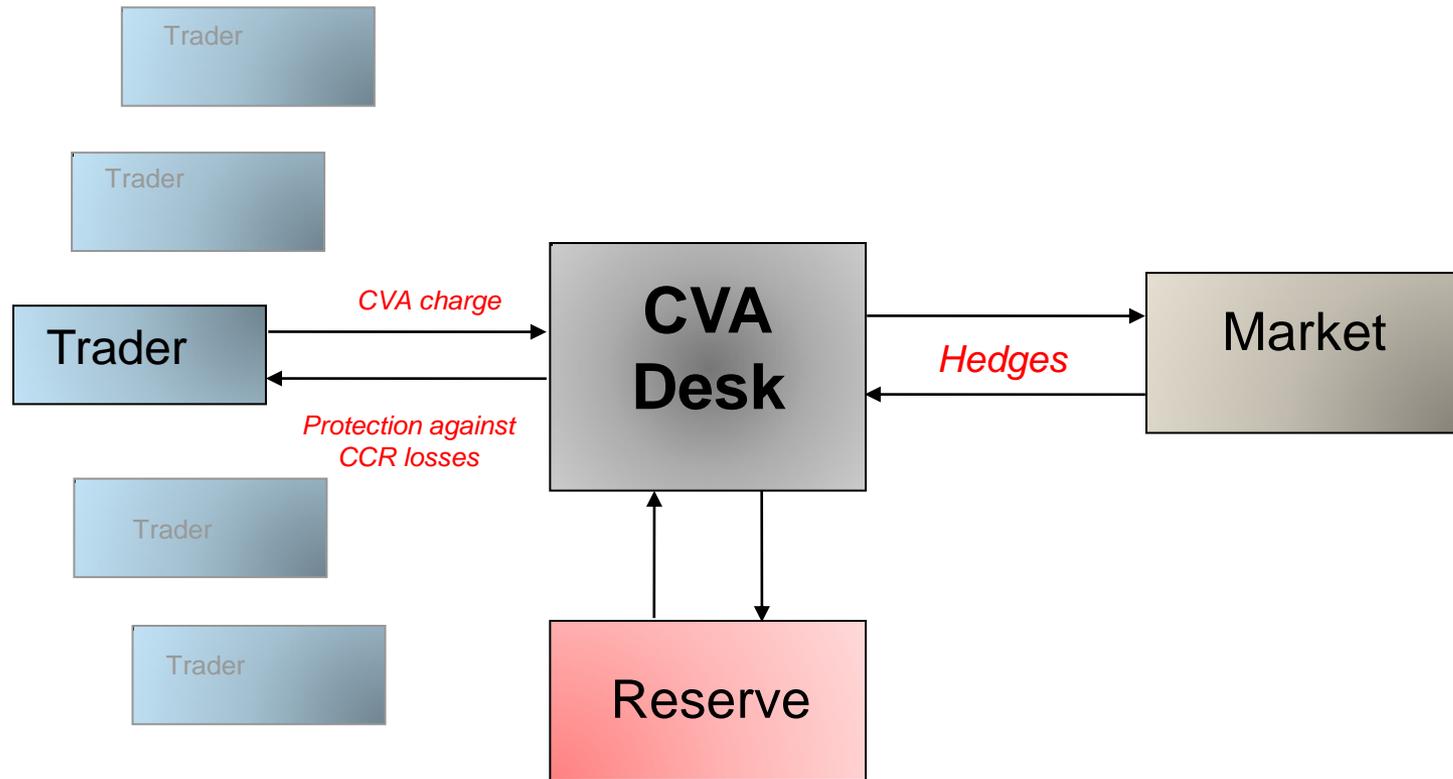
Allocation at Source

- CVA charges can be high > CVA should be charged at source (e.g. then trader makes the correct decision for any trading activity)

Hedging & Management

- Total CVA book will represent a very large component in the PnL > Hedging CVA to market moves is important.

3. Updated! CVA Desk Operation



3. Updated! CVA in the last 6 – 10 months (cont)

Challenges to Set up CVA Desk

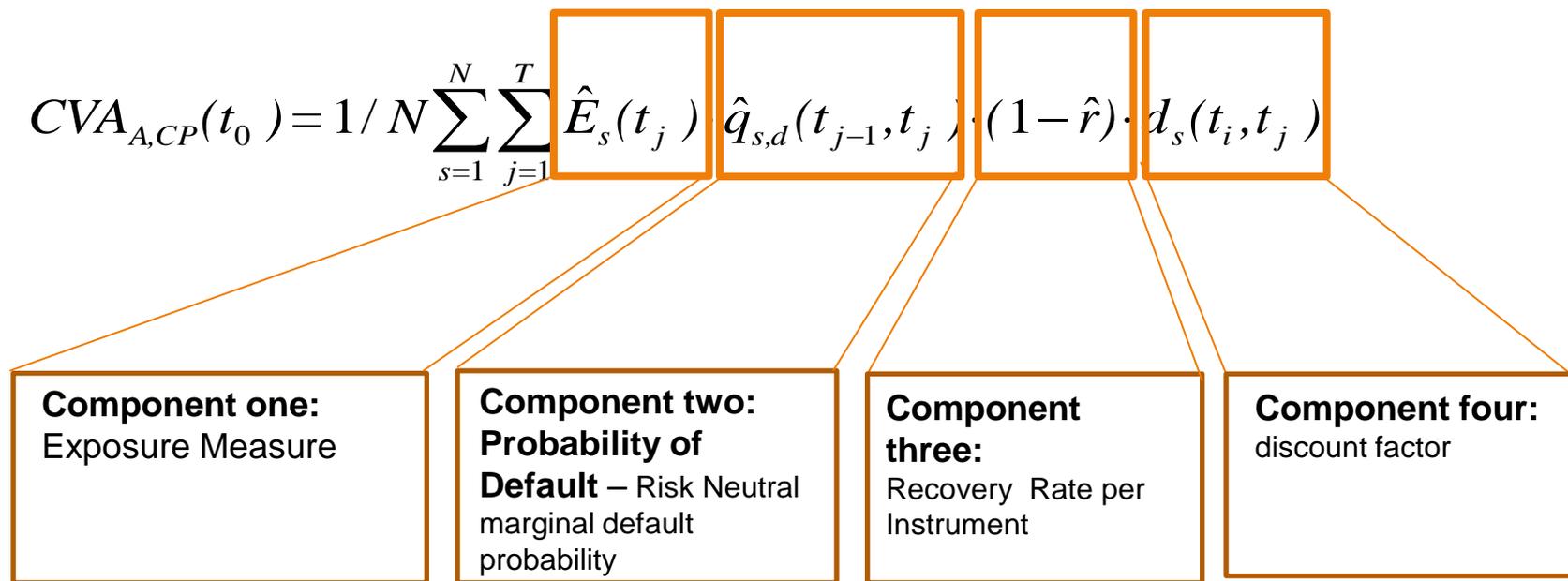
- ✓ Charging for existing CVA
- ✓ Unwinds and negative CVA
- ✓ DVA
- ✓ Additional Termination events (ATEs)
- ✓ Change in terms
- ✓ Cancellation features and optionality
- ✓ Regulatory Capital
- ✓ CVA Hedging

Key Requirements

- ✓ Real Time calculation (hence Performance & advanced Technology)
- ✓ Include all products (including exotics)
- ✓ Include Risk Mitigation (Netting & Collateral), break clauses, early terminations, Margin Period of Risk
- ✓ Wrong Way Risk
- ✓ Bilateral CVA (CVA-DVA)
- ✓ Estimation of Daily and Intraday CVA sensitivities
- ✓ Modular Architecture (Include In house/FO Pricers)
- ✓ Risk Neutral Scenario Generation & Calibration

4. Definition & Estimation

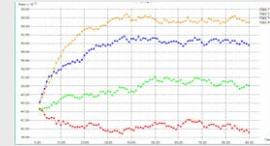
Credit Value Adjustment (CVA) is by definition the difference between the risk-free portfolio value and the true portfolio that takes into account the possibility of a counterparty's default. In other words, CVA is the market value of counterparty Credit risk, Unilateral CVA is given by the risk neutral expectation of the discounted loss.



4. Calculation Framework

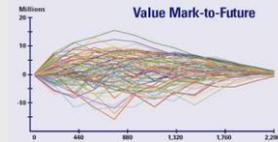
1

**MARKET RISK FACTOR SCENARIO GENERATION
(CVA- Risk Neutral Scenario)**



2

POSITION VALUATION & PRICING



3

AGGREGATION & NETTING



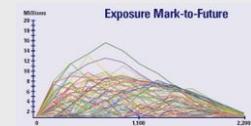
4

COLLATERAL ADJUSTMENT



5

OBTAIN EXPOSURE PROFILE FOR EACH SCENARIO



6

**OBTAIN EXPOSURE METRICS
(CVA- Discounted Exposure Measure)**



4. Data Requirements

▪ Scenarios for all Risk Factors

- ✓ Risk Factors is what changes a trade value
- ✓ Examples: FX , IR, Equity Prices, Implied Volatilities, Credit Spreads
- ✓ Need Volatility and Correlations

▪ Transaction T&C

- ✓ Counterparty Structure with Netting and CSA specifics
- ✓ Everything required to price a transaction
- ✓ Example for an IRS: Fixed Rate, Floating Rate, Reset Frequency, etc.

▪ Risk Neutral Default Curve for each counterparty

- ✓ Implied from the CDS or the bond spreads

5. Future directions (?)

- Banks are trying to establish CVA desk that will allow them to
 - Allocate and charge CVA across businesses / trading desks
 - Hedge the CVA/DVA volatility due to market movements (specifically credit spreads and volatility)
- New Trading Limit based on CVA
 - Exposure Limits can be replaced by CVA
- Basel III – CVA VaR
 - Capital Add –On for CVA risk (Bond equivalent)
- Economic Profit
 - CVA calculation based on Portfolio model by taking into account Market, Credit and Liquidity Risks

6. Final Thoughts

Questions?



Thank you for your time

For further information contact:

Mr. Theodoros Stampoulis
Senior Director

Theodoros.Stampoulis@algorithmics.com
+44 207 392 5807

<日本語でのお問い合わせ先>

津野 直幸

副代表

Naoyuki.Tsuno@algorithmics.com

03-5224-4440

The contents of this document are for your information only. Algorithmics will not be responsible for any loss or damage that could result from any information being made available to you throughout this document.

You are not authorized and you may not copy or duplicate all or any part of this document in any form by any means, or redistribute it to any other person without permission from Algorithmics.

Algorithmics cannot and do not guarantee the accuracy, validity, timeliness or completeness of any data being made available to you throughout this document.