

Breaking Barriers with Fair Value Insight: Overcoming Challenges to Managing ISDA Documentation and Counterparty Credit Risk



FINCAD and **Provident Risk Management, LLC**

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Presenters

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Managing Partner, Provident Risk Management

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Product Manager, SaaS Systems, FINCAD

Agenda

- Collaboration: FINCAD and Provident Risk Management (PRM)
- Market Turmoil
- Managing Documentation and Credit Risk
- Introduction to Fair Value Insight
- Expanding Functionality
- Reporting in Fair Value Insight
- Swap Example
- Maximum Peak Exposure
- Questions

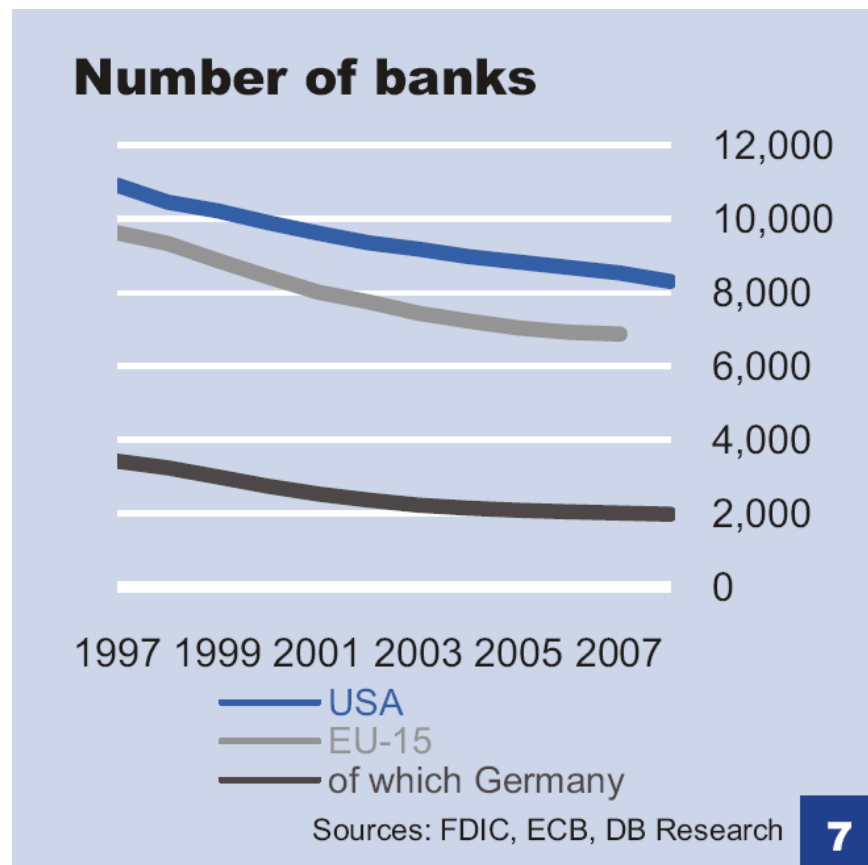
Collaboration: FINCAD and Provident

- FINCAD and PRM collaborated to introduce counterparty credit risk measurements for swaps
- Functionality added with a market view
- Structured, disciplined process leverages FINCAD's industry standard analytics
- Fair Value Insight technology can be used directly or embedded into other workflows

Market Turmoil

- Collapse of major investment banks evidence of need to manage counterparty risk in the derivatives markets
- Vital to understand counterparty exposure, ISDA documentation and impact on liquidity
- Revisiting ISDA terms in reaction to crisis
- Struggling for current mark to market information
- Losses arising from lack of a coordinated Derivatives Risk Management Strategy

Market Turmoil



- Reduction in the number of viable banks reflects counterparty failures
- Increased worldwide attention to counterparty credit risk
- Increased worldwide attention to liquidity positions

Source: Global Banking Trends after the Crisis, Deutsche Bank Research, Jan Schildbach, June 15 2009

Market Turmoil

- Forced termination of negotiated OTC positions
- Forced replacement of hedges in a difficult liquidity environment
- Risk of forced losses without a strategy

Market Turmoil

- Non-defaulting parties were faced with addressing a range of potential risks gripping their derivatives portfolios:
 - Credit Exposure
 - Liquidity Risk
 - Collateral Management
 - Documentation Impairment

Market Turmoil

The Markets forced participants to address very specific questions:

- What is my current exposure to counterparties?
- What is my potential exposure to counterparties?
- Have we managed concentration risk across counterparties?
- How will credit downgrades affect my liquidity?
- What action must I take upon downgrade of my counterparties?
- Does my ISDA documentation permit me to act if a counterparty is materially weaker?
- Is my ISDA documentation complete and do I have a full understanding of all significant terms?

Managing Documentation and Credit Risk

- Provident Risk Management provides consulting expertise and production services to manage ISDA documentation needs and create reporting strategies to calculate and monitor derivatives counterparty credit risk
- **Fair Value Insight** offers a unique set of tools to **measure current and potential credit exposure** and a reporting infrastructure to **value swap transactions individually and by portfolio**
- Fair Value Insight **fulfills the credit risk management needs** of an active swap portfolio

Costs of Managing Documentation and Credit Risk

- Until now, derivatives end users seeking to manage ISDA documentation or implement valuation and credit risk management systems have faced significant **cost hurdles**
- PRM provides corporate end users, banks and money managers with the training, documentation, and risk management capabilities to establish and support an interest rate hedging platform
- PRM delivers a documentation and credit risk management model that is priced on a transaction basis, which eliminates start-up costs, systems overhead and the need to hire documentation specialists

Using Fair Value Insight Systems and Reports

At PRM, we use Fair Value Insight as the foundation for our clients' credit risk management and client market valuation reports.

- Periodic interest rate derivatives valuations
- We offer our clients market valuation reports tailored to meet their specific reporting needs:
 - Clients can tailor reports to monitor individual trade portfolios
 - Clients can define parameters to generate automatic periodic reports
 - Fair Value Insight supports a wide range of interest rate products: vanilla swaps, amortizing swaps, caps, floors or swaptions
 - Fair Value Insight supports FX and commodity derivatives

Polling Question

Introduction to

FAIR VALUE INSIGHT®

A service from

FINCAD® and **ICAP**


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https://fairvalue.fincad.com/default.aspx

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Password

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If you are logging in to FINCAD® Fair Value Insight™ for the first time, the applicable agreement will be presented to you during the login process.

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Login

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Password

Login Clear

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Customer: FVI Provident Webinar

Messages 

- You have been signed out of your current Workgroup.

Select Workgroup 

<u>Name</u> 
Corporate Treasury
FVI Webinar
FX Group
Internal Audit
Risk Management

Go To Manage Workgroups

Customer: FVI Provident Webinar **Workgroup:** FVI Webinar

Current Portfolio
 ---NONE---

- Trades**
- Interest Rate
 - Foreign Exchange
 - Commodity
 - Bonds and Notes

- Workgroups**
- Groupings
 - Trade Import
 - Market Data
 - Reports

Transactions

In this service you can:

- Value transactions for various trade types.
- Produce summary reports from valuation results.
- Create a new portfolio or select a portfolio and assign trades.
- Create new trades within portfolios.
- Create groupings such as Categories and Counterparties and use using prebuilt import templates.
- View market data curves for dates that you specify for bond curves. Also view sub curves, such as money market and bond

Trades	
<input type="checkbox"/>	Interest Rate
	FRAs (0)
	Rate Swaps (1)
	Caps & Floors (0)
	Swaptions (European) (0)
	Swaptions (Bermudan) (0)
<input type="checkbox"/>	Foreign Exchange
	Forwards (0)
	Options (0)
	Option Strategies (European) (0)

<input type="checkbox"/>	Commodity
	Forwards (0)
	Options (0)
	Forward Strips (0)
	Option Strips (0)
<input type="checkbox"/>	Bonds and Notes
	Zero Coupon Bonds (0)
	Level Coupon Bonds (0)
	Floating Rate Notes (0)

Expanding Functionality

- Seamless releases to SaaS system
- Collaboration with customers to add new functionality or to accelerate roadmap
- Example with Provident Risk Management:
 - Counterparty Credit Exposure

Expanding Functionality

- Proven FINCAD analytics library
- Integrated, expandable ICAP market data set to cover your instrument requirements
- Standardized deployment of features include:
 - Screens
 - Analytics
 - ICAP market data
 - Online documentation

Peak exposure and maximum peak exposure. The Peak Exposure (PE) is the maximum amount of exposure expected to occur on a future date with a high degree of statistical confidence. For example, the 95% PE is the level of potential exposure that is exceeded with 5% probability. The curve $PE(t)$ is the peak exposure profile up to the final maturity of the swap with the counterparty. The peak exposure is defined by

$$PE(t) = \inf \{X(t) : P [PFE(t) \geq X(t)] \leq 1 - \alpha\}, \quad (2)$$

where

$PFE(t)$ = potential future exposure for a future scenario at time t , and

α = confidence level for which we want to calculate the peak exposure.

We can interpret the PE defined this way as the first value for which the cumulative probability of the PFE exceeds $1 - \alpha$. For example, if α is 5% then the PE is the level at which the cumulative probability of the PFE exceeds 95%. To calculate this on the trinomial tree, we will generate the discrete distribution at the time step of interest, and interpolate between the cumulative probabilities which are directly above and below the 95% level.

The maximum value of $PE(t)$ over any given exposure horizon is referred to as the Maximum Peak Exposure (MPE).

Expected Exposure. The Expected Exposure (EE) is the average of the distribution of exposures at any particular future date before the maturity of the swap. The expected exposure at time t is

$$EE(t) = E \left[\max(V(t), 0) \right] \quad (3)$$

This is calculated by generating a discrete distribution on the tree at the future date.

Expected positive exposure. The expected Positive Exposure (EPE) is the weighted average over time of the expected exposure, where the weights are the proportion that an individual exposure represents of the entire exposure horizon time interval. The EPE can be calculated as

$$EPE = \frac{1}{t_E} \int_0^{t_E} EE(t) dt \quad (4)$$

where

t_E = end date of the exposure horizon.

In practice, this integral is approximated by a sum over all the tree time step dates up the exposure horizon end date.

Effective expected exposure. Effective Expected Exposure (EEE or Effective EE) is the maximum expected exposure that occurs over the exposure horizon time interval. The EEE can be calculated as

$$EEE(t_E) = \max_{t \in [0, t_E]} (EE(t)). \quad (5)$$

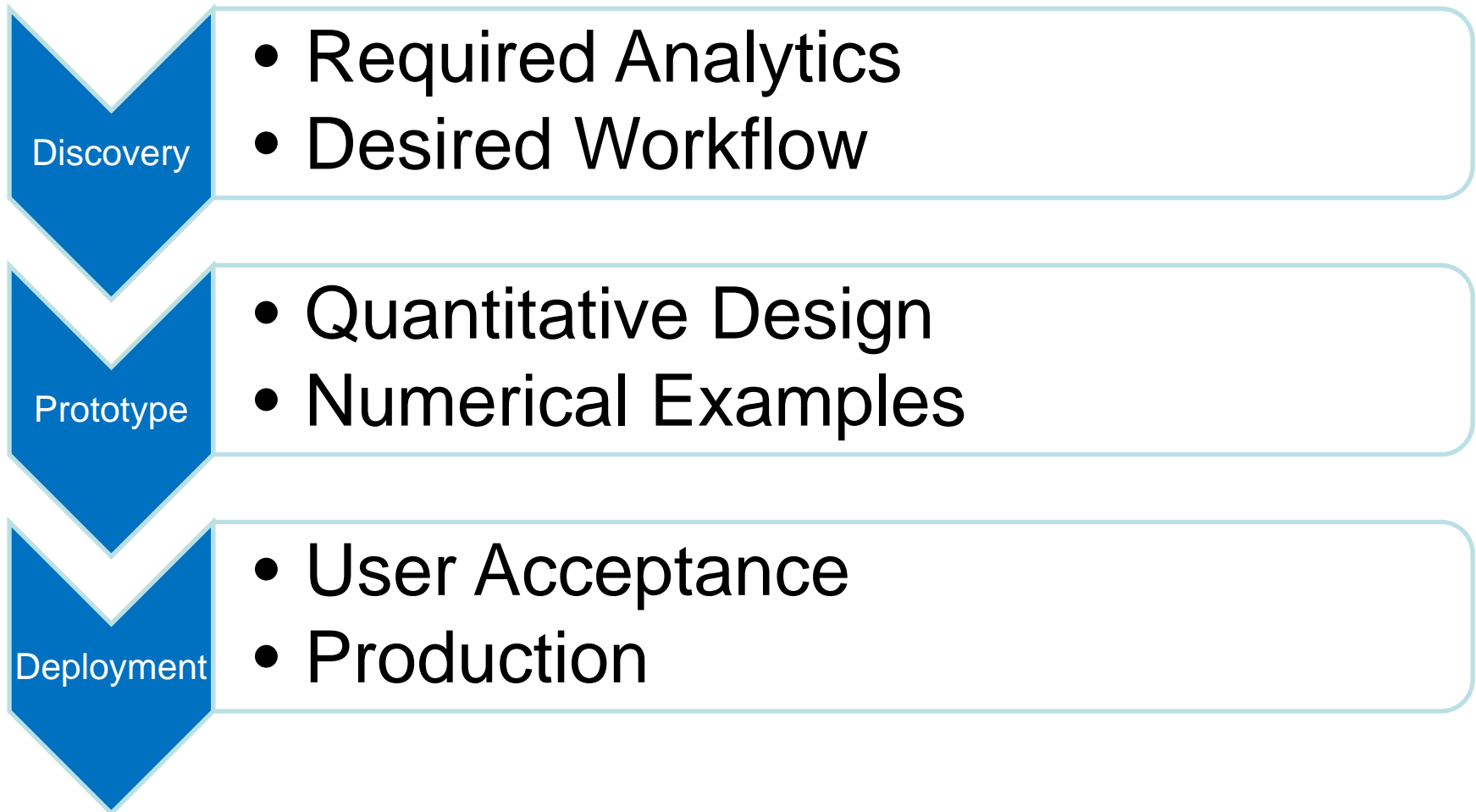
In practice, this maximum is taken over all tree time step dates up to the exposure horizon end date.

Effective expected positive exposure. Effective Expected Positive Exposure (EEPE) is the weighted average over time of the effective expected exposure. The weights are the proportion that an individual exposure represents of the entire exposure horizon time interval. The EEPE can be calculated as

$$EEPE(t) = \frac{1}{t_E} \int_0^{t_E} EEE(t) dt. \quad (6)$$

**Fully transparent methods
with all added coverage.**

Functionality Expansion Process



REPORTS

Name Interest Rate Swaps
 Description Interest Rate Swaps
 Reporting Currency USD
 FX Rate Group USD Rates
 Created Date 6/29/2009

SUMMARY OF PORTFOLIO VALUATIONS

Valuation Date	Reporting Fair Value	Reporting Fair Value (Dirty)	Is Valid?
6/1/2009	1,180,719.16 (USD)	1,911,354.69 (USD)	Yes
5/1/2009	4,603,049.31 (USD)	5,106,717.56 (USD)	Yes
4/1/2009	6,636,070.47 (USD)	6,914,210.78 (USD)	Yes

Valuation Date 6/1/2009

Trade Name	Trade Type	Reporting Fair Value	Reporting Fair Value (Dirty)	Fair Value	Fair Value (Dirty)	FX Rate	Calculated Date
USD50M	Vanilla Interest Rate Swap	607,147.88 (USD)	1,019,909.50 (USD)	607,147.88 (USD)	1,019,909.50 (USD)	1	6/29/2009 4:01:54 PM
EUR 25M	Non-Generic Interest Rate Swap	1,097,101.97 (USD)	1,198,916.53 (USD)	771,330.71 (EUR)	842,912.65 (EUR)	1.42235	6/29/2009 4:01:54 PM
CXSwap_USDJPY	Cross-Currency Interest Rate Swap	-523,530.69 (USD)	-307,471.34 (USD)	-523,530.69 (USD)	-307,471.34 (USD)	1	6/29/2009 4:01:54 PM
TOTALS		1,180,719.16 (USD)	1,911,354.69 (USD)				

Valuation Date 5/1/2009

Name Interest Rate Swaps
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 Reporting Currency USD
 FX Rate Group USD Rates
 Created Date 6/29/2009

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Valuation Date 5/1/2009

Portfolio Detailed Valuation Report

Name Interest Rate Swaps
 Description Interest Rate Swaps
 Reporting Currency USD
 FX Rate Group USD Rates
 Created Date 6/29/2009

Trade Name	Trade Type	Reporting Fair Value	Reporting Fair Value (Dirty)	Fair Value	Fair Value (Dirty)	FX Rate
USD50M	Vanilla Interest Rate Swap	607,147.88 (USD)	1,019,909.50 (USD)	607,147.88 (USD)	1,019,909.50 (USD)	1
EUR 25M	Non-Generic Interest Rate Swap	1,097,101.97 (USD)	1,198,916.53 (USD)	771,330.71 (EUR)	842,912.65 (EUR)	1.42235
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SUMMARY OF PORTFOLIO VALUATIONS

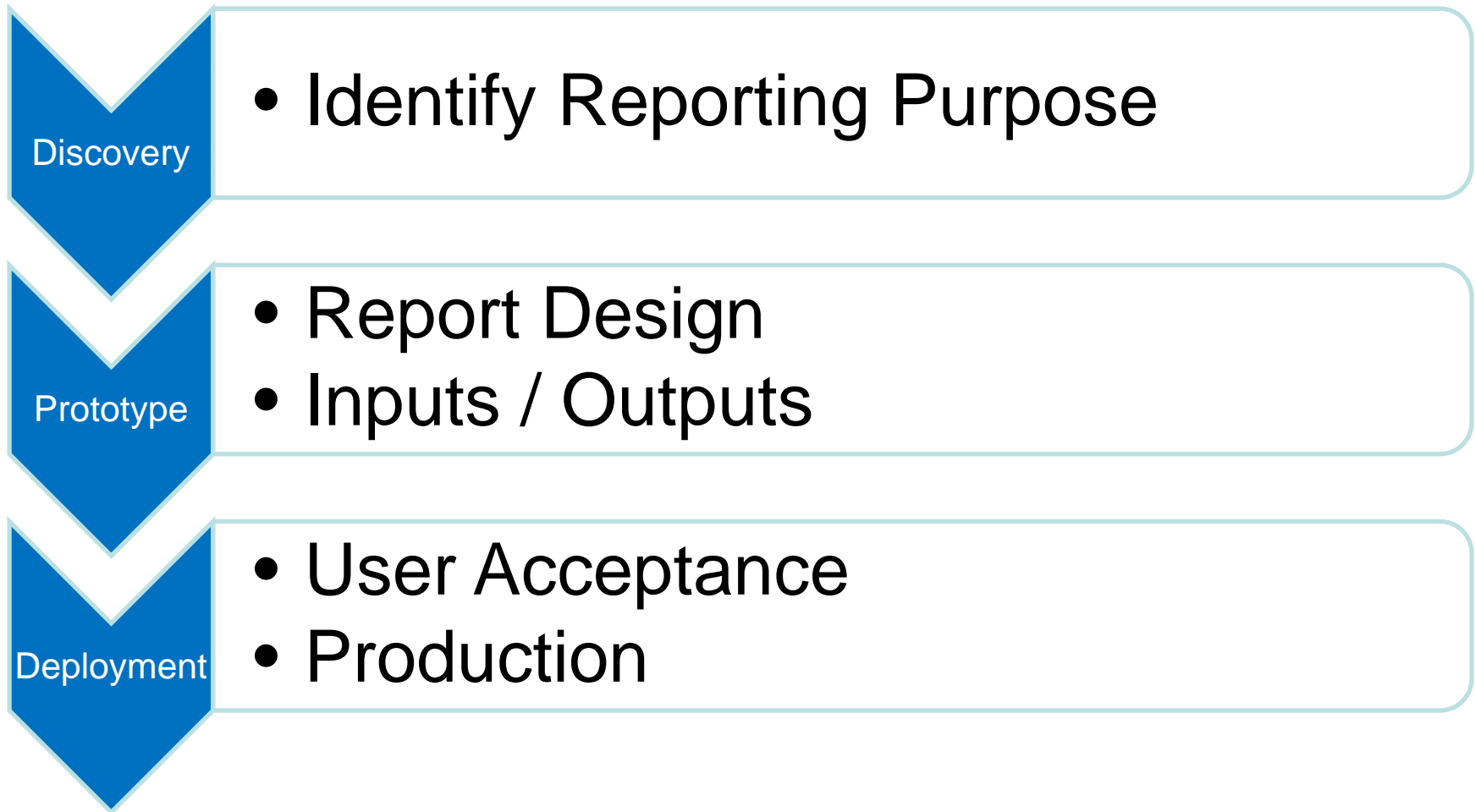
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TOTALS		1,180,719.16 (USD)	1,911,354.69 (USD)				

Valuation Date 5/1/2009

Report Creation Process



Using Fair Value Insight Systems and Reports

Understanding Derivatives Credit Risk: Maximum Peak Credit Exposure:

- A current mark-to-market valuation for a swap is a measure of the credit exposure to a counterparty if the counterparty were to default and the swap were to be terminated today
- We know the value of derivative contracts fluctuate significantly over time; therefore, it is important in any credit analysis to model credit exposure at future times. This is known as **potential credit exposure**
- Fair Value Insight calculates Maximum Peak Exposure (“MPE”) using the Hull & White model. The MPE model generates a probability distribution of rates at future points in time from which the maximum potential level of credit exposure at a given confidence level is calculated. **Fair Value Insight calculates MPE on interest rate swaps at a 95% confidence level**

By applying Fair Value Insight’s MPE calculations to each transaction, PRM is able to offer clients an objective measure of potential credit risk.

SWAP EXAMPLE

Example Swap

- A corporation issues \$25 million of 5 year notes with a 5.00% coupon
- They then enter into a swap to receive fixed and pay variable

Customer: FVI Provident Webinar Workgroup: FVI Webinar

Edit Vanilla Interest Rate Swap

Cancel Save

Main

Reporting Currency USD ▾

Notional Amount 25,000,000.00

Effective Date 7/5/2009 (M/d/yyyy)

Maturity Date 7/5/2014 (M/d/yyyy)

Business Days New York ▾

Business Days Convention modified following business day ▾

Fixed Payments Receive Leg ▾

Details

Name ABC Corp_5yr_25M

Counterparty Hedge Bank ▾ (optional)

Category (optional)

FAS 157 Level (optional)

FAS 157 Description (optional)

Fixed Leg Details

Payment Dates semi-annual ▾

Day Count (coupon) 30/360(ISDA) ▾

Fixed Rate 2.85%

Discounting Curve USD Swap NY Close (LIBOR) ▾

Floating Leg Details

Payment Frequency / Designated Maturity of the Index pay freq quarterly /reset freq quarterly ▾

Day Count (coupon) actual/360 ▾

Discounting Curve USD Swap NY Close (LIBOR) ▾

Accruing Curve USD Swap NY Close (LIBOR) ▾

Reset Table USD Libor (3-month) ▾

Spread 0.00%

Cancel Save

Customer: FVI Provident Webinar Workgroup: FVI Webinar

View Interest Rate Swap

View: [Basic](#) | [Detailed](#) | [Export](#)

[?](#)
Done

Swap Valuations

Valuation Date	Fair Value (Clean)	Accrued Interest	Fair Value (Dirty)	DV01	Date of Calculation	
6/8/2009	-878,414.45 (USD)	0.00	-878,414.45 (USD)	-11,030.729837	7/21/2009 3:35:59 PM	Delete
6/15/2009	-409,786.37 (USD)	0.00	-409,786.37 (USD)	-11,308.244713	7/21/2009 3:35:51 PM	Delete
6/22/2009	-387,988.15 (USD)	0.00	-387,988.15 (USD)	-11,324.087723	7/21/2009 3:35:43 PM	Delete
6/29/2009	-98,317.75 (USD)	0.00	-98,317.75 (USD)	-11,496.318647	7/21/2009 3:35:37 PM	Delete
7/6/2009	33,928.25 (USD)	0.00	33,928.25 (USD)	-10,944.93017	7/21/2009 3:36:38 PM	Delete

Edit	Calculate	Credit Exposure
<p>Main</p> <p>Reporting Currency: USD</p> <p>Effective Date: 7/5/2009</p> <p>Maturity Date: 7/5/2014</p>		<p>Details</p> <p>Swap Type: Vanilla Swap</p> <p>Name: ABC Corp_5yr_25M</p> <p>Counterparty: Hedge Bank</p> <p>Category:</p> <p>FAS 157 Level:</p> <p>FAS 157 Description:</p> <p>Maturity Status: live</p>
<p>Valuation as of: 7/6/2009</p> <p>Fair Value (Clean): 33,928.25 (USD)</p> <p>Accrued Interest: 0.00</p> <p>Fair Value (Dirty): 33,928.25 (USD)</p> <p>DV01: -10,944.93017</p> <p>Date of Calculation: 7/7/2009 4:12:14 PM</p>		
Edit	Calculate	

Swap Receive Leg

Leg Name	Leg Type	Currency	FX Rate	Notional Amount	Effective Date	Maturity Date	Fair Value (Clean)	Accrued Interest	Fair Value (Dirty)
ABC Corp_5yr_25M	Fixed leg	USD	1	25,000,000.00	7/5/2009	7/5/2014	3,357,532.78 (USD)	0.00	3,357,532.78 (USD)

Swap Pay Leg

Leg Name	Leg Type	Currency	FX Rate	Notional Amount	Effective Date	Maturity Date	Fair Value (Clean)	Accrued Interest	Fair Value (Dirty)
ABC Corp_5yr_25M	Floating leg	USD	1	25,000,000.00	7/5/2009	7/5/2014	-3,323,604.53 (USD)	0.00	-3,323,604.53 (USD)

Customer: FVI Provident Webinar Workgroup: FVI Webinar

View Credit Exposure Report Definition



Done

Interest Rate Swap

Name	Swap Type	Reporting Currency
ABC Corp_Syr_25M	Vanilla Swap	USD

Edit

Report Definition	
Name	ABC Corp_Syr_25M - 95.00 % 5 Years
Peak Exposure Confidence Level	95.00 %
Exposure Horizon	5
Exposure Horizon Units	Years

Edit

Credit Exposure Report

Reporting Date	Maximum Peak Exposure	Maximum Peak Exposure Date	Is Valid?	Date of Calculation	
6/22/2009	2,565,907	11/20/2010	Yes	7/21/2009 3:44:56 PM	Edit Delete
6/29/2009	2,809,500	11/27/2010	Yes	7/21/2009 3:44:47 PM	Edit Delete
7/6/2009	2,838,519	12/4/2010	Yes	7/21/2009 3:44:34 PM	Edit Delete

Add

Done



Customer: FVI Provident Webinar Workgroup: FVI Webinar

View Credit Exposure Report

View: [Basic](#) | [Detailed](#) | [Export](#)

Interest Rate Swap

Name	Swap Type	Reporting Currency
ABC Corp_5yr_25M	Vanilla Swap	USD

Parameters		Credit Exposure	
Reporting Date	7/6/2009	Maximum Peak Exposure	2,838,519
Calibration Source	Market Data	Maximum Peak Exposure Date	12/4/2010
Calibration	USD HW Calibration (using Long-Term Swaptions)	Expected Positive Exposure	300,670
Short-rate Volatility	1.7862 %	Effective Expected Exposure	523,248
Mean Reversion Constant	5.00 %	Effective Expected Positive Exposure	500,384
		Exposure End Horizon Date	7/5/2014
		Confidence level	95.00 %
		Market Data Date	7/6/2009
		Date of Calculation	7/21/2009 3:44:34 PM

Credit Exposure Profile



Back

Risk Management Strategies

Take a “Second Look” at your existing Derivatives portfolio:

PRM provides a detailed review of existing derivatives portfolios to evaluate derivatives users' exposure to counterparty credit risk. The review process combines three risk measures:

Derivatives Documentation Risk Matrix: The first component is a detailed review and scoring of existing and proposed ISDA Master Agreements. The goal of this review is to provide a snapshot risk profile, each document is scored for credit, liquidity and rights impairment risk

Maximum Potential Credit Exposure Review: The second component is a transaction specific review of the MPE to each counterparty. This analysis will identify risk concentrations based on a worst case potential credit exposure analysis using the Fair Value Insight MPE model

Periodic Credit and Liquidity Risk Reporting: The third component involves designing and implementing a suite of credit risk and collateral reports using Fair Value Insight to monitor and model current credit exposure and potential credit exposure. We also monitor counterparty credit quality on an on-going basis

Conclusions

- Healthy Risk Management Practice for Swaps Includes:
 - Understanding ISDA documentation
 - Ongoing awareness of portfolio values
 - Awareness of counterparty credit risk
- Fair Value Insight Provides:
 - Valuations on demand
 - Counterparty credit measurements by trade
 - Ease of use and transparency in both
 - Disciplined expansion to meet needs

More Information

For more information or to request a customized demonstration of Fair Value Insight, please contact FINCAD:

info@fairvalueinsight.com

www.fairvalueinsight.com

604-957-1200

For information about Provident Risk Management's services, contact:

info@providentrisk.com

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Phone: 704-243-1439

Links to the recorded webinar, slides and Q&As will be available on our website:

<http://www.fincad.com/news-events/events/webinars.aspx>