

Derivative Instruments

Valuation and Strategies

This study session examines derivative investments: forwards and options. It focuses on pricing, valuation, and strategies.

READING ASSIGNMENTS

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| Reading 40 | Pricing and Valuation of Forward Commitments
by Robert E. Brooks, PhD, CFA, and Barbara Valbuzzi, CFA |
| Reading 41 | Valuation of Contingent Claims
by Robert E. Brooks, PhD, CFA, and David Maurice Gentle,
MEc, BSc, CFA |
| Reading 42 | Derivatives Strategies
by Robert A. Strong, PhD, CFA, and Russell A. Rhoads, CFA |

LEARNING OUTCOMES

READING 40. PRICING AND VALUATION OF FORWARD COMMITMENTS

The candidate should be able to:

- a** describe and compare how equity, interest rate, fixed-income, and currency forward and futures contracts are priced and valued;
- b** calculate and interpret the no-arbitrage value of equity, interest rate, fixed-income, and currency forward and futures contracts;

- c describe and compare how interest rate, currency, and equity swaps are priced and valued;
- d calculate and interpret the no-arbitrage value of interest rate, currency, and equity swaps.

READING 41. VALUATION OF CONTINGENT CLAIMS

The candidate should be able to

- a describe and interpret the binomial option valuation model and its component terms;
- b calculate the no-arbitrage values of European and American options using a two-period binomial model;
- c identify an arbitrage opportunity involving options and describe the related arbitrage;
- d describe how interest rate options are valued using a two-period binomial model;
- e calculate and interpret the value of an interest rate option using a two-period binomial model;
- f describe how the value of a European option can be analyzed as the present value of the option's expected payoff at expiration;
- g identify assumptions of the Black–Scholes–Merton option valuation model;
- h interpret the components of the Black–Scholes–Merton model as applied to call options in terms of a leveraged position in the underlying;
- i describe how the Black–Scholes–Merton model is used to value European options on equities and currencies;
- j describe how the Black model is used to value European options on futures;
- k describe how the Black model is used to value European interest rate options and European swaptions;
- l interpret each of the option Greeks;
- m describe how a delta hedge is executed;
- n describe the role of gamma risk in options trading;
- o define implied volatility and explain how it is used in options trading.

READING 42. DERIVATIVES STRATEGIES

The candidate should be able to:

- a describe how interest rate, currency, and equity swaps, futures, and forwards can be used to modify risk and return;
- b describe how to replicate an asset by using options and by using cash plus forwards or futures;
- c describe the investment objectives, structure, payoff, and risk(s) of a covered call position;
- d describe the investment objectives, structure, payoff, and risks(s) of a protective put position;
- e calculate and interpret the value at expiration, profit, maximum profit, maximum loss, and breakeven underlying price at expiration for covered calls and protective puts;

- f** contrast protective put and covered call positions to being long an asset and short a forward on the asset;
- g** describe the investment objective(s), structure, payoffs, and risks of the following option strategies: bull spread, bear spread, collar, and straddle;
- h** calculate and interpret the value at expiration, profit, maximum profit, maximum loss, and breakeven underlying price at expiration of the following option strategies: bull spread, bear spread, collar, and straddle;
- i** describe uses of calendar spreads;
- j** identify and evaluate appropriate derivatives strategies consistent with given investment objectives.