STUDY SESSION 12

Fixed Income

Valuation Concepts

This study session covers essential knowledge and skills needed for the valuation of fixed-income investments. The first reading discusses the term structure of interest rates and interest rate dynamics. The second reading addresses arbitrage-free valuation of fixed-income securities.

READING ASSIGNMENTS

Reading 35	The Term Structure and Interest Rate Dynamics by Thomas S.Y. Ho, PhD, Sang Bin Lee, PhD, and Stephen E. Wilcox, PhD, CFA
Reading 36	The Arbitrage-Free Valuation Framework by Steven V. Mann, PhD

LEARNING OUTCOMES

READING 35. THE TERM STRUCTURE AND INTEREST RATE DYNAMICS

The candidate should be able to:

a describe relationships among spot rates, forward rates, yield to maturity, expected and realized returns on bonds, and the shape of the yield curve;

b describe the forward pricing and forward rate models and calculate forward and spot prices and rates using those models;

c describe how zero-coupon rates (spot rates) may be obtained from the par curve by bootstrapping;

- **d** describe the assumptions concerning the evolution of spot rates in relation to forward rates implicit in active bond portfolio management;
- **e** describe the strategy of riding the yield curve;
- **f** explain the swap rate curve and why and how market participants use it in valuation;
- **g** calculate and interpret the swap spread for a given maturity;
- **h** describe the Z-spread;
- **i** describe the TED and Libor–OIS spreads;
- **j** explain traditional theories of the term structure of interest rates and describe the implications of each theory for forward rates and the shape of the yield curve;
- **k** describe modern term structure models and how they are used;
- **l** explain how a bond's exposure to each of the factors driving the yield curve can be measured and how these exposures can be used to manage yield curve risks;
- **m** explain the maturity structure of yield volatilities and their effect on price volatility.

READING 36. THE ARBITRAGE-FREE VALUATION FRAMEWORK

The candidate should be able to:

- **a** explain what is meant by arbitrage-free valuation of a fixed-income instrument;
- **b** calculate the arbitrage-free value of an option-free, fixed-rate coupon bond;
- **c** describe a binomial interest rate tree framework;
- **d** describe the backward induction valuation methodology and calculate the value of a fixed-income instrument given its cash flow at each node;
- **e** describe the process of calibrating a binomial interest rate tree to match a specific term structure;
- **f** compare pricing using the zero-coupon yield curve with pricing using an arbitrage-free binomial lattice;
- **g** describe pathwise valuation in a binomial interest rate framework and calculate the value of a fixed-income instrument given its cash flows along each path;
- **h** describe a Monte Carlo forward-rate simulation and its application.