

VaR and Dynamic Allocation of Economic Capital

An in-house course
Presented by
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General

This course discusses Value at Risk methodology and the allocation of economic capital. Delegates will learn the key concepts and will retain them through the use of many illustrative examples. In particular, we use many spreadsheet examples as well as "stories from the field" to illustrate the relevant points.

Banks are facing immense challenges to achieve sustainable profitability. Margins are depressed and banks are forced to enhance their performance management capabilities. Regulations such as Basel II are providing the impetus for banks to establish a foundation for robust performance management.

To respond to these challenges, institutions need to be able to adopt a framework that will enable them to quantify any dimension of their performance, such as by business, product or customer. They achieve this by breaking out all expected losses and embedded costs to determine the net commercial margin for the enterprise at all levels. In addition, they must determine the potential size of unexpected losses up to a pre-defined probability limit. This will be a key factor in determining the amount of capital required to support the risk associated with that activity.

This ensures that the analysis is consistent and comprehensive across all dimensions. These include Market, Credit as well as Operational and other risks. By adjusting expected average returns by the likelihood that they will materialize (i.e. their volatility), or RAROC, banks are able to assess and improve their true performance. The lower the volatility of an average return, the more it is attractive to a bank because less economic capital will need to be set aside for it.

A framework of 'economic capital' enables banks to identify every risk and cost component for allocation to the area of the organization that's most competent to deal with them. These units can then be monitored and given appropriate incentives to achieve the best possible results against predetermined benchmarks. Banks are also enabled to calculate and report on their exposures to regulators more accurately. The follow-on effects are powerful. The regulator has already hinted at a more favorable treatment to banks who can quantify their risks and exposures. In addition,

the framework allows senior managers and the board to identify and track performance across the institution, enabling all departments to analyze product, customer and business unit data. In turn, this allows them to build a far more accurate and detailed picture of the institution's holistic performance, driving better decision-making and paving the way to increased profitability.

Summary of Workshop

This workshop discusses Value at Risk methodology and the economic capital paradigm.

Why should you attend

In this five day seminar, we cover many aspects of risk measurement and management as well as how some of the major institutions set economic capital. The seminar was developed at the request of the US banking regulator (the FDIC - "Federal Depositors Insurance Corporation"). They were so happy with it that they have already run it again for a new group of people.

One of the advantages of this seminar is that it explains the concepts from a "common sense" point of view. Rather than concentrating on obscure mathematical formulas, we cover the central themes and issues. Many examples and case studies are used. Each participant receives several hundreds of pages of notes as well as access to a wide variety of spreadsheets to do "what if" simulations.

We also include, assess and analyze the top management risk management reports from one of the largest banks in North America. These are very difficult to obtain. A regulator can use these to gain insight into a bank's view of risk management. Bank personnel can compare the format of their reports to the one that will be presented in the seminar.

Who should attend

- Accountants and Auditors
- Business Consultants
- Business and Strategy Development Managers
- Chief Executive Officers
- Chief Financial Officers
- Company Secretaries
- Corporate Strategists, Developers and Planners
- Financial Analysts
- General Managers
- Investment Analysts
- Managing Directors
- Policy and Strategy Directors

- Portfolio Managers
- Risk Directors and Managers
- Structured Finance Specialists
- Treasury Directors and Managers

What will you Learn

- Delegates will learn up-to-the-minute capital allocation techniques and overcome practical obstacles in integrating risk management, capital allocation and performance measurement.
- Key concepts are retained through the use of many illustrative examples. In particular, we use many spreadsheet examples as well as "stories from the field" to illustrate the relevant points.
- The focus of the course is always on the *practical* rather than the *theoretical*.

Workshop Highlights

- The relationship between economic and regulatory capital
- The role of capital management in shareholder value
- Allocating economic capital to business units
- Meeting regulatory requirements
- Building an economic capital model
- Integrating balance sheet management into a risk capital framework
- The impact of Basel II on capital requirements

Benefits of implementing an 'economic capital' framework

- The ability to identify in real-time the departments, investments and initiatives that are performing well, enabling additional resources to be deployed for maximum return and the lessons of success to be applied to other business areas;
- The opportunity to identify under-performing areas of the bank's business, enabling them to be reassigned to more appropriate functional departments, reengineered or suspended;
- The knowledge that strategic decisions are based on firm, factual evidence and not hunch or guesswork;
- The creation of a level playing field that enables investments and other initiatives to be compared on a like-for-like basis;
- The opportunity to save management cost and time through an acceleration of the decision-making process and by identifying, then eliminating, low-value initiatives and investments.

Day 1

This day is intended as an introduction to Value at Risk and the concepts behind it

Introduction to Risk Management

- The need for Risk Management Systems
- Introduction
- A short history
- Accounting system vs. risk management system
- Lessons from recent financial disasters
- Typology of risk exposures

Methods of measuring exposure:

- Notional amount
- The Greeks: Delta, Gamma, Vega
- Value of a Basis Point BVP01
- Duration, Convexity
- Credit Spread Duration

Case study: compute risk measures for a sample portfolio (e.g. a portfolio convertible bonds)

The concept of Value at Risk

- The idea behind VAR
- Advantages and disadvantages
- Examples

Different VAR methodologies

- Analytic variance-covariance approach
- Historical
- Historical Simulation
- Stochastic Simulation

VAR for non-linear instruments

- Option embedded bonds
- Equity options
- Other derivatives

Case study: compute the VAR for the same sample portfolio

Extensions of VAR

- Incremental VAR (IVaR)
- DeltaVar DVaR
- Stress testing and scenario analysis
- Dynamic VaR
- Limitations of VaR

Day 2

Introduction to economic capital, the concept and the calculations

Economic Capital

Introduction to Economic Capital

- Quantifying the risks a company faces
- Calculating the capital needed to cover these risks
- What are the real returns being made?
- Accounting for the cost of risk
- Determining which ventures create the most value

RAROC (Risk Adjusted Return on Capital)

- The concept of RAROC
- RAROC vs. NIM (Net Interest Margin)
- RAROC and bonuses
- Capital Allocation and Performance Measurement

A thorny issue?

- Tying bonuses to RAROC rather than to pure P&L
- The experience of some leading firms

Debate: the pros and cons of tying bonuses to RAROC measures

Regulatory Capital

- How "economic capital" is different than "regulatory capital"
- Cases of obvious discrepancy

A Short History of the Regulatory Landscape

- Group of Thirty policy recommendations
- The 1998 BIS Accord - the "Accord"
- The 1996 amendment
- The BIS2000+ accord
- Other regulatory releases

Day 3

This day is devoted to credit risk, credit derivatives and assignment of capital to credit risk

Overview of Credit Risks and Their Effects

- Evaluating three key issues:
 - pricing of credit losses
 - managing credit lines
 - calculating credit risks and capital charges
- Assessing the three components of credit risks:
 - exposure to single counter party
 - default probability
 - recovery rates

- Credit risk vs market risk
- Credit buckets

Case study: credit risk management at the big multi-national banks

Determining the Probability of Counterparty Default

- A comparison of three approaches to default:
 - Flesaker et al
 - Black, Scholes & Merton
 - Longstaff & Schwartz
 - Hazard Rates
- Compare and contrast the approaches

Netting as a Successful Technique for Reducing Credit Exposure

- What are the principal forms of netting
- Identifying the risks and how netting can mitigate these risks
- Cross-border netting/cross product netting
- Assessing the impact of netting on a counterparty's potential credit exposure
- Understanding the role of the regulators and their interest in netting systems
- How documentation can strengthen your netting position
- The legal perspective: when can you net and which countries would let you do it?

Pre-settlement and settlement risks

- Pre-settlement risks
- Settlement risks
- Cross currency settlement risks
- Example: an interest rate swap
- What is the "Herstatt Risk"?

Credit risk modeling and data issues

- Data requirements for market and credit risk modeling
- Dealing with sparse data and poor quality data (e.g. Asia or Emerging Markets)
- Modeling credit risk
- Ratings-based approach
- Equity-based approach
- Hull, Nelken & White: Volatility Skews and the Credit Markets
- Compare and contrast the various approaches
- Combining market and default risk to find the total credit risk

Case study: comparing availability of data in various markets

Extreme value theory (EVT) - theory and practice

- What is an extreme event: examples from the field
- The collapse of the Soviet Union
- Long Term Capital Management
- October 1987
- October 1998
- September 2001
- Leptokurtosis : Focusing in on the "fat tails"
- Techniques from the insurance industry
- The "Pareto" distribution
- Is EVT Useful?

Portfolio Credit Risk Management

- Looking at different approaches
- JP Morgan - CreditMetrics/CreditManager
- CSFP - CreditRisk+
- McKinsey and Company - CreditPortfolioView
- Moody's KMV - PortfolioManager
- Compare and contrast the different approaches

Evaluating the Credit Derivatives Market and the Rationale for its Development

- Current and future potential of credit derivatives market
- Assessing the size of the market in terms of capacity and liquidity
- The size of the market and the distribution among product lines and underlying instruments
- Difficulties in developing a true "two way" market
- Evaluating the potential for a secondary market in credit derivatives
- How the Euro has impacted on the credit derivatives market
- Credit derivatives: the US experience
- The recent credit crunch and its implications on the market

Different Structures and Assessing their Risks to Ensure Successful Implementation

- Default Swaps & Options
- Total return swaps
- Credit linked notes
- Put credit spreads on asset swaps
- Credit spread notes
- Demystifying the risks: cross, equity, term structure, settlement, legal and basis risk

- Collateralized Debt Obligations CDO's: Collateralized Bond Obligations (CBOs) and collateralized loan obligations (CLOs)
- Downgrade options and their uses

Case study: pricing a credit derivative

Examples of sample terms sheets

- Examining specific terms sheets
- What is the use of each structure
- Why is someone purchasing the structure
- How is it created
- What are the benefits to the issuer
- The ISDA definitions booklet

Day 4

This day is devoted to operational risk and integrated risk management

Operational risk

- What is it and why does it matter

Factors Effecting the Importance of Operational risk

- Market consolidation and margin squeeze
- The complexity and sophistication of IT systems
- Regulatory and risk capital allocation pressures
- Hidden risks posed by complex financial products
- Improved communication and reliance upon efficient IT systems and STP

Discussion: who should manage operational risk?

Risks identified and defined

- Fraud
- Systems and operations
- Model risk
- Communication
- Documentation
- Delivery and settlement - matching the book

Discussion: operational risk qualitative vs. quantitative

Specific Risks

- Technology
 - Systems failure
 - Model risks
 - Programming errors

- o Telecoms
- People
 - o Incompetence
 - o Fraud
- Process
 - o Execution error
 - o Booking error
 - o Transaction and mis-matching of trades

Workshop: identify all the risks in a derivative trade

Accidents and insurance

- What is the company's liability to accidents?
- How is this measured?
- How does this get included in the overall risk profile?
- What sort of insurance premiums do we expect to pay?
- Over-insurance vs. under-insurance

Discussion: compare several companies and their approach to insurance

Steps towards operational risk management

- Self-assessment
- Collection of operational-loss data
- Capital calculation
- Examples from the field

Discussion: Using internally generated loss data vs. publicly available data

Policies and procedures

- Best Practices
- Business Structure
- Examples of failures
- Examples of successes
- Moving from a business-unit-by-business-unit control to an established, unified approach to operational risk

Discussion: The changing landscape in the USA

Firmwide Risk Management

- What is it?
- How is that done?
- Overcoming resistance
- Calculation of risk capital

Discussion: the future of risk management

Day 5

Examining different Economic Capital methodologies

- The inputs: the risk exposure calculations including market risk, credit risk, operational risk. As well as cost of capital, default probabilities of counterparties and their recovery rates as well as other factors.
- The outputs: the dollar value of capital assigned and the true costs of funding.
- While some institutions use straightforward factors to transform exposures to capital, other institutions use more complex methods.
- The key to the process is maintaining organizational hierarchies when assigning capital



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General Information

Izzy is president of Super Computer Consulting, Inc. in Northbrook, Illinois. Super Computer Consulting Inc. specializes in complex derivatives including Credit Derivatives. Amongst their areas of expertise are CDOs and credit and operational risk management. Izzy's firm has many consulting clients, amongst them some of the leading Banks, MBS houses and hedge funds. Izzy holds a Ph.D. in Computer Science from Rutgers University and was on the faculty at the University of Toronto. Izzy teaches numerous courses and seminars around the world on a variety of topics. He is also a lecturer at the prestigious mathematics department at the University of Chicago. Izzy's seminars are known for being non mathematical. Instead they combine cutting edge analytics with real world applications and intuitive examples.

Book Published

Izzy is editor and co-author of

“The Handbook of Exotic Options”, Irwin, 1996, ISBN 1-55738-904-7

“Option Embedded Bonds” , Irwin, 1997, ISBN 0-7863-0818-4

“Volatility in the Capital Markets”, Glenlake, 1997, ISBN 1-884964-73-7

“Handbook of Hybrid Securities”, Wiley, 2000, ISBN 0-471-89114-2.

He is author of “Implementing Credit Derivatives”, McGraw Hill, 1999, ISBN 0-07-047237-8

“Pricing, Hedging and Trading Exotic Options”, McGraw Hill, 1999, ISBN 0-07-047236-X .

Software Products

Super Computer Consulting Inc. currently has three software products:

ExoticOp! The exotic options portfolio manager

ConvB++ the convertible bond and hybrid instrument software package

WeatherBox for weather derivatives

Academic Information

B.Sc. in Mathematics and Computer Science, Tel Aviv University 1984

M.Sc. in Computer Science, Rutgers University, 1986

Ph.D. in Computer Science, Rutgers University, 1989

Post Doctoral Fellowship at the University of Toronto, 1989-1991

1997-Current : Lecturer, Graduate program on Mathematical Finance, Mathematics Department, University of Chicago.