APPENDIX D

Glossary of Derivatives-Related Terms[1]

accrued interest The amount of coupon interest income accumulated on a coupon-bearing bond since the last coupon payment date.

all-or-none (AON) order An order that must be filled in its entirety or not at all.

American option See *American-style option*.

American-style option An option that can be exercised at any time up to and including the expiration day.

amortizing swap A swap whose notional principal decreases through time.

anticipatory hedge A hedge placed in anticipation of making a transaction in spot market on future date (e.g., a breakfast cereal producer may want to lock in the price of the grain that he needs three months from now).

arbitrage The simultaneous purchase or sale of perfect substitutes at different prices.

arbitrager Someone who engages in arbitrage.

arbitrageur Same as arbitrager.

Asian option An option whose payoff is determined by the average price of asset during specified period.

ask price The price at which a market maker stands ready to sell.

asset allocation The investment decision regarding how to allocate funds across different asset categories (e.g., stocks, bonds, commodities, real estate).

asset-or-nothing option An option whose payoff is the underlying asset contingent on the underlying asset price being greater than or less than the critical price.

assignment The procedure by which option seller is notified of buyer's intention to exercise.

at-the-money An option whose exercise price is approximately equal to current underlying asset price.

automatic exercise The automatic exercise of an in-the-money option at expiration made by clearinghouse.

average option See *Asian option*.

backwardation A futures market in which the futures prices decline monotonically from the nearby to the distant contract months.

balance sheet risk The risk from balance sheet entries' denominations in different currencies.

bank discounts See *discounts*.

barrier option An option whose payoff depends upon payoff to an ordinary option and whether a prespecified barrier has been touched or crossed (e.g., down-and-in, down-and-out, up-and-in, and up-and-out options).

basis The difference between spot price and futures price.

basis mispricing The difference between the actual and theoretical basis.

basis point One-hundredth of a percentage point (i.e., 0.01%).

basis rate swap An exchange of floating-rate cash flows from two securities.

basis risk The uncertainty in the comovements of the spot and future prices. Equals the sum of the grade and time basis.

basis risk, grade The uncertainty about futures prices of roughly comparable goods.

basis risk, time The uncertainty about the difference between the futures price and the underlying asset's price.

bear market A market in which prices are falling.

bear spread An option spread that increases in value as the underlying asset price falls.

Bermuda option An option that can be exercised at a fixed number of points during the option's life (i.e., Bermuda is between Europe and America).

beta A measure of the risk of a security or portfolio relative to the market as a whole.

bid price The price at which a market maker is willing to buy immediately.

binary option An option whose payoff is one dollar if the option expires in the money and zero otherwise.

binomial model An option pricing model in which the underlying asset moves discretely through the option's life. At each point in time, the underlying asset price moves up or down.

Black model A model for valuing European-style forward or futures options. Assumes that the underlying forward or futures price is lognormally distributed at the option's expiration.

Black-Scholes model A model for valuing European-style options on nondividend-paying stocks. Assumes that the underlying stock price is lognormally distributed at the option's expiration.

block trade The purchase or sale of at least 10,000 shares of stock in one trade.

bond equivalent yield A yield calculation based on a 365-day rather than a 360-day year to allow comparison between the T-bill and other Treasury securities.

bond option An option to buy or sell a bond.

borrowing portfolio A portfolio with a positive weight on the risky asset(s) and a negative weight on the risk-free asset.

box A spread involving buying a call and selling a put at one exercise price, and selling a call and buying a put at another. All four options have the same underlying asset and expiration date.

brand new issue The first time shares in a privately owned firm are sold to the public.

breakeven asset price The asset price at which a derivatives position has a zero profit.

broker A person who executes a transaction on behalf of a customer. The fee charged by the broker is usually called a commission and is usually quoted on a per contract basis.

Brownian motion A stochastic process whose increments are normally distributed with zero mean and variance proportional to time.

bull spread A spread that increases in value as the underlying asset price rises.

butterfly spread An option position consisting of one long call at a particular exercise price, another otherwise identical long call at a different exercise price, and two otherwise identical short calls at an exercise price between the other two.

buy/write Buying the asset and selling a call option written on the asset simultaneously.

buyer (fixed-for-floating swaps) The party that pays the fixed rate stream in a fixed-for-floating rate swap.

buying collateral Accepting the collateral for a loan in a repo contract.

calculation amount The notional amount upon which the interest payment cash flow is computed.

calendar spread An option position that consists of buying an option with a given expiration date and the sale of an otherwise identical option with a different expiration date.

calibration Empirical adjustment of model parameters to match observed market prices.

call option An option that provides the buyer with the right to purchase the underlying asset at a fixed price (i.e., the exercise price) within a specified period of time (i.e., the time remaining to expiration).

callable bond A bond whose issuer has the right to redeem the bond prior to its maturity date.

callable swap An interest rate swap in which one party has the right to cancel the swap at a certain time without any additional costs.

cap A contract between a borrower and lender whereby the borrower is assured that he will not have to pay more than some maximum interest rate on borrowed funds. This type of contract is analogous to a series of European interest rate call options.

capital asset pricing model (CAPM) A model that specifies the expected return on an asset as a function of the risk-free rate, the expected return on the market, and the asset's beta or systematic risk. The CAPM was originally developed by Sharpe (1964) and Lintner (1965).

capital market line The linear relation between expected return and risk for efficient portfolios.

caplet An interest rate cap contract for a specific instance of time.

cash and carry A trading strategy in which an asset is purchased with borrowed funds and a futures contract is sold. The position is held to the futures contract expiration.

cash equivalent The risk-free dollar amount that offers the same level of satisfaction as holding a risky position.

cash market See *spot market*.

cash settlement A settlement procedure whereby derivative contracts are settled in cash and without physical delivery.

cash settlement The difference between spot and forward price paid in cash at expiration. See *delivery settlement*.
cash-or-nothing option An option whose payoff is a fixed amount of cash contingent on the underlying asset price being greater than or less than the exercise price.
catalytic cracking The splitting of longer hydrocarbon chains into shorter, lighter gasoline using chemical catalytes.
centralized market A market that brings together buyers and sellers with the help of an intermediary, thereby lowering search costs.
chart analysis The use of graphs and charts to analyze historical prices and trading behavior in an attempt to predict future price movements.
cheapest-to-deliver The T-bond or T-note that, if delivered on the CBT's T-bond or T-note futures contract, has the smallest difference between the invoice price and the cost of the bond.
chooser option An option that provides its holder with the right to pick either a call option or a put option.
circuit breaker A trading halt in the stock market or stock index futures market precipitated by a large price change in the index or futures are large.
clearinghouse A firm that guarantees the performance of both parties to a derivative contract, collects margins, and maintains recorders of the parties to all transactions.
cliquet option See *ratchet option*.
collar A contract between a borrower and lender whereby the borrower is assured that he will not have to pay more than some maximum interest rate on borrowed funds and the lender is assured that he will not have to receive less than some minimum interest rate on lent funds. This type of contract is analogous to a series of European interest rate call and put options.
commission A fee paid to the broker for executing a trade. The commission is usually quoted on a per contract basis.
commission broker A trader who executes transactions for customers. The fee for his service is the commission rate.
commodity A physical asset such as wheat, gold or crude oil.
commodity derivative A derivative written on a commodity or physical asset.
commodity fund A professionally managed fund that trades commodity futures and option contracts.
commodity futures A futures contract written on a physical commodity (e.g., wheat, gold, crude oil).
Commodity Futures Trading Commission (CFTC) The federal agency that regulates futures and futures option trading in the United States.
commodity option An option contract written on a physical commodity. Since few such options exist, the term is most frequently used to describe an option on a commodity futures.
commodity swap A swap in which the cash flows on at least one leg are based on a commodity price.
commodity trading advisor An individual who specializes in offering advice regarding the trading of futures or futures options.
compound option An option on an option.

compounding The accumulation of value over time as earlier rate payments also earn the same rate of return as the initial investment.

constant yield swap An interest rate swap with two floating rate legs.

contango A futures market in which the futures prices rise monotonically from the nearby to the distant contract months.

contingency order An order that becomes effective only when a certain market condition is met.

contingent-pay option An option in which the premium is paid at expiration and only if the option being in the money.

continuous compounding A model under which interest accrues continuously, that is, the compounding periods grow arbitrarily small.

continuous trading A market in which trading takes place continuously in time.

continuously compounded mean return The logarithm of the expected return over a time period

continuously compounded return, mean of The expectation of the logarithm of the returns over a time period. Identical to the continuously compounded mean return if returns are not variable across time.

contractual obligation One whose terms cannot be altered.

convenience value The value of having a commodity in inventory for its use in production.

convergence The reduction in the futures basis as the spot and futures prices to come together as a futures contract approaches expiration.

conversion An arbitrage that consists of: (1) selling a call and (2) buying a synthetic call.

conversion factor An adjustment factor applied to the settlement price of the CBT's T-bond contract that converts the price of an eligible T-bond into the price of an 6% nominally required for delivery. Also applies to the CBT's T-note futures contract.

convertible bond A corporate bond that provides its holder with the right to convert the bond into shares of the firm at a fixed rate.

convexity A measure of a bond's price sensitivity to changes in the bond's yield.

corner A market situation in which a trader or group of traders attempt to acquire the available supply of an asset.

cost of carry The cost of holding an asset. This includes interest cost plus (less) any costs (benefits) from holding the asset (e.g., warehouse rent and insurance for physical assets and dividend income and coupon payments for financial assets).

costless arbitrage A self-financing arbitrage strategy.

counterparty The opposite party in a derivative contract.

counterparty risk The risk that a counterparty will default.

coupon The periodic (usually semiannual) interest payment on a coupon-bearing bond.

coupon bond Same as *coupon-bearing bond*.

coupon rate The stated interest rate on a coupon-bearing bond.

coupon swap See *fixed-for-floating rate swap*.

coupon-bearing bond A bond that has periodic coupon payments as well as repayment of principal at maturity.

covariance A statistical measure of the association between two random variables.

covered call Trading strategy that consists (1) buying the underlying asset, and (2) selling a call option. Also called *buy-write*.

covered write Same as *covered call*.

crack spread A spread that consists of: (1) buying (selling) crude oil futures and (2) selling (buying) heating oil or gasoline futures.

credit derivative An agreement concerning the transfer of credit risk between a buyer and seller of this protection.

credit event Any event related to a credit risk realization.

credit risk The risk of a loss arising from default or credit downgrade of a counterparty.

credit-linked note A composite security structured to behave like a particular reference security.

cross-hedging Any hedge where the asset being hedged is not the specific asset underlying the futures contract.

cross-rate option A foreign currency option where the numeraire is not dollars, but a foreign currency.

cross-rate relation Same as *triangular arbitrage*.

crush spread A spread that consists of: (1) buying (selling) soybean futures and (2) selling (buying) soybean oil or soymeal futures.

crushing Processing soybeans into soybean oil and soy meal.

cubic spline interpolation An interpolation method with a piecewise-defined interpolant of polynomials of the third degree.

cum-dividend A stock trading before a cash dividend is paid.

currency option An option to buy currency.

currency swap A swap in which the interest payments on at least one leg are tied to a foreign currency.

daily price limit An exchange-imposed rule governing the maximum absolute daily price movement on a futures contract.

daily settlement Same as *marking-to-market*.

day order An order that is canceled if it is not filled by the end of the trading day.

day trader A trader who closes out all positions by the close of the trading day.

dealer A person or firm who makes a market in a particular asset or derivative contract.

deep market A market in which large trades can be executed with little impact on price.

default-free An asset with no risk of default (e.g., U.S. Treasury securities).

deferred swap Same as a *forward swap*.

delivery Closing a derivative contract position by delivering the asset specified in the contract (e.g., a trader who is short wheat futures at the futures expiration must deliver the wheat to the trader who is long the futures contract).

delivery date The date on which the underlying asset is exchanged for cash payment.

delivery month The calendar month during which delivery on a futures contract must be made.

delivery settlement The conclusion of a forward contract through the exchange of physical underlying commodity at set price on expiration.

delta The change in the option's model value induced by a change in the underlying asset price.

delta-neutral A portfolio whose value is insensitive to movements in the asset price.
derivative Same as *derivative contract*.
derivative contract A financial contract that specifies the terms of a future transaction (or set of transactions) in some underlying asset. The term, "derivative," arises because the value of this contract is "derived" from the underlying asset price.
Designated Order Turnaround (DOT) The NYSE's system for expediting stock transactions.
diagonal spread An option spread in which the options on the same underlying asset differ by both time to expiration and exercise price.
digital option See *binary option*.
dilution factor The proportion of the firm owned by warrant holders if they exercise their warrants.
discount The method of quoting U.S. Treasury bill prices.
discount bond A zero-coupon bond.
discount factor The present value of one dollar to be received at a future date.
dividend A cash payment made to common stock holder.
dividend capture A strategy of buying the stock before a dividend issue and selling immediately after, capturing part of the dividend payment.
dividend declaration date The date of a dividend announcement.
dividend payment date The date on which a declared dividend is paid.
dividend protection A feature on an over-the-counter stock option whereby the exercise price is reduced by the amount of the dividend on an ex-dividend day.
dividend yield The cash dividends paid on a stock or stock index expressed as a percentage of the stock price or index level.
doubling A gambling strategy to double the amount bet each time a loss occurs.
down-and-in option An option that becomes a standard option only if the price of the underlying asset falls below the barrier. Otherwise, it expires worthless.
down-and-out option A standard option that becomes worthless if the price of the underlying asset falls below the barrier. Otherwise, it expires normally.
downtick A price decrease equal to one tick.
dual trading The practice of a floor trader on a futures exchange trading for a customer as well as on his or her own account.
duration The weighted average of the maturities of the bond's cash flows, where the weights are the fractions of the bond's price that the cash flows in each time period represent. Equals the percent change in bond price for an infinitely small change in yield.
DV01 Equals the change in bond price if the yield changes by one basis point.
dynamic hedge A hedge strategy maintained by dynamically rebalancing portfolio weights.
dynamic portfolio insurance Portfolio insurance by synthetically creating a put
early exercise Exercising an American option prior to the expiration date.
early exercise premium The economic value of the right to exercise an American-style option early. Equals the difference between the value of an American-style option and an otherwise comparable European-style option.
effective date The first day of the term of a contract made between two parties.

effective interest rate The annualized rate of interest on an investment that has multiple compounding periods per year.
efficient portfolio A portfolio that has the lowest risk for a given level of expected return.
employee stock option A call option on the firm's stock awarded to an employee.
employee stock purchase plan An award given to employees that provides the right to buy the firm's stock at a discount.
end-of-month option The right to deliver any day during the last remaining business days of the month after the futures contract has ceased trading.
equity basis swap An exchange of cash flows from two different equity indices.
equity option An option on an individual stock or a stock index.
equity swap A swap in which one leg involves a series of cash flows that are linked to equity.
errors-in-the-variables problem The effect of measurement errors in the independent variables on the t-statistics of an OLS regression.
eta The percentage change in the option's model value induced by a percentage change in the underlying asset price.
Eurodollar See *Eurodollar time deposit*.
Eurodollar contracts Derivative contracts written on Eurodollar time deposits.
Eurodollar futures contract Futures contract written on a Eurodollar time deposit.
Eurodollar time deposit U.S. dollar deposit in a European bank.
European Currency Unit (ECU) A composite measure of a U.S. dollar exchange rate based on a weighted-average of European currency rates.
European option See *European-style option*.
European-style option An option that can be exercised only at expiration.
exchange option The right to exchange one asset for another.
exchange rate The rate at which a unit of one currency is exchanged for another.
ex-dividend date The date on which a stock trades without its current dividend embedded in price.
exercise Refers to the option holder executing his right. A call option holder, for example, "exercises" by notifying his broker and paying the exercise price in cash. In return, he receives the underlying asset.
exercise price The price at which the underlying asset is bought or sold if the option is exercised.
exotic option An option whose terms are nonstandard.
expectations theory A term structure theory under which forward rates are the market's expectation of future spot rates.
expected recovery value The amount a bondholder expects to receive in the event of default.
expected utility of terminal wealth The "best guess" of an agent's utility of wealth after the realization of payoffs.
expected value The "best guess" of the future value of an asset.
expiration The time and date on which the derivative contract expires.
expiration date The date on which the derivative contract expires.
ex-split date The date on which the stock split takes effect.
extendible bond A bond whose holder has an option to extend its term-to-maturity.
face value The principal amount of a bond repaid at the bond's maturity.

fair bet A gamble that has an expected outcome of zero.
fair value Same as theoretical value or model value.
feasibility Whether an outcome of an objective function is possible under the given constraints.
fill-or-kill (FOK) order An order that must be filled immediately and in its entirety. Failing this, the order is canceled.
financial asset See *security.*
financial futures A futures contract written on a financial asset (e.g., stocks, bonds, foreign currencies).
fixed-against-floating swap See *fixed-for-floating rate swap*.
fixed-for-floating rate swap An exchange of a fixed rate cash flow and a floating rate between two parties.
fixed income securities A security with prespecified interest payments (e.g., a coupon-bearing bond).
flat volatility A forward volatility curve that is invariant with respect to maturity.
floating rate note A bond that pays interest based on a floating interest rate.
floating rate option An option on a floating rate cash flow such as LIBOR.
floating rate, day-count fraction The fraction of a year equal to a bond's designated maturity.
floor A contract between a borrower and lender whereby the lender is assured that he will not have to receive less than some minimum interest rate on lent funds. This type of contract is analogous to a series of European interest rate put options.
floor broker A trader who executes orders on behalf of customers on the floor of an exchange.
floor trader A member of an exchange who trades on the floor of the exchange.
floorlet An interest rate floor contract for a specific instance in time.
foreign currency derivatives Derivative contracts written on foreign currency spot exchange rates (e.g., forwards, futures, options, swaps).
forward commitment See *forward contract*.
forward contract A financial contract that requires its buyer to purchase an underlying asset at a fixed price on a fixed future date. No cash flows is paid until the delivery date.
forward curve The relation between forward prices and maturity.
forward discount factor A discount factor for a cash flow at a future date.
forward exchange rate The value one unit of a currency in terms of another (e.g., the U.S. dollar cost of one British pound (the "USD/GBP" exchange rate) might be 1.60 USD, while the British pound cost of a U.S. dollar (the "GBP/USD" exchange rate) is 0.625 GBP).
forward market A market in which forward contracts are traded.
forward option An option on a forward contract.
forward premium A positive difference between the forward price and the current spot price.
forward price The delivery price written in a forward contract.
forward rate of interest An interest rate on a loan that begins at a future date.
forward swap A forward contract to enter into a swap.
forward transaction An exchange agreement to take place in the future. See *forward contract.*

forward volatility The volatility of forward interest rates.
forward volatility curve The relation between forward volatilities and maturity.
forward start option An option contract that begins at a future date.
forward start swap An interest rate swap that begins at a future date.
fractional distillation The process of splitting crude oil into various hydrocarbons such as gasoline by the boiling point properties of each compound.
frictionless markets Markets that operate without trading impediments such as transaction costs or position limits.
front-running Trading ahead of someone who has private information or an order size that is likely to move the current market price.
full carry The term used to describe the relation between the futures price and the spot price when the futures prices equals exactly the spot price plus the costs of carry.
fundamental analysis Predicting price movements based on the fundamental factors influencing an asset's value.
Futures commission merchant A firm in the business of executing futures and/or futures options transactions for customers.
futures contract An agreement between two parties, a buyer and a seller, to exchange an asset or currency at a later date at price fixed today. Distinguished from a forward contract by virtue of the futures exchange's daily settlement procedure (i.e., marking to market).
futures option An option to buy or sell a futures contract.
futures price The delivery price written in a futures contract.
futures-style settlement A settlement procedure used by an exchange in which buying a contract requires no immediate cash outlay. Cash settlement is made daily based on the change in the contract price.
gamma The change in the option's delta induced by a change in the asset price.
gamma-neutral A portfolio whose delta is insensitive to movements in the asset price.
gap option An option under which the payoff amount and the payoff occurrence are determined by two separate constants.
Garman-Kohlhagen model A model for valuing European-style foreign currency options.
GLOBEX The CME's automated trading system in which bids and offers are entered into a computer and executed electronically.
going long To buy.
going short To sell.
gold forward rate (GOFO) The difference between the risk-free interest rate and the lease rate on gold.
good-till-cancelled (GTC) order An order that remains in effect until cancelled. Usually used with stop orders or limit orders.
grade A measure of a commodity's quality.
Greeks The sensitivities of option values to changes in its input parameters.
gross (processing) margin The difference between the revenue from and costs of producing.
guarantee A contract in which the seller accepts the responsibility of the buyer's payment obligation in case of default.
guts A strangle where both the call and the put are in-the-money.

haircut Lending a fraction of the collateral's value in a repo to protect the lender.
hedge A trade that reduces the risk of the individual or firm's current position.
hedge position Selling (buying) the futures while holding a long (short) position in the underlying.
hedger A trader who attempts to reduce his risk.
hedging Reduce risk.
historical volatility Volatility estimated using historical return data.
holding period The time period over which a portfolio is held.
horizontal option spread Buying and selling call or put options with the same exercise price but different expiration dates.
horizontal spread Same as *calendar spread*.
hybrid A derivatives contract that has characteristics of multiple basic derivatives.
immediate-or-cancel (IOC) order An order that must be filled immediately or it will be canceled. IOC orders need not be filled in their entirety.
immunization A bond portfolio hedging strategy designed to immunize the bond portfolio value from changes in the level of interest rates.
implicit volatility See *implied volatility.*
implied financing cost The difference between the minimum share price and the cash advance amount in a variable prepaid forward contract.
implied forward discount factor A discount factor implied by two spot discount factors at different maturities.
implied forward rate A forward rate of interest implied by two spot rates of different maturities (e.g., the forward rate on a one-year loan in one year is implied by the prevailing spot rates on a one-year and a two-year loan).
implied repo rate The cost of financing a cash-and-carry position implied by the relation between a T-bond and a *t*-bond futures contract.
implied standard deviation (ISD) See *implied volatility.*
implied volatility The standard deviation of asset return obtained by setting the market price of an option equal to the value given by a particular option pricing model.
index amortized swap An interest rate swap whose notional amount is amortized over the life of the swap.
index arbitrage The arbitrage between a stock index futures and the portfolio of stocks that underlie the futures.
index option An option whose underlying asset is an index.
index participations Securities that behave as if they were units in a particular stock index portfolio.
initial margin The minimum amount of money that a customer must deposit with his or her futures broker to establish a futures or options position. Margin is required to guarantee that a customer honor his or her contract obligations and may be deposited in the form of interest-bearing securities.
institutional customer A customer that is a firm or a fund rather than an individual investor. See also *retail customer.*
interbank Business transactions conducted between banks.
interest rate cap An OTC contract that protects a borrower from floating rates above a certain level.
interest rate collar Buying an interest rate cap and selling an interest rate floor.

interest rate derivative A derivative security whose value depends on the level of or the difference between interest rates.
interest rate floor An OTC contract that protects a lender from floating rates below a certain level.
interest rate futures A futures contract on an interest rate instrument.
interest rate option An option contract on an interest rate instrument.
interest rate parity An arbitrage relation that holds between foreign currency spot prices and interest rates.
interest rate parity An arbitrage relation equating the forward premium or discount on an exchange rate to the difference between the short-term interest rates in the two countries.
interest rate swap A swap in which interest payments are exchanged.
intermarket spread A spread with derivatives on different, but related, underlying assets.
internal rate of return The interest rate that equates the present value of the future cash flows with the market price (e.g., the yield to maturity on a coupon-bearing bond).
in-the-money A call (put) option whose exercise price is less (greater) than the underlying asset price.
intracommodity spread A spread between two futures contracts written on the same commodity but with different delivery months.
intrinsic value The amount by which an option is in-the-money or zero, whichever is greater.
invoice price The actual price that a T-bond futures buyer pays to the seller at delivery.
Johnson-Shad Agreement The 1982 agreement between CFTC chairman Phillip McBryde Johnson and SEC chairman John Shad providing trading in stock futures.
kappa See *vega*.
lambda See *vega*.
last trade price The price of the last transaction of the day.
lattice A tree that models the movement of asset prices or interest rates through time in discrete jumps.
law of one price The economic principle that two identical assets must have the same price.
lease rate The interest paid on a physical asset borrowed.
leg One side of an arbitrage or spread position.
lending portfolio A portfolio with positive weight on the risk-free asset as well as the risky asset(s).
leverage Borrowing to finance the purchase of an asset.
leveraged swap A swap whose fluctuations can exceed the notional amount.
limit down Maximum allowable daily price decrease for an exchange-traded contract.
limit move Maximum allowable daily price movement for an exchange-traded contract.
limit order An order to be filled at a specified price or better.
limit up Maximum allowable daily price increase for an exchange-traded contract.

linear interpolation A weighted average of two endpoints as an estimation of some point in the line segment between them.
liquid market A market in which trades can be executed quickly.
liquidity See liquid market.
liquidity preference theory A term structure theory in which long-term rates exceed short-term rates because lender preference for short-term loans.
local Another name for a market maker on a futures or futures option exchange.
locked market A market in which trading has been suspended because prices have reached their limit.
lognormal distribution A probability-distribution for a random variable x such that the natural logarithm of x has a normal distribution.
London Interbank Offer Rate (LIBOR) The interest rate on a Eurodollar time deposit.
long A position created by buying.
long hedge A hedge involving a short position in the spot market and a long position in the futures.
long-term equity anticipation securities (LEAPS) Options on stocks and stock indexes with times to expiration of more than one year.
lookback call option An option whose payoff at expiration is the asset price less the minimum price that the asset has had over the life of the option.
lookback put option An option whose payoff at expiration is the maximum price that the asset has had over the life of the option less than asset price.
lower bound An arbitrage relation governing the lowest possible price of an option.
macrohedge A hedge of the firm's combined risk exposure of all of its assets and liabilities.
maintenance margin The minimum amount of money that must be kept in a margin account on any day other than the day of a transaction.
margin Funds deposited in a margin account to ensure contract performance.
margin call A demand for additional margin funds.
margining system The requirement of a good-faith collateral deposit upon entering a futures position for both parties.
market efficiency A market in which the price of an asset reflects its true economic value.
market frictions Conditions in the market that restrict trading (e.g., trading costs, price limits, up-tick rules).
market integrity The safe, fair, and efficient operation of markets to encourage investor participation.
market maker Someone who stands ready to immediately buy (at the bid price) or sell (at the ask price).
market order An order to be filled immediately at the current market price.
market portfolio The portfolio consisting of all risky assets in the market.
market price of risk The premium investors demand to bear risk.
market segmentation theory A term structure theory based on the supply and demand in long-term and short-term interest rate markets.
market timing A trading strategy based on predicting the directional moves in the underlying asset price.
market transparency See *transparency.*

market-if-touched (MIT) order An order that becomes a market order if price touches or crosses a pre-specified level.
market-indexed security A derivative contract that pays a minimum return plus a given percentage of any change in the market above a certain level.
market-on-close (MOC) order An order to be filled close as possible to the close of trading.
Markowitz efficiency frontier The set of risk-minimizing portfolios for a range of return levels.
mark-to-market See *daily settlement*.
maturity date See *expiration date*.
microhedge A hedge of an individual asset's (rather the firm's overall) risk exposure.
minimum selling price The lowest price the agent would be willing to accept for his position.
minimum variance hedge See *optimal hedge*.
money market The market for short-term securities.
money market hedge A hedge by switching currencies.
money spread A spread that consists of: (1) buying one option and (2) selling an otherwise identical option with a different exercise price.
Monte Carlo simulation A probabilistic simulation of the possible changes in the price of an asset over a period of time.
multiple listing A security or derivative contract that is traded on more than one exchange.
naked A long or short position with no offsetting hedge.
naked call See *uncovered call*.
naked option position An option position with no offsetting hedge.
natural hedge An endogenous negative correlation that reduces revenue risk such as the relationship between price and quantity.
nearby contract The futures contract with the shortest time to expiration.
net cost of carry The difference between the benefits and costs associated with holding an asset through time.
net cost of carry relation The comparison between buying the asset in the futures market and holding it by buying at the spot.
net present value The present value of an investment's cash flows less the initial cost of the investment.
netting Aggregating all payments between two counterparties.
no-arbitrage pricing models Models based on the premise that securities with identical payoffs should have identical values.
nonlinear programming problem The mathematical process of maximizing (minimizing) an objective function bounded by a system of equalities and inequalities.
nonstandard option An exotic option.
normal distribution The standard bell-shaped probability distribution.
notional principal The principal amount a loan or a bond.
obligation to pay fixed The reference for terms "buyer" and "seller" in fixed-for-floating swaps. See buyer, seller (fixed-for-floating rate swap).
offset See *offsetting order.*

offsetting order A liquidating trade that has exactly the opposite terms of an outstanding position.
omega Same as *vega*.
one-cancels-the-other (OCO) order Two orders submitted simultaneously. If either is filled, the other is canceled.
open interest The number of derivative contracts that have been established and not yet been offset or exercised.
open outcry Trading in a pit in which bids and offers are indicated by shouting.
optimal hedge The number of derivative contracts that should be bought or sold in order to minimize the risk of changes in the value of the overall portfolio.
option A contract that provides the right to buy or sell an asset at a specified price (i.e., the exercise price) over a specified period (i.e., the time remaining to expiration).
option class All of the options of a particular type (call or put) on a given stock, index, currency, or futures commodity.
option contract See *option*.
option on futures See *futures option*.
option premium The price of an option.
option series One of the options within an option class. Uniquely identified by (1) the option type (call or put), (2) the exercise price, and (3) the expiration day.
option type An option is designated as either a call or a put.
option writer Someone who sells an option.
options clearing corporation (OCC) The firm that operates as the clearinghouse for U.S. option exchanges.
order book official (OBO) An exchange official responsible for opening rotation and maintaining the limit order book.
ordinary least squares An optimization technique to find the best fit line through a set of points.
OTC derivatives Derivatives traded in the over-the-counter market, that is, negotiated between private parties.
out trade A trade made on an exchange that cannot processed due to conflicting terms reported by the two parties involved in the trade.
out-of-the-money A call (put) option whose exercise price is greater (less) than the underlying asset price.
outright position A position involving only the future contract, but not the underlying or related securities.
overnight repo A repurchase agreement with a maturity of one night. See also *repo*.
overpriced A condition in which the market price of a security or derivative exceeds its model value.
over-the-counter (OTC) market A market for securities or derivatives not conducted on an organized exchange.
overwrite Sale of call option against an existing asset position.
par bond yield The coupon interest rate that makes the bond price equal its face value. The yield-to-maturity equals the coupon rate if the bond is selling at par.
par bond yield curve The relation between par bond yields and their terms to maturity.
par grade The standard grade of the commodity underlying the futures contract.

par swap rate The fixed rate on a plain vanilla interest rate swap that sets the value of the swap to zero.
par value See *face value*.
partial expectation An expectation taken conditionally.
participation percentage The percentage of asset return earned by the holder of participation derivative.
passive hedge A hedge that consists of buying/selling derivatives and holding them to expiration.
passive portfolio insurance Portfolio insurance by buying an index put option.
path dependent option An option whose value depends upon the path that the underlying asset prices takes over over the life of the option.
paylater option See *contingent option*.
payoff The amount of money received from a transaction at the end of the holding period.
perfect substitute An asset that is the equivalent of (and can thus be substituted for) another.
physical asset See *commodity.*
pit An octagonally or hexagonally shaped, multi-tiered station on a trading floor where a specific group of contracts trade.
plain vanilla interest rate swap An interest rate swap where one side receives fixed-rate payments and pays floating rate, and the other side receives the floating rate and pays the fixed rate.
portfolio A set of securities.
portfolio insurance Index option trading strategy designed to provide a minimum or floor value of a portfolio at a future date.
portfolio theory The study of how individuals choose to allocate their wealth among risky assets.
position The composition of a trader's portfolio.
position limit An exchange rule limiting the maximum number of contracts an individual can hold.
position trader A trader who typically holds a position for longer than a day.
preferred habitat theory See *market segmentation theory.*
futures premium The difference between the futures and spot index prices assuming open markets.
option premium The price of an option.
price limit An exchange rule limiting the maximum price increase or decrease on a particular contract during one trading day.
price risk The risk of not knowing the level of price at some future date.
primary market The market for assets when they are originally issued and not previously traded among the public. In contrast to secondary market.
profit diagram A figure showing the profit of a derivative position at expiration.
program trading The simultaneous purchase or sale of a portfolio of securities (usually stocks). Usually requires the use of computers and high-speed communications lines.
protected equity note A discount bond-like contract providing a guaranteed rate of return on the principal plus a fraction of upside return on an underlying such as a stock index. Also known as a principal-protected note, capital guarantee note, safe return certificate, equity-linked note, or index-linked note.

protective put An investment strategy involving buying a put to limit possible declines in the price of the underlying asset.
pure discount bond See *discount bond*.
put option An option that provides the buyer with the right to sell the underlying asset at a fixed price (i.e., the exercise price) within a specified period of time (i.e., the time remaining to expiration).
putable swap An interest rate swap where one side has an opportunity to cancel the swap.
put-call parity An arbitrage relation linking the prices of a call, a put with the same exercise price, and the underlying asset.
quadratic approximation A numerical method for approximating the value of American-style options. See Barone-Adesi and Whaley (1987).
quality option An option that provides the right to deliver any one of a number of eligible assets.
quantity risk The risk of not knowing the quantity of an asset at some future date.
quoted bid-ask spread The difference between the market maker's ask and bid price quotes.
ratchet option A sequence of forward-start options.
rate capped swap An interest rate swap in which the floating rate is capped.
ratio spread A spread in which the number of contracts is chosen in such a way that the overall position is delta-neutral.
ratio swap A swap contract where the effective interest rate is determined by a ratio of two other rates.
ratio vertical spread A ratio spread in which more contracts are sold than are purchased, with all contracts having the same underlying and expiration date.
real asset A tangible asset such as real estate or a natural resource.
replicating portfolio A portfolio of assets which replicates the cash flows of a derivative contract.
repo See *repurchase agreement*.
repurchase agreement (repo) An agreement between two parties under which one party agrees to sell and then later buy a security on an agreed-upon date and at an agreed-upon price. The difference between the original sale price and the subsequent repurchase price is in effect the interest on a loan, which, when expressed as an interest rate, is commonly known as the repo rate.
reset date The date on which the floating rate on an interest rate swap is reset.
retail automatic execution system (RAES) A computerized system used by the CBOE to expedite the filling of public orders.
retail customer A customer that is an individual rather than a firm or a fund. See also institutional customer.
retractable bond A bond whose holder can choose to redeem prior maturity.
reversal See reverse conversion.
reverse conversion An arbitrage that consists of (1) buying a call and (2) selling a synthetic call.
reverse crush spread The opposite of a crush spread, selling soybean futures and buying soy product futures.
reverse repo (reverse) See *reverse repurchase agreement*.
reverse repurchase agreement The counterparty's position in a repo transaction, lending the asset in question.

reversing in See *buying collateral*.
reversing out See *selling collateral*.
rho (carry) The change in the option's delta induced by a change in the cost-of-carry rate.
rho (carry)-neutral A portfolio whose delta is insensitive to movements in the cost-of-carry rate.
rho (interest) The change in the option's delta induced by a change in the interest rate.
rho (interest)-neutral A portfolio whose delta is insensitive to movements in the interest rate.
rights See *warrants*.
risk aversion The characteristic that, holding other factors constant, individuals want to avoid risk.
risk preferences An investor's attitude toward risk.
risk premium The additional return risk-averse investors expect for assuming risk.
risk tolerance The maximum amount of risk measurable in standard deviations that an investor is willing to take.
risk-free rate A default-free interest rate.
riskless rate A default-free interest rate.
risk-minimizer An investor who minimizes portfolio risk.
risk-neutral investor An investor who is indifferent toward risk.
risk-neutral valuation Computing the value of an asset or derivative contract under the assumption that investors are risk-neutral.
Roll model An American-style call option model with one known dividend paid on the underlying stock.
sale-repurchase agreement See *repurchase agreement*.
scalper An exchange trader who attempts to profit by buying at the bid and selling at the offer.
scratch trade A zero-profit trade designed to adjust a dealer's inventory.
seasoned new issue An additional issue of already publicly traded securities.
seat A term used to refer to a membership on an exchange.
secondary market The market for assets that were issued previously.
Securities Exchange Commission (SEC) The federal agency responsible for regulating securities markets and listed option markets in the United States.
security A certificate of ownership of an investment.
security market line The linear relation between expected return and market risk for individual securities and derivatives. One of the results of the capital asset pricing model.
self-financing trading strategy A trading strategy that has no cash inflows or outflows prior to its liquidation.
seller (fixed-for-floating swaps) The party that pays the floating interest rate stream in a fixed-for-floating rate swap.
selling collateral The buyer's selling of securities to provide collateral for the loan in a repo.
series See *option series*.
settlement price The end-of-day price established by the exchange clearinghouse used in marking-to-market futures contract positions.

shareholder record date The date at which an individual must have held the stock in order to receive an announced dividend.

short A position created by selling.

short hedge A hedge involving a long position in the spot market and a short position in the futures.

short sale A trading strategy in which an investor borrows a security from a broker and sells the security. At a later date, the investor buys back the security and returns it to the broker.

short squeeze A speculative strategy that manipulates prices by making it difficult for agents with a short futures position to unwind through the purchase of large amounts of both the underlying commodity and related futures contracts. Recall that a short futures position may be exited by either delivering the underlying, or going long an offsetting number of futures. Once demand for these securities drives prices up, the party attempting the short squeeze can realize gains by selling.

short volatility A portfolio with a negative vega that will decrease in value if volatility increases.

simple interest rate An interest rate which does not include compounding.

simple return The income from holding a security divided by its initial cost.

specialist A market maker given exclusive rights by an exchange to make a market in a specified asset.

speculation A trading position established to profit from a directional move in the price of an asset.

speculative bubble A rapid increase in price due to a rush of buyers unrelated to fundamental qualities of a security but hoping to profit from the price trend.

speculative gain A profit made on a strategy that relies on a directional price move.

speculator A trader who hopes to profit from a directional move in the price of an asset.

spot exchange rate The current rate of exchange of one unit of a currency for another.

spot market The market for an asset that involves the immediate sale and delivery of the asset.

spot price The price on an asset for immediate delivery.

spot rate An interest rate on a loan that begins immediately.

spread A trading strategy that consists of buying one contract and selling another similar contract.

spreader A trader who engages in spread transactions.

stack hedge A hedge in which short-term futures contracts are used to hedge long-term commitments.

Standard and Poor's 500 Index (S&P 500) A market-value weighted stock price index consisting of 500 NYSE, AMEX, and NASDAQ-traded stocks.

standard deviation A measure of the dispersion of a random variable around its mean. It is equal to the square root of the variance.

standard option An ordinary call or put option.

static hedge See *passive hedge*.

stock dividend A dividend paid with additional shares of the stock.

stock index An index created from the prices of a specific portfolio of stocks.

stock index futures A futures contract written on a stock index.
stock index option An option contract on a stock index.
stock option An option contract on a common stock.
stock price collar Avoiding some of the downside risk of stock ownership by financing out-of-the-money put purchases with out-of-the-money call sales, while enjoying other benefits of ownership like voting rights and dividend payments.
stock split A situation where a company reduces its share price and increases its number of shares outstanding by issuing additional shares on a pro rata basis to each existing shareholder. The product of the old share price and the old number of shares outstanding equals the product of the new share price and the new number of shares outstanding.
stock valuation formula A formula for determining a present value of the future cash flows from a stock.
stock-style settlement A settlement procedure used by an exchange in which buying a contract requires immediate and full payment of the asset price.
stop-limit order Same as *stop-loss order.*
stop-loss order An order to buy or sell if the price touches or crosses at pre-specified level.
storage The act of holding a commodity or asset for a period of time.
storage costs The costs to storing a commodity. These include warehouse rent, insurance, and spoilage.
straddle An option position consisting of a long (short) call and a long (short) put with the same exercise price and time to expiration. Sometimes called a volatility spread.
strangle An option position consisting of a long (short) call and a long (short) put with the same time to expiration but with the call's exercise price exceeding that of the put.
strap A trading strategy that consists of: (1) buying (selling) two calls and (2) buying (selling) one put, where all options are written on the same underlying asset and have the same exercise price and expiration date.
strike price See *exercise price*.
strike spread See *money spread*.
striking price See *exercise price*.
strip A trading strategy that consists of: (1) buying (selling) one call and (2) buying (selling) two puts, where all options are written on the same underlying asset and have the same exercise price and expiration date.
strip hedge A hedge in which a series of futures contracts of successively longer expirations are bought or sold.
stripped bond A bond which was originally coupon-bearing but whose coupons and principal repayment have been separated and are selling as individual discount bonds.
swap contract A derivative contract that involves exchanging cash flow streams.
swap dealer A firm that makes a market in swaps.
swap rate The loss rate for exchanging units of currencies at a future date.
swaption An option on a swap.
switching option See *quality option*.

synthetic asset A long (short) call together with a short (long) put where both options have the same underlying, exercise price, and expiration date.
synthetic derivative A portfolio of traded securities that replicates the cash flows of a derivative contract.
synthetic long call Generated by buying the underlying asset and buying the put with the same exercise price. The cost of the position is financed at the short-term interest rate.
synthetic long put Generated by selling the underlying asset and buying a call put. The net proceeds from establishing the position are invested at the short-term interest rate.
synthetic short call Generated by selling the underlying asset and selling a put. The proceeds from the sale are invested at the short-term interest rate.
synthetic short put Generated by buying the underlying asset and selling a call. The net cost of establishing the position is financed at the short-term interest rate.
tailing the hedge Adjusting the hedging ratio to account for the interest paid or received from the daily settlement of the futures position.
target duration The desired level of interest rate risk (i.e., duration) of a bond portfolio.
T-bill See *Treasury bill*.
T-bill futures See *Treasury bill futures*.
T-bond See *Treasury bond*.
T-bond futures See *Treasury bond futures*.
technical analysis Prediction of future price movements based on an analysis of past prices and trading volumes.
term repo A repurchase agreement with a maturity of more than one day.
term structure of forward exchange rates Relation between exchange rates and time to maturity
term structure of interest rates Relation between zero-coupon interest rates and time to maturity.
term structure of spot rates See term structure of interest rates
termination date The day on which a contract between two parties expires.
theoretical value An option value generated by a theoretical model.
theta The change in the option's model value induced by a change in time to expiration.
theta-neutral A portfolio whose value is insensitive to movements in time.
tick The minimum permissible price fluctuation.
tick size See *tick*.
time premium See *time value*.
time spread See *calendar spread*.
time value The difference between the option's price and its value if it were exercised for certain on the expiration date.
time value decay The erosion of an option's time value through time.
timing option The right to deliver a T-bond on any day during the CBT's T-bond futures delivery month.
T-note See *Treasury bond*.
T-notes futures See *Treasury note futures*.

total rate of return swap A swap contract that encompasses both cash flows and value changes of an asset.
trade date The day on which a contract is made between two parties.
trading halt A temporary suspension of trading when the price of a futures or an asset has moved by a predetermined amount.
transaction costs The costs of trading. Usually consists of two components: a broker's commission and a market maker's bid/ask spread.
transparency The observability of the pricing information for a contract.
Treasury bill A short-term discount bond issued by the U.S. government.
Treasury bill futures A futures contract written on Treasury bills.
Treasury bond A coupon-bearing bond issued by the U.S. government. Have terms to maturity exceeding 10 years.
Treasury bond futures A futures contract written on Treasury bonds.
Treasury note A coupon-bearing bond issued by the U.S. government. Have terms to maturity between two and 10 years.
Treasury note futures A futures contract written on Treasury notes.
Treasury strips A zero-coupon bond created by "stripping" the interest and principal payments from Treasury notes and bonds.
triangular arbitrage The arbitrage relation linking the exchange rates of three currencies.
trinomial model Similar to the binomial model, the underlying asset moves discretely through the option's life. At each point in time, the underlying asset price moves to one of three levels.
unbiased expectations theory See *expectations theory.*
uncovered option Writing a call or a put without an offsetting position in the underlying asset.
underlying The instrument underlying the derivative contract.
underpriced A condition in which the market price of a security or derivative is below its model value.
underwrite To buy a securities issue from a company and resell it to private investors at a profit.
unsystematic risk The risk of a security that is not explained by market movements.
unwinding To exit a current position in the market through an offsetting transaction.
up-and-in option For up-and-in options, an upper level (barrier) is specified for the asset price on which the option is written. For a up-and-in call (put) option the contract becomes a standard call (put) option if the price of the underlying asset goes above the barrier. If the price of the underlying asset never goes above the barrier during the life of the contract, the contract expires worthless.
up-and-out option An option that expires automatically when the asset price on which the option is written hits a predefined barrier.
uptick A price increase equal to one tick.
uptick rule A rule in the stock market which prohibits short sales except when the last trade had a price increase.
utility of wealth function A measure of the satisfaction an agent derives from a level of wealth.

valuation-by-replication The method of finding a portfolio of known value with identical payoffs in all states. By the principle of no-arbitrage, the replicated asset should have the same value.

variable prepaid forward contract A contract for the future sale of a contingent number of shares for a prepaid sum.

variance A measure of the dispersion of a random variable around its mean.

variation margin The gains or losses on open futures position when it is market-to-market.

vega The change in the option's model value induced by a change in volatility.

vega-neutral A portfolio whose value is insensitive to movements in volatility.

vertical bear spread A spread that consists of: (1) buying a call (put) and (2) selling a call (put) with a lower exercise price. The options have the same expiration date.

vertical bull spread A spread that consists of: (1) buying a call (put) and (2) selling a call (put) with a higher exercise price. The options have the same expiration date.

vertical spread See *money spread*.

vesting period A time period during which received employee stock options cannot be exercised.

volatility The standard deviation of return on an annualized basis.

volatility spread See *straddle*.

volume Number of contracts traded in a particular interval of time.

vulnerable derivative A derivative contract with default risk.

warrant A contract issued by a firm that allows the holder to buy its underlying stock at a predetermined price within a specified amount of time.

wealth constraint The property that the proportions of an investor's allocations to various assets must sum to one.

wild card option An option that arises in a derivative contract when the settlement price of the contract is established before the market is closed. For example, wildcard options are embedded in the CBT's T-bond futures and the CBOE's S&P 100 options.

write an option Sell an option.

yield See *yield-to-maturity.*

yield curve The relation between the yield-to-maturity and term-to-maturity for bonds with a comparable degree of default risk (usually U.S. government securities).

yield risk A producer's uncertainty about the amount of commodity that will be produced in the future.

yield-to-maturity The discount rate that equates the present value of the bond's cash flow stream to its market price.

zero-coupon bond A bond that makes no interest or coupon payments. Also called a pure discount bond.

zero-coupon yield curve See *term structure of interest rates*.

zero-sum game A game in which payoffs to all players sum to zero (i.e., one person's win comes with another's loss).

About the CD-ROM

INTRODUCTION

This appendix provides you with information on the contents of the CD that accompanies this book. For the latest and greatest information, please refer to the ReadMe file located at the root of the CD.

SYSTEM REQUIREMENTS

- A computer with an Intel Pentium processor running at 233 MHz or faster (Intel Pentium III recommended)
- 128 megabytes (MB) of RAM or greater
- Microsoft Windows 2000 with Service Pack 3 (SP3), Windows XP, or later
- Microsoft Excel 2003
- A CD-ROM drive

NOTE: Older versions of Microsoft Excel may also work, but are not guaranteed. Many popular spreadsheet programs are capable of reading Microsoft Excel files. However, users should be aware that a slight amount of formatting might be lost when using a program other than Microsoft Word.

USING THE CD WITH WINDOWS

To install the items from the CD to your hard drive, follow these steps:

1. Insert the CD into your computer's CD-ROM drive.
2. The CD-ROM interface will appear. The interface provides a simple point-and-click way to explore the contents of the CD.

If the opening screen of the CD-ROM does not appear automatically, follow these steps to access the CD:

1. Click the Start button on the left end of the taskbar and then choose Run from the menu that pops up.
2. In the dialog box that appears, type ***d*:\setup.exe**. (If your CD-ROM drive is not drive d, fill in the appropriate letter in place of *d*.) This brings up the CD Interface described in the preceding set of steps.

WHAT'S ON THE CD

The CD contains two subdirectories: Content and OPTVAL.

Content

The Content subdirectory contains end-of-chapter questions and problems as well as Microsoft Excel files that contain data for use on end-of-chapter problems. The contents of each of the Excel files are described in the end-of-chapter problem.

OPTVAL™

The accompanying book, as well as the end-of-chapter problems on this CD ROM, makes extensive use of OPTVAL™. OPTVAL is a library of Microsoft Excel Visual Basic Add-Ins designed to perform a wide range of valuation, risk measurement, and statistical computations. The logic in doing so is simple. By facilitating the computation of value/risk, the OPTVAL functions allow the reader to focus on the economic understanding of solving the valuation and risk management problems rather than the computational mechanics of valuation and risk measurement.

More specifically, accurate and reliable valuation/risk measurement has two important computational steps. The first is performing all of the computations that go into generating a model value conditional on knowing the values of the model's parameters. In some instances such as valuing a simple forward or futures contract, the numbers of intermediate computations are hundreds, perhaps, thousands. In other instances such as valuing an option on a dividend-paying stock, they are many. The second is estimating model parameters. All valuation models are function analytical or numerical functions of a set of parameters. Reliably estimating many of these parameters such as expected future return volatility involves collecting histories of price data and then applying statistical techniques. OPTVAL also contains a host of statistical functions to supplement what is already available in Microsoft Excel.

The add-in functions contained in OPTVAL are introduced and applied in each chapter's illustrations. In the early chapters of the book, the illustrations show all of the intermediate computations involved in addressing the valuation/risk measurement problem at hand as well as the OPTVAL function that allows the reader to find the solution without seeing the intermediate computations. This two-step procedure is designed to allow the reader to develop confidence that OPTVAL functions are not merely a "black box" but rather a set of computational routines that the reader can verify, if he or she chooses to do so. As the chapters progress, less emphasis is placed on showing intermediate steps and more emphasis is placed on addressing important, everyday valuation/risk management problems.

Installing Add-Ins on Your Computer

Before you can use an add-in, you must first install it on your computer and then load it into Excel. Add-ins (*.xla files) are installed by default in one of the following places:

- The Library folder or one of its subfolders in the Microsoft Office/Office folder.
- The Documents and Settings/<user name>/Application Data/Microsoft/AddIns folder.

The administrator for your company's network can designate other locations for add-in programs. See your administrator for more information.

Loading Add-Ins into Excel

After installing an add-in, you must load it into Excel. Loading an add-in makes the feature available in Excel and adds any associated commands to the appropriate menus. To load the OPTVAL Function Library in Excel, go to the *Tools* menu and select *Add-Ins*. Select the OPTVAL Function Library and click *OK*.

Unloading Add-Ins from Excel

To conserve memory and improve performance, unload add-ins you don't use often. Unloading an add-in removes its features and commands from Excel, but the add-in program remains on your computer so you can easily reload it. When you unload an add-in program, it remains in memory until you restart Excel.

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