

**FINANCIAL DERIVATIVES  
PART I  
PROGRAM**

# **Outline for Financial Derivatives Part I Program, a 3-Day Program**

## **Chapter 0: Historical Background**

## **Chapter 1: Some Essential Mathematical Concepts**

- 1.1 Definition And Examples Of Derivatives
  - 1.1.1 Definition
  - 1.1.2 Examples
- 1.2 Some Essential Mathematical Concepts
  - 1.2.1 Probability Theory
  - 1.2.2 Permutations and Combinations
  - 1.2.3 Mathematical Expectation
- 1.3 Time Value Of Money
  - 1.3.1 Definition
  - 1.3.2 Future Value of Money
  - 1.3.3 Present Value of Money
- 1.4 Concept Of Fair Value And Option Premium
- 1.5 Introduction To Term Structure
- 1.6 Building a Yield Curve

## **Chapter 2: Some Basic Interest Rate Derivative Instruments and Their Applications**

- 2.1 Different Types Of Interest Rates
  - 2.1.1 Cash Rates
  - 2.1.2 Spot and Forward Interest Rates
- 2.2 Interest Rate Derivatives
  - 2.2.1 Interest Rate Futures
  - 2.2.2 Swaps
    - Interest Rate Swaps
    - Cross Currency Swaps
- 2.3 Valuation Of Interest Rate Swaps
- 2.4 Building The Yield Curve
- 2.5 Valuation Of Cross Currency Swaps

- 2.6 Other Interest Rate Derivatives
  - 2.6.1 Variations of Basic Swaps
  - 2.6.2 Caps and Floors
  - 2.6.3 Swaptions
  - 2.6.4 Limited Caps and Floors
- 2.7 Sensitivity Analysis - The Greek Alphabets
- 2.8 Hands-on Session Using The PERMIT<sup>®1</sup> System

### **Chapter 3: Some Basic Currency Derivative Instruments And Their Applications**

- 3.1 Graphical Representations of Currency Risks
- 3.2 Currency Forward Contracts
  - 3.2.1 Definitions
  - 3.2.2 Currency Forward Buy Contract
  - 3.2.3 Currency Forward Sell Contract
- 3.3 Currency Option Contracts
  - 3.3.1 Definitions
  - 3.3.2 Types of Options
- 3.4 Pricing Of Options
  - 3.4.1 Black-Scholes Option Pricing Model
  - 3.4.2 Binomial Option Pricing Model
  - 3.4.3 Limiting Case of the Binomial Option Pricing Model
  - 3.4.4 Put-Call Parity
  - 3.4.5 Volatility Determination
  - 3.4.6 The Volatility Smile Curve
- 3.5 Some Common Options Terminologies
- 3.6 Time Value Of Options
- 3.7 Some Vanilla Option Structures
- 3.8 Sensitivity Analysis And The Greek Alphabets
  - 3.8.1 Definitions
  - 3.8.2 Calculating the Greek Alphabets
- 3.9 Hands-on Session Using The PERMIT<sup>®</sup> System

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<sup>1</sup> PERMIT<sup>®</sup> which is an acronym for PI ETA Risk Management Information Technology, is a registered trademark of PI ETA Consulting Company.

## Program Facilitator

Dr. Jeffrey C. K. Lim, Ph.D., C.Sci., C.Math., FIMA, FRM, PRM

Dr. Jeffrey C. K. Lim, certified Financial Risk Manager (FRM<sup>2</sup>) and certified Professional Risk Manager (PRM<sup>3</sup>), is currently the Managing Director of PI ETA Consulting Company, a Treasury & Financial Risk Management Consulting Company.

A Chartered Scientist (C.Sci.<sup>4</sup>), a Chartered Mathematician (C.Math.<sup>5</sup>) and an elected Fellow of the Institute of Mathematics and Its Applications (IMA), U.K. (FIMA), Jeff earned his Ph.D. in Stochastic Financial Modeling from the University of Cambridge in England. Jeff's research interest at Cambridge was in the area of Arbitrage Opportunities occurring in the Mispricing of Financial Options, and his original research culminated in the publication of his doctoral dissertation entitled: "Multi-period Mean-Variance Option Portfolio Strategies".

Jeff was an authorized Securities & Financial Derivatives Representative in London, having been certified by The Securities and Futures Authority (SFA) in England, where he started his career as a Derivatives Analyst with Nomura International in London, England. He subsequently joined NatWest Markets from London to become its Head of Currency Structured Products for South and South-East Asia. Jeff then moved to American Express Bank to become its Director of Structured Products, prior to assuming his current position.

Jeff has also contributed to the development and enhancement of talent and infrastructure for Singapore's financial center as a guest Professor at the National University of Singapore's Center for Financial Engineering, where he was responsible for the curriculum of its Master of Science degree program's core modules in Financial Derivatives and Treasury Management.

At PI ETA Consulting Company, Jeff was Principal Inventor in two of the Patents that the company currently holds – one in Treasury & Financial Risk Management Systems, and the other in Knowledge Management Systems.

Professionally, Jeff is a Fellow of both the Global Association of Risk Professionals (GARP), U.S.A. and the Professional Risk Managers International Association (PRMIA), U.S.A. He is also a Fellow of the Cambridge Philosophical Society, U.K.. Jeff is also honoured to be a Fellow of The Cambridge Commonwealth Society, U.K., having been previously awarded the Cambridge Commonwealth Trust and the Shell Group of Companies Doctoral Research Scholarship.

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<sup>2</sup> The *Financial Risk Manager* (FRM) designation is awarded by The Global Association of Risk Professionals (GARP), U.S.A.

<sup>3</sup> The *Professional Risk Manager* (PRM) designation is awarded by The Professional Risk Managers International Association (PRMIA), U.S.A.

<sup>4</sup> The *Chartered Scientist* (C.Sci.) designation is awarded by The Science Council, U.K.

<sup>5</sup> The *Chartered Mathematician* (C.Math.) designation is awarded by The Institute of Mathematics and Its Applications (IMA), U.K.