

# TREASURY RISK DERIVATIVES BASEL II



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TREASURY

DERIVATIVES

& RISK



# Treasury Risk Crash Course

Treasury risk management requires a fair understanding of pricing, products, modelling and local market challenges. This signature crash course workshop format compresses the content of a quarter semester across a full day course. An integrated skill building exercise that is aimed at professionals who deal with pricing, valuation, risk, policy and reporting issues related to fixed income, capital markets and foreign exchange transactions in the Middle East.

## LEARNING OBJECTIVES

At the end of this workshop the participants will be able to:

- Understand the basics behind calculations of Potential Future Exposure (PFE) and Pre-Settlement Risk (PSR).
- Integrate Value at Risk with Stop loss framework within your limit management framework and integrate them with stop loss limits.
- Learn to use the same models for your internal limit management framework according to your institution's risk appetite and allocated capital.

## WORKSHOP LEVEL

Intermediate and advance users.

## KNOWLEDGE PREREQUISITES

Comfort with basic mathematics, numbers and EXCEL, some familiarity with local treasury products is also required.

## COURSE OUTLINE

Title	Topics
Session One – Advanced Products and Applications	<p>Introduction. Course content, participants &amp; instructor. Understanding the distribution and linking it to policy and reporting frameworks.</p> <p>Core concepts: Volatility, Correlation, Distributions (uniform normal and log normal), Monte Carlo Simulations, Value at Risk, Duration, Convexity and Asset Liability Management.</p> <p>Treasury products review. Money Market, FX, Capital Market. Linking products to Basel II and senior management reporting for Market Risk.</p>
Session Two – Market Risk and Limit Management Framework	<p>Limit Management and the Value at Risk framework. Understanding PSR and PFE. Integrating Value at Risk (VaR) with Stop Loss Limits. Setting limits for MM, FX and Equity products.</p> <p>VaR revisited. Historical Simulation, Variance Covariance, Full Valuation versus Delta Normal models.</p>



# Risk and Derivative Pricing 4 X 4

Risk management and derivative pricing concepts are closely interlinked. As practitioners in the local market we come across a wide range of issues that sit at the intersection of both subjects. A first of its kind event, the 4 x 4 workshop format compresses the content of a semester long course across 4 days. An integrated skill building exercise that is aimed at professionals who deal with pricing, valuation, risk, policy and reporting issues related to structured fixed income and foreign exchange transactions.

## LEARNING OBJECTIVES

At the end of this workshop you will be able to:

- Understand the basis behind pricing and valuation models for both exotic and vanilla fixed income and foreign exchange transactions.
- Optimize risk and pricing frameworks using quantitative and behavioural trends.
- Review risk policy documents for effectiveness and impact.
- Use risk management tools such as Value at Risk within your limit management framework.
- Read, utilize and present risk reports with the same confidence as a quant.

## WORKSHOP LEVEL

Intermediate and advance users.

## KNOWLEDGE PREREQUISITES

Comfort with basic mathematics, numbers and EXCEL, some familiarity with local structures and products is required.

## COURSE OUTLINE

Title	Topics
Session One – Risk – Mindset and Core Concepts	<p>Introduction. Course content, participants &amp; instructor.</p> <p>Understanding the distribution and linking it to policy and reporting frameworks.</p> <p>Core concepts: Volatility, Correlation, Distributions (uniform normal and log normal), Monte Carlo Simulations, Value at Risk, Duration, Convexity and Asset Liability Management.</p> <p>The Black Scholesworld and limit management. Basel II and Senior management reporting for Market Risk.</p>
Session Two – Market Risk and Product Applications	<p>The Nassim Taleb versus Philippe Jorion debate.</p> <p>Historical Simulation, Variance Covariance. Full Valuation versus Delta Normal models. Value at Risk for Fixed Income instruments. The duration and convexity adjustments. Linkages to Greeks.</p> <p>Derivative products –vanilla and exotics. Money Market, FX and Equities. Risk Measurement, Hedging of Positions. Delta and Gamma Hedges.</p> <p>VaR for options and derivatives. Value at Risk interpretation. Value at Risk and economic capital. The VaR to capital charge transformation.</p>
Session Three – Derivative Pricing – Part I	<p>Basic pricing tools. Closed form solutions. Binary Trees. Monte Carlo simulations.</p> <p>Variations for Foreign Exchange products.</p> <p>Pricing exotics and more involved structures.</p>
Session Four – Derivative Pricing – Part II	<p>Interest Rate Swaps, Caps and Floors.</p> <p>Cross Currency Swaps and variations. Valuation Models, Sensitivity Testing.</p> <p>Broken Periods.</p>



# ICAAP – Implementation and Challenges

Serves as a guide to Internal Capital Adequacy Assessment framework implementation with a focus on the calculations required behind the reporting format.

## LEARNING OBJECTIVES

At the end of this workshop, participants will be able to answer the following questions:

- a. What is really required in implementing the ICAAP framework at your bank?
- b. How do we extend stress testing to capital adequacy, economic capital and capital charge calculations?
- c. What are some of the possible options for evaluating strategic risk?
- d. How do you integrate reporting across market, credit, operational risk, liquidity, and credit concentration issues?
- e. Where is the value addition in ICAAP?

## WORKSHOP LEVEL

Intermediate and advance users. This advance level workshop is aimed at teams responsible for implementing ICAAP within banks as well as users responsible for interpreting and applying ICAAP recommendations.

## KNOWLEDGE PREREQUISITES

Familiarity with economic capital, local markets, portfolio management concepts and the Basel II framework.

## COURSE OUTLINE

Title	Topics
Session One – ICAAP: All you ever needed to know in less than 90 minutes	Overview and introduction. Key terms and concepts. Economic Capital and Dynamic Solvency Testing models. ICAAP components. Integrated reporting.
Session Two – Hands on review I	Strategic risk reporting. Sources of data. Modelling approaches Capital allocation, reporting and valuation processes.
Session Three – Hands on review II	Preparing an ICAAP report. Commentary and interpretation.



# Liquidity Management –Tools, Measures and Red Flags

This advanced level workshop serves as a refresher to liquidity management, with an emphasis on traditional models including gap analysis and earnings at risk, stress testing, scenario planning, policy making and simulations.

## LEARNING OBJECTIVES

At the end of this workshop, participants will be able to:

- Measure liquidity and quantify the effectiveness of traditional measurement tools.
- Use scenario based methods, stress testing and simulations to highlight your liquidity risk profile.
- Develop assumptions for testing liquidity risk for Internal Capital Adequacy Assessment.
- Assess and evaluate existing liquidity policies and contingency plans.

## WORKSHOP LEVEL

Intermediate and advance users. This advance level workshop is aimed at individuals responsible for asset liability management and risk management within banks, insurance companies and mutual funds.

## KNOWLEDGE PREREQUISITES

Familiarity with basic liquidity concepts, local markets, portfolio management and the Basel II framework.

## COURSE OUTLINE

Title	Topics
Session One – Liquidity and ALM Models	Overview and introduction. Key terms and concepts. Basic tools – Price and Maturity GAP, MVE and NPV Analysis, Net Interest Income, Earnings at Risk, Cost to Close and Liquidity.
Session Two – Liquidity Management I	Structure, Policies, Tools, Stress tests, ICAAP and Scenario analysis for Liquidity.
Session Three – Liquidity Management II	Hands on simulation and exercises.



# Probability of Default Models – Beyond Regulation

Serves as a Probability of default (PD) calculation refresher as well as reviews intermediate topics and implementation issues related to Probability of default models.

## LEARNING OBJECTIVES

At the end of this workshop, participants will be able to:

- Compare key methods used for PD calculations and work with them.
- Apply these methods within the local environment.
- Work with statistical test of significance to identify and drive key patterns.
- Link PD calculation with internal rating, facility risk rating and capital charge calculation.

## WORKSHOP LEVEL

Intermediate and advance users. This advance level workshop is aimed at individuals responsible for probability of default calculations and risk management within banks, insurance companies and mutual funds.

## KNOWLEDGE PREREQUISITES

Familiarity with economic capital, local markets, portfolio management concepts and the Basel II framework.

## COURSE OUTLINE

Title	Topics
Session One – PDA Models: All you ever needed to know in less than 90 minutes	Overview and introduction. Key terms and concepts. The mortality, KMV and regression approaches. Ground rules and datasets. Structuring a PD study. Common issues and challenges.
Session Two – Hands on Review I	Scoring models in use. Linking scoring models and PD's. Refining models with usage. PD calculation exercise.
Session Three – Hands on Review II	Linking PD's and capital charge calculation. Extending models for anticipated regulation. Applying and interpreting statistical tests.





# Internal Capital Adequacy Assessment

Serves as an introduction to the internal capital adequacy assessment framework being proposed by the central bank as outlined in the Basel II revised framework.

## LEARNING OBJECTIVES

At the end of this workshop, participants will be able to answer the following questions:

- What is the ICAAP framework and how is it applicable to the local market?
- How do we extend stress testing to capital adequacy, economic capital and capital charge calculations?
- What is the business case for ICAAP and what is required to implement it?
- What is required in addition to the work already done on Pillar I?
- The process for including the impact of risk rating systems, portfolio analytics and risk.

## WORKSHOP LEVEL

Intermediate and advance users. This advance level workshop is aimed at individuals responsible for implementing the ICAAP framework.

## KNOWLEDGE PREREQUISITES

Familiarity with economic capital, local markets, portfolio management concepts and the Basel II framework.

## COURSE OUTLINE

Title	Topics
Session One – 9 concepts in 90 minutes	Introduction. Course objectives. Format. Statistical distributions. Fat Tails and asymmetry. Volatility. Return series. Log normal returns. Market data and adjustments to fixed income and capital markets data. Probabilities and applications.
Session Two – Value at Risk Debate	The Nassim Taleb versus Philippe Jorion debate. Comparing Historical Simulation, Variance Covariance, Monte Carlo simulation. Results and trends from local market data. Full Valuation versus Delta Normal models. Value at Risk for Fixed Income instruments. The Duration and Convexity adjustment.
Session Three – VaR Applications	Value at Risk interpretation. Value at Risk, Basel II and Economic capital. The VaR to capital charge transformation. Unexpected loss. Risk budgeting.



# Value at Risk \_ Crash Course

This intermediate level workshop serves as a Value at Risk refresher and reviews intermediate topics and implementation issues related to Value at Risk.

## LEARNING OBJECTIVES

At the end of this workshop, participants will be able to:

- Assess the impact of methods and parameter choices on VaR number.
- Translate VaR numbers into capital charge requirements.
- Evaluate the magnitude of capital savings or additional capital requirements by comparing standardized approach capital charge with VaR based capital charge using local market data.
- Extend the VaR framework for economic capital calculations.

## WORKSHOP LEVEL

Intermediate and advance users. This advance level workshop is aimed at individuals responsible for capital allocation and risk management within banks, insurance companies and mutual funds.

## KNOWLEDGE PREREQUISITES

Familiarity with economic capital, local markets, portfolio management concepts and the Basel II framework.

## COURSE OUTLINE

Title	Topics
Session One – 9 concepts in 90 minutes	Introduction. Course objectives. Format. Statistical distributions. Fat Tails and asymmetry. Volatility. Return series. Log normal returns. Market data and adjustments to fixed income and capital markets data. Probabilities and applications.
Session Two – Value at Risk Debate	The Nassim Taleb versus Philippe Jorion debate. Comparing Historical Simulation, Variance Covariance, Monte Carlo simulation. Results and trends from local market data. Full Valuation versus Delta Normal models. Value at Risk for Fixed Income instruments. The Duration and Convexity adjustment.
Session Three – VaR Applications	Value at Risk interpretation. Value at Risk, Basel II and Economic capital. The VaR to capital charge transformation. Unexpected loss. Risk budgeting.



# Economic Capital, Limit Management and Basel II: Application and Practice

The Economic Capital debate triggered by Basel II requires a mind shift that needs to flow all the way down to current limit management frameworks. Simply extending the existing structure does not lead to full compliance or value creation. The objective is to introduce active capital management and monitoring tools and apply them in a local market setting in line with the Basel II guidelines.

## LEARNING OBJECTIVES

At the end of this workshop, participants will be able to:

- Differentiate between various capital management and monitoring tools.
- Design tiered risk limit systems in line with market risk policies.
- Evaluate the impact of risk limits on performance benchmarks.
- Create exception tracking mechanisms.

## WORKSHOP LEVEL

Advance users. This advance level workshop is aimed at individuals responsible for capital allocation and management within banks, insurance companies and mutual funds. This would include group heads for risk, treasury, finance and strategic initiatives.

## KNOWLEDGE PREREQUISITES

Familiarity with Value at Risk, economic capital, local markets, portfolio management concepts and the Basel II framework.

## COURSE OUTLINE

Title	Topics
Session One – 9 concepts in 90 minutes	Introduction. Course objectives. Format. Economic capital. Regulatory and internal capital guidelines. Active Capital Management toolkit. RAROC defined. Performance measurement benchmarks. Limit monitoring tools.
Session Two – Limit Management Framework	A market risk case study.
Session Three – Limit Management Framework II	A market risk case study – continued. Review, lessons learnt, wrap up and closure.



## Basel II \_ Myths, Challenges & Question Marks

Designed as a senior management retreat on Basel II, this limited seating, one day workshop serves as a 6 hour crash course on Basel II for Chief Executives, Chief Financial Officers, Country Risk Officers, Credit Administration Heads, Treasury Heads, Basel II Coordinators and Board Risk Committee members.

### LEARNING OBJECTIVES

By the end of the workshop participants would be able to answer questions on:

- What are Basel II implications for capital allocation, profitability measurement and balance sheet growth?
- Where do RAROC, Basel II and product selection decisions converge?
- Do transfer pricing and gap management mechanisms at your institution need an overhaul?
- How can effective capital and risk management create a sustainable competitive advantage?

### WORKSHOP LEVEL

Intermediate and advance users.

### KNOWLEDGE PREREQUISITES

Familiarity with financial markets, banking industry and Basel II; ability to work with Microsoft EXCEL and an understanding of risk management environment.

### COURSE OUTLINE

Title	Topics
Session One – Base II: All you ever needed to know in less than 90 minutes	Introductions and course overview. Beyond the basics. Capital Management and Risk Based pricing. Industry overview – a quick look at capital adequacy and MCR numbers across the banking industry. Basel II – Credit, Operational and Market Risk capital frame works. Myths and reality.
Session Two – Capital Allocation and Balance Sheet Growth	Risk weights and number crunching. The Capital allocation challenge. Optimizing capital allocation for balance sheet growth. Domestic market constraints and challenges. Balancing growth and profitability. Internal assessment versus regulatory reporting.
Session Three – Transfer Pricing and Value Creation	How hard does your pool rate work? Pool rates and Basel II? A term structure of pool rates. Balance sheet gap management – a tale of two maturities. The Corporate and Treasury death match. Where is the value in Risk Management? The business case for your Country Risk Office. Sustainable competitive advantage – loan pricing and Basel II.



# Introduction to Derivative Products

An introductory course aimed at banking, corporate, treasury and sales teams that reviews intermediate and advance derivative products with a focus on marketing and sales applications. Participants work with product, sales, pricing and risk concepts applicable to derivative markets.

## LEARNING OBJECTIVES

At the end of this workshop the participants will be able to:

- Differentiate between the different types of derivative instruments and their primary applications.
- Work with vanilla products and four specific transaction types across interest rates, currencies, commodities and capital market accounts.
- Review basic pricing concepts needed to appreciate exotic derivative products.
- Explain the product variations available across the interest rate derivative product family.
- Work with counterparty limits, pre settlement risk and potential future exposure numbers.

## WORKSHOP LEVEL

Intermediate and advance users.

## KNOWLEDGE PREREQUISITES

Corporate Banking and Treasury products.

## COURSE OUTLINE

Title	Topics
Session One – Introduction	<p>Introduction to core concepts and terminology including:</p> <ul style="list-style-type: none"><li>• Derivative products</li><li>• Volatility</li><li>• Correlation</li><li>• Distributions</li><li>• Monte Carlo simulations</li><li>• Value at Risk</li><li>• Duration</li><li>• Convexity</li><li>• Optionality</li><li>• Asset Liability Management</li></ul> <p>Understanding transaction drivers and customer motivations.</p> <p>Roles within derivative markets.</p> <p>Risk – Introduction to application and cases.</p>
Session Two – Introduction to Products & Applications	<p>Vanilla products:</p> <ul style="list-style-type: none"><li>• Forwards</li><li>• Futures</li><li>• Call and Puts</li></ul> <p>Commodities – Oil and Gold Currencies – Imports and Exports Interest rates – Funding and Financing Capital Markets – Portfolio Management</p>



# Introduction to Treasury Products

A two day introduction to treasury products, pricing, operations and risk for non-treasury resources. The course aims to fill in knowledge gap for teams that interact and interface with treasury and can benefit from an insider's look at how treasury desks quote, manage and execute fixed income, foreign exchange and capital market transactions.

## LEARNING OBJECTIVES

At the end of this workshop the participants will be able to:

- Understand the three primary treasury desks, their function and their primary products.
- Explain how a transaction flows through treasury operations and the possible problems and issues that occur when exceptions are recorded.
- Review conventional and traditional treasury product families covering transactions across Fixed Income, FX and Capital Markets.

## WORKSHOP LEVEL

Basic and intermediate users.

## KNOWLEDGE PREREQUISITES

Banking operations.

## COURSE OUTLINE

Title	Topics
Session One – Introduction	<div> <p>The Treasury Function</p> <p>Trade Flows (FX desk)</p> <p>Trading, Investment &amp; Portfolio Management</p> <p>Proprietary Trading</p> <p>Asset Liability Management</p> <p>Liquidity Management</p> <p>Treasury Markets</p> <p>Foreign Exchange</p> <p>Fixed Income / Money Market</p> <p>Capital Markets</p> <p>The Treasury Function Operations</p> <p>Front Office</p> <p>Middle Office</p> <p>Back Office</p> </div> <div> <p>Related Terminologies</p> <p>Four eyes</p> <p>Confirmation</p> <p>Settlement</p> <p>Dealing System</p> <p>Price discovery</p> <p>Rate reasonability</p> <p>Limit Management</p> <p>Middle Office function</p> <p>Risk Policies</p> <p>Counterparty Limits</p> </div>
Session Two – Products and Applications	<p>Trading exercise</p> <p>Client - Relationship Manager</p> <p>RM – Treasury Dealer</p> <p>Treasury Dealer – Market</p> <p>Quote, Confirm, Execute, Settle</p> <p>Settlement exercise</p> <p>Paper work, Limits, Counterparty confirmation, Back office verification &amp; Validation</p> <p>Customer quote</p> <p>Rate quote, spread and margins</p> <p>Treasury Operations</p> <p>Treasury hierarchy (Chief Dealer, Interbank, ALM, FX, MM)</p> <p>Limit Breach, Exception processing</p> <p>Reserve Management (Cash, Liquidity)</p>



## Introduction to Treasury Products

Title	Topics
Session Three – Conventional and Traditional Treasury Product Families	Product Families Conventional treasury products Vanilla products Forwards, Futures, Options (Calls and Puts), Swaps (Interest Rates), Caps and Floors Zero cost collars Exotics products
Session Four – Advance Products and Applications	Structured Products Cross Currency Swaps Participating Forwards Equity Linked Notes Capital Protected / Capital Guaranteed Notes Commodity Linked Notes Range Accruals Credit products Credit Default Swaps Total Return Swaps CDOs Customer Default and Counter Party Limits Pre-settlement risk (PSR) and Potential Future Exposure (PFE)



# Derivative Pricing: Interest Rate Products

## LEARNING OBJECTIVES

1. Construct the par, zero coupon and forward curve using market data.
2. Price Interest Rate Swaps and Forward Rate Agreements using the forward curve.
3. Price Interest Rate Caps, Floors, Inverse Floaters & Range Floaters using the forward curve.
4. Review of credit derivatives, buy and sell side motivations & local market applications.
5. Develop a conceptual understanding of interest rate models, alternative pricing models, market calibration and cross checks

## WORKSHOP LEVEL

- Intermediate and advance users.

## KNOWLEDGE PREREQUISITES

Comfort with basic mathematics, numbers and EXCEL, some familiarity with local structures and products is required.

## COURSE OUTLINE

Title	Topics
Session 1: Introduction	<p>Introduction to core concepts and terminology including</p> <ul style="list-style-type: none"><li>• The forward market – mindset, approaches, applications</li><li>• The par curve, zero curve and forward curve</li><li>• From par rates to forward rates</li><li>• Bootstrapping process and walk through</li><li>• Pricing framework and process</li></ul>
Session 2 : Building curves and pricing structures	<ul style="list-style-type: none"><li>• Interest rate curves and Vanilla product valuation &amp; MTM:</li><li>✓ Forward Rate Agreements</li><li>✓ Interest Rate Swaps</li><li>✓ Solving for a Swap rate</li><li>✓ Index amortizing swaps</li><li>✓ Broken period valuation</li></ul>
Session 3: Pricing more advance structures using the same framework	<ul style="list-style-type: none"><li>• The Black Scholes pricing formula</li><li>• Caps and Floors</li><li>• Caplets and Floorlets</li><li>• Pricing Caps and Floors, Range Accrual Notes, Commodity Linked Notes, Equity Linked Notes</li></ul>
Session 4 – Exchange Rate Risk	<ul style="list-style-type: none"><li>• Cross Currency Swaps Model extensions</li><li>• Qualifications, caveats and model risk</li><li>• Sensitivity testing</li></ul>





# Derivative Pricing: FX Products

A two day introduction to treasury products, pricing, operations and risk for non-treasury resources. The course aims to fill in knowledge gap for teams that interact and interface with treasury and can benefit from an insider's look at how treasury desks quote, manage and execute fixed income, foreign exchange and capital market transactions.

## LEARNING OBJECTIVES

At the end of this workshop the participants will be able to:

1. Understand the three primary treasury desks, their function and their primary products.
2. Explain how a transaction flows through treasury operations and the possible problems and issues that occur when exceptions are recorded.
3. Review conventional and traditional treasury product families covering transactions across Fixed Income, FX and Capital Markets.

## WORKSHOP LEVEL

- Intermediate and advance users.

## KNOWLEDGE PREREQUISITES

Banking operations. All participants are requested to arrange Laptops with a functional version of Microsoft Excel.

## COURSE OUTLINE

Title	Topics
Session 1: Introduction	<ul style="list-style-type: none"> <li>• The Treasury Function <ul style="list-style-type: none"> <li>✓ Trade Flows (FX desk)</li> <li>✓ Trading, Investment &amp; Portfolio Management</li> <li>✓ Proprietary Trading Asset Liability</li> <li>✓ Management Liquidity Management</li> </ul> </li> <li>• Treasury Markets <ul style="list-style-type: none"> <li>✓ Foreign Exchange</li> <li>✓ Fixed Income / Money Market</li> <li>✓ Capital Market</li> </ul> </li> <li>• The Treasury Function Operations <ul style="list-style-type: none"> <li>✓ Front Office</li> <li>✓ Middle Office</li> <li>✓ Back Office</li> </ul> </li> <li>• Related Terminologies <ul style="list-style-type: none"> <li>✓ Four eyes</li> <li>✓ Confirmation</li> <li>✓ Settlement</li> <li>✓ Dealing System</li> <li>✓ Price discovery</li> </ul> </li> <li>• Rate reasonability</li> <li>• Limit Management</li> <li>• Middle Office function</li> <li>• Risk Policies</li> <li>• Counterparty Limits</li> </ul>
Session 2 :Product Applications	<ul style="list-style-type: none"> <li>• Trading exercise <ul style="list-style-type: none"> <li>✓ Client - Relationship Manager</li> <li>✓ RM - Treasury Dealer</li> </ul> </li> <li>• Settlement exercise <ul style="list-style-type: none"> <li>✓ Paper work, Limits, Counterparty confirmation, Back office verification &amp; Validation</li> </ul> </li> <li>• Customer quote <ul style="list-style-type: none"> <li>✓ Rate quote, spread and margins</li> </ul> </li> <li>• Treasury Operations <ul style="list-style-type: none"> <li>✓ Treasury hierarchy (Chief Dealer, Inter Bank, ALM, FX, MM)</li> <li>✓ Limit Breach, Exception processing</li> <li>✓ Reserve Management (Cash, Liquidity)</li> </ul> </li> <li>• Treasury Dealer - Market Quote, Confirm, Execute, Settle</li> </ul>



## Derivative Pricing: FX Products

Title	Topics
Session 3: Conventional and Traditional Treasury Product Families	<ul style="list-style-type: none"><li>• Product FamiliesConventional treasury productsVanilla products<ul style="list-style-type: none"><li>✓ Forwards, Futures, Options (Calls and Puts), Swaps (Interest Rates), Caps and Floors</li><li>✓ Zero cost collars</li></ul></li><li>• Exotics products</li></ul>
Session 4: Advance Products and Applications	<ul style="list-style-type: none"><li>• Structured Products<ul style="list-style-type: none"><li>✓ Cross Currency Swaps</li><li>✓ Participating Forwards</li><li>✓ Equity Linked Notes</li><li>✓ Capital Protected / Capital Guaranteed Notes</li><li>✓ Commodity Linked Notes</li><li>✓ Range Accruals</li></ul></li><li>• Credit products<ul style="list-style-type: none"><li>✓ Credit Default Swaps</li><li>✓ Total Return Swaps</li><li>✓ CDOs</li><li>✓ Customer Default and Counter Party Limits</li><li>✓ Pre-settlement risk (PSR) and Potential Future Exposure (PFE)</li></ul></li></ul>



# Interest Rate Models: Forecasting Interest Rates and application

The workshop is aimed at treasury, risk and fixed income investors who use interest rate forecasting tools for arbitrage, ALM, risk or credit policy decisions. Teaching methodology is based on intensive hands on model building and application cases.

## LEARNING OBJECTIVES

The workshop covers four different families of interest rate models starting with the simplest CIR (Cox, Ingersoll & Ross) and finishing up with the multi-factor HJM model. We then look at applications of the same models in Asset Liability Management, Fixed Income Arbitrage, monetary policy announcements and predicting unexpected interest rate shocks. A final session extends the analysis to a macro economic model of the economy using core interest rate drivers and Monte Carlo simulation.

At the end of this workshop the participants will be able to:

1. Use models to identify fixed income arbitrage opportunities in treasury term structure
2. Build basic and advance interest rate models in excel for forecasting and extrapolating interest rates across the full range of maturity tenors
3. Review the impact of external shocks (such as oil prices) on domestic interest rate environment and monetary policy
4. Review interest rate inputs for ALCO meetings as well as ALM models.

The packaged workshop represents an integrated skill building exercise that combines concepts with practical hands on application and is aimed at professionals who deal with pricing, valuation and portfolio management issues related to fixed income markets in Pakistan.

## WORKSHOP LEVEL

- Intermediate and advance users.

## KNOWLEDGE PREREQUISITES

Some familiarity with interest rate modeling required.

## COURSE OUTLINE

Title	Topics
Session 1: The Interest Rate Modeling Crash Course in 90 minutes	<ul style="list-style-type: none"> <li>• The term structure, Zero and Forward Rates.</li> <li>• Building Static Interest Rate Models.</li> <li>• Bootstrapping Zero and Forward Curves.</li> <li>• Using interpolation and interpreting Forward Curve.</li> <li>• Interest Rate Model Families.</li> <li>• Cox, Ingersoll and Ross (CIR), Black, Derman and Toy (BDT) and the multifactor HJM.</li> <li>• Building models using macro factors.</li> </ul>
Session 2 : Case Study A: CIR and ALM – Generating Rates and re-pricing	<ul style="list-style-type: none"> <li>• Building a simple interest rate generator and linking it to the ALM model.</li> <li>• Revaluing loan book and collateral impairment.</li> <li>• Linking ALM inputs with model drivers.</li> <li>• Calibrating CIR for domestic interest rate data.</li> </ul>
Session 3 : Case Study B: Term Structure model and BDT: When issued pricing	<ul style="list-style-type: none"> <li>• Building BDT (Black, Derman and Toy).</li> <li>• Filling in the blanks for intermediate tenor rates.</li> <li>• Using BDT to price when issued securities and identifying opportunities for fixed income arbitrage.</li> </ul>
Session 4 : Case Study C: Forecasting forward rates and HJM	<ul style="list-style-type: none"> <li>• Forward rates and the multifactor HJM model.</li> <li>• Using HJM to price interest rate derivatives.</li> <li>• Building the HJM model.</li> </ul>



## Interest Rate Models: Forecasting Interest Rates and application

Title	Topics
Session 5 : Case Study C: Forecasting forward rates and HJM	<ul style="list-style-type: none"><li>• Multifactor model applications continued.</li><li>• Building and testing the HJM model. PCA Analysis and HJM calibration.</li></ul>
Session 6: Case Study D: Simulating the Economy	<ul style="list-style-type: none"><li>• Building a macro economic model for simulating a national economy and monetary policy decisions.</li><li>• Identifying drivers.</li><li>• Implementing the model.</li><li>• Interpreting results.</li><li>• Review, wrap up and closure.</li></ul>

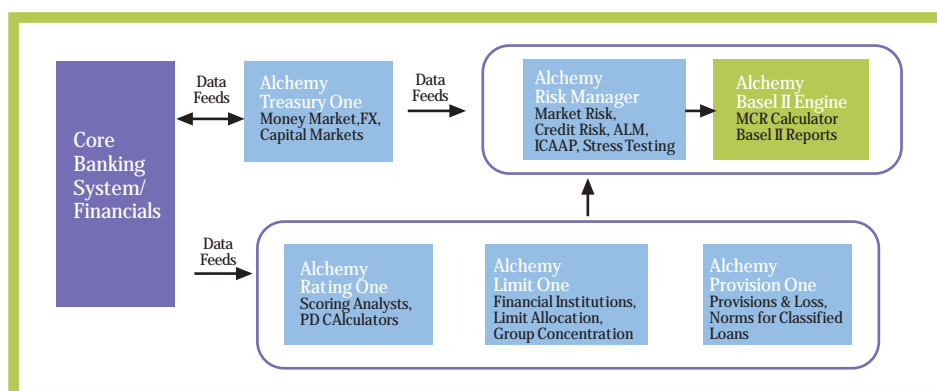
# About Alchemy

Founded in 2003, Alchemy has grown to be one of the largest Enterprise risk and Actuarial firms in the region with a portfolio of several blue chip customers. Alchemy's enterprise, treasury and Basel II risk solutions have all been built over the last 6 years with feedback from International and local industry user groups.

Alchemy's product offerings include Risk Management and Treasury Management, Obligor and Facility Risk Rating platforms, Probability of Default, Loss Norms and Provision calculators, Value at Risk engines, custom financial model development and audits, interactive workshops, risk and actuarial advisory, Basel II capital charge calculation and reporting solutions for banks, insurance companies and portfolio managers.

Alchemy has won multiple product recognition awards including the MIT Business Acceleration Plan Runner's up Award, the PASHA ICT Award for Best Financial Application as well as the Asia Pacific ICT Finalist for the Financial Application category. Our products have been show cased in Pakistan, Thailand, China, Malaysia, Singapore, Macau and the Middle East. Alchemy's Basel II compliant market and credit risk platform includes the following products:

- a) Alchemy TreasuryOne, a treasury automation and management solution that captures deals, implements pre-trade limit checks, provides middle office reporting and control, MIS, and SBP regulatory reporting and performs back office settlements across required asset classes.
- b) Alchemy LimitOne, a counterparty limit generating application that factors in financial analysis, subjective attributes, market indicators, group concentrations and Prudential Regulations for Interbank counterparties.
- c) Alchemy ProvisionOne, an add-on module that computes provisions and loss norms for classified loans based on collateral adjustments and prudential requirements.
- d) Alchemy Risk Manager, an enterprise risk management solution enabling customers to analyze, manage, stress test and report their Credit, Market and Operational Risk coverage to central banks.
- e) A Basel II compliant report generator with more than 100 reports for meeting Basel II reporting requirements, and ensuring compliance with circulars relating to risk reporting.
- f) Alchemy RatingOne, an Entity Obligor Risk Rating (ORR) and Facility Risk Rating (FRR) that uses account level client data and repayment experience to calculate probability of default, loss norms and provisions.



The six products capture a broad array of additional functions, which include ALM (Asset liability management), Back Testing, portfolio benchmarking, VaR (Value at Risk), Basel Pillar I and Pillar II reporting.

## Trainer Profile



### Jawwad Ahmed Farid

Jawwad Ahmed Farid is a Fellow Society of Actuaries (Chicago), a MBA from Columbia Business School (New York City) and a computer science graduate. During the last 19 years, he has worked as a consultant in North America, Pakistan and the United Kingdom with a number of blue chip clients including Hartford Life, Aegon, American General, Goldman Sachs, ING, Manu Life, Merrill Lynch, Met Life, Sun America, Nationwide, Sumitomo Mitsui Bank, Sun Life of Canada, Pacific Life, AllState, Fidelity Investments, Transamerica, Skandia, GE Financial Assurance, AXA Equitable and Washington Mutual Bank.

Jawwad's core areas of expertise include Asset/Risk Management, Investments, Product Development & the Financial Services Back Office. Jawwad blends a rare combination of risk management, information systems, international standards, business and product development skill set side by side with his actuarial expertise.

He is the author of three books on Entrepreneurship (**Reboot**), Commodity Markets (**Understanding Commodities Risk**) and Risk Management (**Risk Application and Frameworks**).

As an investment advisor Jawwad has advised a 3 billion US\$ dollar life insurance fund in Pakistan on allocation and bid patterns for 10, 20 and 30 year bonds, a 30 million dollar Middle East fund on their ALM mismatch and fixed income strategy, a 10 million dollar fund on asset allocation and equity market timing in Pakistan. He has also worked with the securities regulator on assessing the state of the corporate bond market as well as issued valuation opinions on cross currency swaps, interest rate swaps, caps, floors, participating forwards and contingent liabilities for Exchange Guarantee Funds in the region.

Jawwad has worked directly as a founder, founding team member, mentor and advisor at multiple startups including two green field life insurance companies, multiple technology product businesses, financial services consulting operations, risk and investment advisory businesses, product focused distribution as well as micro insurance, micro pensions and micro finance startups.

In addition to being a PASHA CEC member and Treasurer he has also served as a judge at the Asia Pacific ICT Awards in Macau, Singapore, Kuala Lumpur and Jakarta as well as at PASHA ICT Award in 2006, 2007, 2008, 2009, 2010. He currently serves as member of the oversight board for the PASHA Social Innovation Fund.

His regional client list includes First Gulf Bank, Riyad Bank, Ministry of Finance Malaysia, May Bank, Dubai Islamic Bank, Noor Islamic Bank, Dubai Bonds, Deutsche Bank, SP Jain, Marcus Evans, LSW International, State Bank of Pakistan, National Bank of Pakistan, Muslim Commercial Bank, Crescent Commercial, MyBank, Dawood Islamic Bank, KASB Bank, United Bank Limited, Pak-Kuwait Investment, Saudi Pak Commercial Bank, ABN AMRO, State Life Insurance, Dawood Family Takaful, Asia Health Care, Adamjee Insurance, Shell Pakistan, and International General Insurance.