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Dictionary of Financial Engineering Terminology

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abandonment Allowing an option to expire unexercised. Generally this will happen only if the option is out-of-the-money at expiry or if the option is in-the-money at expiry by less than the transaction costs associated with exercising it.

ABS See *asset-backed securities*.

absolute advantage The ability of one country to produce more of a given good with its endowed resources. In the context of swaps, the ability of one party to borrow at a lower rate of interest in a given currency than another party. This is in contrast to comparative advantage. See also *comparative advantage* for contrast.

absolute priority rule The principle that senior creditors are paid in full before junior creditors are paid anything. Generally, this would require that secured creditors be paid first, then unsecured creditors, and finally equity holders.

absolute quotation The quotation of the rate on an instrument, such as the coupon rate on an interest rate swap, in which the quotation is an explicit rate such as 6.80%. This is in contrast to a quotation in the form of a spread over another instrument, such as a Treasury. The latter form of quotation is called a *relative quotation*. For example, suppose that the equivalent maturity Treasury to the swap quoted above is 6.20%. Then, if the swap is quoted at TN + 60 bps (i.e., the Treasury note yield plus 60 basis points), the quotation would be a relative quotation. See *relative quotation*.

academic arbitrage See *pure arbitrage*.

accelerated depreciation The depreciation of an asset at a rate faster than simple straight-line depreciation. Over the years, a number of different accelerated depreciation methods have been permitted under tax rules and generally accepted accounting principles (GAAP). Presently in the United States a method of accelerated depreciation called the modified accelerated cost recovery system or MACRS is the permissible method. Accelerating depreciation has the advantage of reducing reported profit in the years immediately following the purchase of new capital equipment, thereby reducing corporate income taxes and increasing corporate cash flow. However, by accelerating depreciation, out-year profits and taxes will be greater and cash flow will be lower than they would have been under straight-line depreciation.

acceleration A clause in a contractual obligation, such as a swap contract, that provides for the early termination of the contract with an appropriately specified termination process. Early termination is usually triggered by some credit event such as an outright default or a credit downgrading.

accounting risk The risk of variability in reported profits of a corporation or a bank as a consequence of a change in either the accounting rules or their interpretation. For example, users of derivatives for hedging purposes employ hedge accounting. For some years, the FASB debated new rules before releasing its FAS 133, which addressed the issue. FAS 133 itself is difficult to interpret and employ and dramatically changes the rules concerning hedge accounting. See *FAS 133*.

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accredited investor An investor who meets the requirements of Regulation D spelled out in the Securities Act of 1933 such that the investor may participate in the purchase of securities through private placements. Such investors must possess a minimum level of wealth and/or a minimum level of annual income and/or be prepared to invest at a substantial level. Sometimes called a *qualified investor.*

accreting notional swap Any swap in which the notional principal increases over time, under a prespecified schedule. Also known as an *accumulation swap*, an *appreciating swap*, a *step-up swap*, or simply an accreting swap. The opposite of an *amortizing swap*.

accretion An increase in the carrying value (i.e., the principal) of a security.

accretion bond A tranche of a CMO that does not receive interest or principal for some period of time. Instead, the interest that would otherwise flow to the tranche accrues. Once the tranche becomes the fastest-pay tranche, it begins to receive interest and principal. Such tranches are also known as *accrual bonds* and *Z bonds.*

accrual accounting An accounting system that recognizes revenue when the right to receive the revenue has been earned and recognizes expenses when obligations are incurred. This is in contrast to a cash accounting system that recognizes revenue when cash is received and expenses when obligations are paid.

accrual bond See *accretion bond*.

accrual note Also known as a *range note.* A type of medium-term note (usually three years) that pays a high rate as long as some short-term reference rate stays within a defined range, but pays a different and much lower rate whenever the reference rate strays outside the range. For example, an accrual note might pay a fixed rate of 8% while the T-bill rate stays between 5.50% and 6.50% but would fall to 2% should the T-bill rate go below 5.50% or above 6.50%. If the note pays a fixed rate when the reference rate is within the range and a different but fixed rate when the reference rate is outside the range, the note is called a *binary accrual note.* The illustration above is this sort of accrual note. The term *range floater* is used if the instrument pays a floating rate. See *range floater.*

accrual swap An interest rate swap in which interest accrual on one leg of the swap is conditional upon one or more specific conditions being met.

accrued interest The interest that has been earned by the holder of a debt instrument or interest rate derivative but which has not yet been paid. Rules for calculating accrued interest differ for different types of instruments and are very dependent on the interest accrual day count convention. The day count convention can be actual/actual, actual/360, or 30/360. See *day count*, *actual/actual*, *actual/360*, and *30/360.*

accumulation swap See accreting notional swap.

acquiree In an acquisition of one company by another, the company that is to be purchased or acquired is the acquiree. Prior to completion of the acquisition, the acquiree is often called the *target.* See also *acquirer.*

acquirer In an acquisition of one company by another, the company making the purchase is called the acquirer. The company that is purchased is called the *acquiree.* Prior to the completion of the acquisition, the acquirer is often de-

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scribed as a *suitor* (if the acquisition is friendly) or as a *raider* (if the acquisition is hostile). Prior to completion of the acquisition, the acquiree is called the *target*.

acquisition The purchase of one company by another company. The purchasing company is called the *acquirer* and the purchased company is called the *acquiree*. Acquisitions can result in a parent-subsidiary relationship or they can be a prelude to a merger.

act of God bonds Bonds, most often issued by insurance companies, that contain the following clause: If the issuer suffers significant losses, for example, due to excessive claims payout, the interest on the bond can be reduced or delayed without triggering default. Principal repayments may also be delayed without triggering default.

active portfolio management An effort by a portfolio manager to buy securities that are expected to outperform some benchmark and to sell securities that are expected to underperform the benchmark in order to generate performance for the portfolio that exceeds the benchmark's performance. This is in contrast to passive portfolio management, which simply seeks to match a benchmark by replicating the contents of the benchmark.

actual rate swap Also known as a *zebra basis risk swap* or *zebra swap* and sometimes called a *perfect swap*. A swap, usually involving a municipality that has issued floating rate debt, such that the municipality pays a fixed rate and receives a floating rate that precisely offsets the floating rate it contracted to pay on its floating rate debt.

actual/360 A day count convention that counts the actual number of days that have elapsed since the start of an interest accrual period and then divides this number by 360 as part of the process for determining the amount of interest that has accrued on a debt instrument. This day count convention is used, for example, in calculating the interest due on Eurodollar deposits, CDs, and repurchase agreements.

actual/actual A day count convention that counts the actual number of days that have elapsed since the start of an interest accrual period and then divides this number by the actual number of days in the entire interest accrual period or in the entire year (depending on the application and the type of instrument). This day count convention is employed in calculating the accrued interest on coupon-bearing U.S. Treasury notes and bonds, but not on U.S. Treasury bills.

actuals Also known as *physicals* and as *spot*. The term is used to distinguish between commodities and securities that are real and those that are purely hypothetical. The latter are known as *notionals*.

actuarial rate A rate of return that is expected to be earned. It is used to calculate the contributions to be made to a pension plan or the premiums to be paid on an insurance policy.

ad valorem tax A tax based on value, such as a tax on the value of real estate or personal property.

adaptive mesh model A lattice-like numerical process for valuing derivative instruments, such as options, in which regions of high resolution are embedded in critical regions of a lower resolution structure. Developed by Figlewski and Gao.

add-on factor Part of the bank capital guidelines adopted by the Federal Re-

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serve in 1989. In the case of swaps and other off–balance sheet positions, it is a percentage of the notional principal and is intended to provide for an increase in market risk that might occur over time. This measure predates the later approach to regulatory capital that is based on VaR and VaR-like measures.

add-on interest Interest that is paid at the end of a loan. That is, at the end of the loan period, the borrower repays the lender the principal and pays the lender the accrued interest. Sometimes called *add-on yield*.

add-on yield See *add-on interest*.

adjustable rate debt See *floating rate debt*.

adjustable rate instruments Any of a variety of instruments in which the rate payable on the instrument adjusts periodically to reflect the value (possibly with a premium or discount) of some reference rate of interest. This includes adjustable rate preferred stock, floating rate debt, floating rate notes, and adjustable rate mortgages, among others.

adjustable rate mortgage Known by the acronym *ARM*. Any mortgage contract containing a provision to reset the mortgage coupon rate in response to a change in market rates. The coupon is usually tied to a specific reference rate or index such as the one-year constant maturity Treasury or the eleventh district cost of funds.

adjustable rate note See *floating rate note*.

adjustable rate preferred stock Preferred stock in which the preferred dividend rate adjusts periodically based on some benchmark reference rate.

adjusted strike price A strike price on an option that has been adjusted to preserve the original economics of the option. For example, if an option is written on a stock and the underlying stock splits 2 for 1, then the strike of the option will be adjusted by dividing the original strike by two. The number of options will double, or, alternatively, the number of shares of underlying will double. The new strike price is the adjusted strike price.

adjustment swap See *off-market swap*.

ADRs See *American depositary receipts*.

advance contract See *forward contract*.

advance guarantee Essentially an option, but usually written into some other instrument. See *embedded option*.

advance refunding bonds Bonds issued to refund an outstanding bond issue prior to the date on which the outstanding bonds become due or callable. The proceeds of an advance refunding are held in escrow by a fiduciary and invested in authorized securities until such time as they are used to retire the earlier bond issue.

affected party A counterparty to a swap that has experienced a termination event.

affiliates Holders of greater than 5% of the common stock of a company (i.e., either individuals or corporations).

after market The secondary market for a security after completion of the initial public offering.

after-tax yield A measure of return, stated on a percentage basis, calculated after the payment of taxes. This measure is useful for comparing the returns

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on investments subject to different tax treatments.

agency cost A term used in corporate finance to describe the fact that directors, officers, and managers of a corporation are agents of the owners (i.e., agents of the shareholders). As such, they are expected to make decisions that will maximize the value of the corporation. However, because the agents might put their own interests, to some degree, ahead of the interests of the owners, the corporation's value may be lower than the maximum attainable value. The difference between the maximum attainable value and the actual market value is called agency cost. The elimination of agency cost has been used to justify leveraged buyouts by management.

agency trades Securities transactions by and between broker-dealers as opposed to stock exchanges or other markets or investors.

agent A person who acts on behalf of another for a fee. The agency relationship involves a fiduciary obligation on the part of the agent to act in the best interest of the principal who is paying the agent's fee.

agreement value method One of three allowable methods for determining damages upon the early termination of a swap. This method is now almost universally employed in swap documentation. The method assesses damages based upon market quotations for obtaining a replacement swap having equivalent terms to the terminated swap.

AIMR See *Association for Investment Management and Research*.

ALCO See *asset/liability management committee*.

algorithm Any process consisting of a well-defined sequence of steps that if followed exactly will lead to the correct numerical solution to a problem, provided that the problem has been correctly specified.

alligator spread See *butterfly spread (options)*.

all-in cost The total cost of a financing expressed as an annual percentage rate. In addition to the coupon, all-in cost reflects such things as flotation costs, trustee expenses, and administration expenses. It is useful for comparing the cost of several financing alternatives.

all-or-nothing Any financial instrument that pays either all of some specified value or nothing at all, depending on some specific condition. Such instruments have an option-like component and are constructed from digital options.

all-or-nothing options These are call (put) options that have a payoff equal to the full value of some market price if the value of the underlying at expiration is greater than (less than) the strike price of the option. If not, they pay off nothing. They can be structured to be multi-period, in which case they are all-or-nothing caps or floors. They are constructed from digital options. An example of an all-or-nothing call: If $S>X$ pay S; if $S \leq X$ then pay 0.

alpha (1) In regression analysis, alpha is often used to mean the estimated parameter that represents the intercept term. The estimated parameter representing the slope is called the beta. (2) In portfolio theory, alpha refers to the excess return earned on a security or portfolio relative to what should have been expected given the amount of systematic risk associated with the security or portfolio. In this context it is

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often called Jensen's alpha. (3) In the U.K., the largest corporations are often referred to as the alpha class of stocks—analogous to Blue Chips in the U.S.

alternative currency option See *dual currency option*.

alternative minimum tax Known by the acronym *AMT.* A U.S. tax levied on individuals who have substantial tax preference items in order to ensure that they incur at least some tax obligation. The AMT must be computed by individuals with certain tax preferences and then compared to the regular income tax. The larger of the two taxes is the tax that must be paid.

alternative options See *better-of options* and *worse-of options*.

Altman z score A numeric value assigned to a corporation that is used to predict the likelihood of the corporation's bankruptcy within a specific period of time. The equation for arriving at the score was obtained via discriminant analysis, through empirical econometric estimation. It uses several financial ratios as inputs. The method has been criticized for (1) lack of a theoretical model, and (2) failure to adjust the input ratios to reflect the accounting elections made by the corporation's management. The method is named for its developer Edward Altman.

American depositary receipts Better known by the acronym *ADRs.* These are securities that represent claims against shares of stock that trade in non-U.S. markets. The foreign securities are purchased and held by a depository institution as custodian. The depository institution then issues depositary receipts against the securities. These trade in the same manner as U.S. stocks. Each ADR gives its holder a pro rata claim on the shares of the foreign security. The depository institution collects any dividends paid by the underlying stock, converts them to dollars, and then distributes the currency-converted dividend to the ADR holders. Most often, a depositary receipt represents a single foreign stock, but sometimes a number of stocks will be pooled and then depositary receipts will be issued against the pooled securities.

American option An option that can be exercised at any time up to the time of its actual expiration. That is to say, American-type options are continuously exercisable by the option holder. This is in contrast to European-type options, which can be exercised only during a short period of time at the end of their lives.

American terms A method of quoting an exchange rate in terms of the number of dollars one unit of the foreign currency will buy. For example, if the euro is quoted at $1.05000, the quote is in American terms. From the perspective of an American, the quote can also be said to be in *direct terms.* This is in contrast to a quotation in European terms (also called indirect terms) in which the quote is in terms of the number of units of the foreign currency that can be purchased for one dollar.

American window A hybrid between a European-type option and an American-type option. This type of option allows the holder to exercise the option during a limited period of time (the window), which is generally toward the end of the life of the option. The window is longer than the very limited exercise period on a European-type option, but shorter than the entire life of the option as in an American-type option.

amortization (1) The process by which the principal on a loan or the notional

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principal on a derivative grows progressively smaller with the passage of time because the principal is either repaid (in the case of a loan) or simply reduced (in the case of a derivative). (2) The process by which the premium paid for a bond or other instrument is written down over time. (3) The process by which the value of an intangible asset, such as a patent, is gradually written down for tax purposes.

amortization of premium An annual charge against the premium paid for a bond in excess of its par value.

amortization schedule A schedule that describes how the principal on a loan or a notional contract will be amortized by listing the repayments or reductions of the principal. Such schedules usually also depict the interest payments and the total payments (principal and interest combined).

amortizing See *amortizing debt*.

amortizing cap A cap option on which the notional principal amortizes.

amortizing collar A collar option (see *collar*) on which the notional principal amortizes.

amortizing debt Any form of debt in which the principal balance is repaid gradually over the term of the loan.

amortizing loan A loan that is paid off in equal periodic payments. The payments are applied to principal and interest in varying portions over the life of the loan. The typical example is a home mortgage loan.

amortizing option Any type of option on which the notional principal (i.e., the quantity of underlying) gets smaller over time.

amortizing swap Any swap in which the notional principal amortizes over the tenor of the swap. Thus, interest exchanges are made on a progressively smaller notional principal.

AMT See *alternative minimum tax*.

analytic valuation methods Methods of valuing options or other derivative instruments that rely on the rigorous derivation of a formula (i.e., an equation). The derivation requires a clear enumeration of the relevant assumptions and then the careful derivation of the formula from these assumptions. It is not always possible to derive an analytical solution to a valuation problem, in which case, numeric valuation methods are employed. The famed Black-Scholes-Merton model was the first successful attempt at deriving analytical models for valuing options.

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anchors Frequently priced benchmark bonds that are used to price infrequently traded bonds through a matrix pricing approach. For example, all other things being equal, if a two-year anchor bond is at 96 and a four-year anchor bond is at 98, then a non-trading three-year bond is worth 97. Note that this description is an oversimplification because a bond can have many different features including coupon rates. Matrix pricing is one way to mark non-trading bonds to values approximating the market values the bonds would have if the bonds did trade.

and interest The normal way in which bond prices are quoted in the United States. Accrued interest is not included in the price quote and thus the bond buyer pays the bond seller the agreed price and any accrued interest. This contrasts with quotes on a flat basis that do include accrued interest.

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announced deals Publicly announced efforts to make acquisitions, engage in mergers, and achieve other forms of business combinations, in contrast to rumors of planned deals.

annual yield A yield that assumes one compounding per year. Also known as an effective annual yield.

annualization See *annualizing*.

annualizing Also known as *annualization*. The conversion of a percentage return earned over any holding period to its annual equivalent. The conversion generates an effective annual rate. Suppose that over some period of time T, the cumulative total return was R. Then the effective annual rate R_e can be found as follows: $R_e = (1 + R)^{1/T} - 1$.

annuity A series of equal-sized payments made at equal intervals in time. Many cash flow streams take the form of annuities. For example, the monthly payments on a level-payment fixed rate mortgage or the coupon payments on a fixed-rate bond would both represent annuities.

annuity bond An amortizing bond that makes equal-sized payments at regular intervals over the life of the bond such that each payment includes both interest and principal. By maturity, the full principal has been repaid so that no bullet principal payment is due at the end of the life of the bond. The amortization process is analogous to that of a conventional mortgage.

annuity note See *annuity bond*.

anticipatory hedge Any hedge that is put on in anticipation of a later cash position. The purpose is to lock in the price prior to taking the actual cash position.

anti-crash warrant A call-like warrant written on an index in which the strike price is equal to the smaller of the value of the index at issuance or the value of the index at a specific time in the future. Essentially, we have to look back to see which index value was the lowest in order to set the strike. See *look-back options* for a more general description of instruments with look-back features.

anti-takeover amendments Amendments to a corporate charter or corporate bylaws designed to place obstacles in the way of would-be acquirers. These include such things as supermajority voting requirements.

appraised value A fair market value assigned to an asset by an independent appraiser experienced at determining fair market values. Often important for assessing the value of an asset to be used as collateral on a loan and for calculating gains/losses on a merger when purchase accounting is used to account for the transaction. Appraised values are intended to be indicative of fair market value.

appreciating swap See *accreting notional swap*.

APT See *arbitrage pricing theory*.

arbitrage Simultaneously transacting in two or more markets in order to earn a profit from a price discrepancy between the two markets. The arbitrage can be across markets separated by space (geographical or spatial arbitrage), across time (temporal arbitrage), across tax rates (tax arbitrage), or across the structural components of the assets traded. In its purest form, arbitrage is risk free and requires no investment of the arbitrageur's own capital. Real world arbitrage, however, is rarely completely risk free and often requires considerable capital for infrastructure.

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arbitrage free A situation in which an arbitrageur cannot make a profit because the two instruments are not mispriced relative to one another. Sometimes understood to mean an efficient market. Alternatively, the absence of arbitrage opportunities.

arbitrage pricing theory Known by the acronym *APT.* A model for estimating security returns, particularly for stocks, that is based on systematic risk factors. These factors are captured by factor-replicating portfolios. The method represents a generalization of the capital asset pricing model (CAPM) and makes use of a statistical technique called factor analysis.

arbitrage profit A profit earned by exploiting a discrepancy between the pricing of an asset in two different markets. See *arbitrage* for more detail.

arbitrageur Also spelled "arbitrager." One who engages in arbitrage.

ARCH model See *autoregressive conditional heteroscedasticity model*.

arithmetic average annual return An average formed by dividing the sum of successive annual percentage returns on an investment by the number of years. This form of calculating an average annual return can be very misleading, particularly when the annual returns are volatile. For example, if the annual returns on an investment for the last four years were +20%, –20%, +16% and +40%, the arithmetic average annual return would be 14%. A more reliable measure is the *geometric average annual return*. See *geometric average annual return* for comparison.

ARM See *adjustable rate mortgage*.

ARPS See *auction rate preferred stock*.

arrangement fee A fee charged by an agent for arranging a financial transaction. Analogous to a *commission*. Sometimes called a *structuring fee* if financial engineering is involved.

arrearage The amount of any past due obligations, such as interest on bonds or dividends on preferred stock.

arrears An obligation to make a payment at the end of a payment period. This is the normal practice, for example, in the bond markets where the coupon interest is paid at the end of the coupon period.

arrears swap A swap in which one set of payments is based on an observation made at the end of the relevant period by looking back. Total return swaps are typically structured as in-arrears swaps but not all in-arrears swaps are based on a total return.

ascending yield curve See *upward sloping yield curve*.

Asian option See *average rate option* and *average strike option*.

ask Also known as an *offer price* and as an *asked price*. This is the price at which a dealer will sell an asset. In contrast, a *bid price* is the price at which a dealer will buy the asset.

asked price See *ask*.

assessed value The value placed on property by an assessor for purposes of levying taxes. Assessed values can differ significantly from true market values or appraised value and are not, necessarily, meant to be indicative of market value.

assessment ratio The ratio of the assessed value of real estate or other property to its true market value.

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asset allocation The process of dividing investment funds among different asset classes. Asset classes can be defined broadly, such as stocks and bonds, or narrowly, such as investment grade corporate bonds, Treasury bonds, high-yield bonds, and so forth. See *strategic asset allocation* and *tactical asset allocation.*

asset allocation swap Any of a variety of swap structures that are intended to effect an asset allocation strategy. For example, an equity swap in which the equity leg pays the higher of the total return on two equity indexes.

asset class A group of assets that share some general characteristic. For example, real estate makes up an asset class, common stocks of U.S. corporations make up an asset class, and U.S. bonds make up an asset class. Asset classes can be broadly or narrowly defined. For example, a broad asset class can be subdivided into numerous subclasses.

asset swap Any swap written to transform the cash flow characteristics of an asset in order to replicate the cash flow characteristics of another asset. The combination of the original asset together with the swap often constitutes a synthetic instrument. Also used to describe a package consisting of a bond and a pay-fixed/receive-floating interest rate swap, which has the effect of replicating a floating rate note.

asset-backed commercial paper Commercial paper backed by specific assets of its issuer. Asset-backing of commercial paper allows poorer quality corporations to utilize the commercial paper market. This is in contrast to most commercial paper, which is unsecured and issued by high quality issuers. See also *credit-supported commercial paper.*

asset-backed securities Known by the acronym *ABS.* These are bond and note issues collateralized by a cash flow stream that can be associated with almost any well-defined source (e.g., credit card receivables, auto loan receivables, etc.). Mortgage-backed securities are now viewed as a subset of the asset-backed securities market. The process of packaging a pool of claims on a cash flow stream into a security is often called *securitization.* Generally, a corporation holding assets that represent claims to future cash flows transfers ownership of those assets to a backruptcy-remote, special-purpose vehicle, which then issues bonds collateralized by those assets. Various techniques can be used to enhance the credit quality of the ABS.

asset/liability management The management of assets and/or liabilities in such a way as to match cash flows, currency denominations, durations, or maturities of assets and liabilities in order to manage exposure to price risks (i.e., interest rate risk and exchange rate risk).

asset/liability management committee Usually abbreviated *ALCO.* Groups of individuals at banks and other financial institutions with broad authority to manage the risks taken on by those institutions.

asset-or-nothing options Options that pay off the full market value of an asset if the option is in-the-money at expiry and nothing if the option is out-of-the-money at expiry. These options are also known as *all-or-nothing options.* See also *all-or-nothing options.*

assignment (1) The transfer of one's rights and obligations under a contract to another party. (2) The notice to an option writer that the option holder has elected to exercise the option.

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Association for Investment Management and Research Known by the acronym *AIMR*. A professional body that promulgates guidelines, disclosure requirements, return calculations, and performance presentation standards for persons involved in the investment management field.

asymmetric margining Any situation in which one party to a contract is required to tender more margin (i.e., collateral) than the other party to the contract either because the contract has an asymmetric payoff (as in the case of an option) or because the creditworthiness of the parties differ.

as-you-like-it option Also known as a *chooser option*. See *chooser option*.

at-market swaps Swaps written with a swap coupon (i.e., fixed rate) that reflects current market conditions. That is, the fixed rate leg has the same present value as the floating rate leg. These are also called *par swaps*, and they contrast with *high coupon swaps* and *low coupon swaps*, which are written off market.

at-the-close Also called *on-the-close*. Orders to buy or sell an asset during the period of time that constitutes the market's official closing period. Orders filled during this period must be filled at a price that falls within the *closing range*.

at-the-money A situation in which an option's strike price and the current market price of the underlying asset are the same, thus there is no intrinsic value. Also sometimes used to describe an asset trading at its par value, such as an interest rate swap whose fixed rate reflects current market conditions.

at-the-open Also called *on-the-open*. Orders to buy or sell an asset during the period of time that constitutes the market's official opening period. Orders filled during this period must be filled at a price that falls within the *opening range*.

auction calendar The calendar schedule for the regular auction of Treasury securities.

auction rate preferred stock Often referred to by the acronym *ARPS*. Preferred stock in which the coupon rate periodically resets, most often once every 49 days, based on the outcome of a Dutch auction. The rate is usually subject to a cap and the instrument is often putable. The instrument goes under a variety of labels each representing a trademark of a financial institution.

authorized shares The number of shares of common stock a corporation has been authorized by its charter to sell. However, just because the corporate charter authorizes the sale of shares does not mean that the corporation must issue the shares or that it can do so without registering the shares with the SEC.

autocorrelation A situation in which a series of successive observations on a random variable (i.e., a time series) are correlated with, and therefore partially or wholly dependent upon, one another. In such a situation, the successive values generated provide some aid in predicting the future values that will be generated. Many statistical techniques are predicated on the assumption that time series are not autocorrelated. Autocorrelation is also known as *serial correlation*.

automatic exercise A policy on the part of a clearing member of an option's exchange by which the clearing member will always exercise an option on behalf of the option's owner if the option is in-

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the-money by a preset amount at expiry. The purpose is to prevent options that are in-the-money from expiring worthless because of the option holder's inattention.

autoregressive conditional heteroscedasticity model Known as an *ARCH model.* A statistical process for estimating the parameters of a relationship among variables where the process models the value of the dependent variable as a function of the time-varying properties of the error terms.

average life A measure of the average length of time it will take, or is expected to take, to recover the principal on a debt security. Unlike duration, average life is calculated with respect to principal only and does not discount the principal payments in the averaging process. Often used as an alternative to maturity on amortizing instruments.

average price option Similar to an average rate option, except that the average price of the underlying asset, rather than the average reference rate, is compared to the option's strike price. See *average rate option.*

average rate option An interest rate or exchange rate option that pays off by comparing the average underlying reference rate (calculated based on a series of discrete observations on the reference rate over the life of the option) to the strike price of the option. Such options can be calls or puts. Average rate options are one type of *Asian option.* For example, a call version of such an option might have a payoff given by $max[R_{avg} – X, 0]$ where R_{avg} represents the simple average of a number of observations on the reference rate over some period of time, and X denotes the option's strike rate.

average strike option An option that pays off based on comparing the spot price of the underlying at settlement to the average spot price of the underlying over the life of the option. The average spot price serves as the strike of the option, thus the strike is floating over the life of the option. Such options can be calls or puts. For the call variety, the payoff would be given by $max\ [S_T – S_{avg}, 0]$ where S_T denotes the spot price at option expiry, and S_{avg} denotes the simple average of the spot price over the life of the option based on a number of observations (such as daily closing prices).

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B

baby bond A bond having a face value (i.e., par value) of less than $1,000.

back months Derivatives contracts such as futures and options that have delivery dates or expiration dates that are far forward from the present. This is in contrast to the *front month,* which is the month closest to delivery or expiry. The term *far month* is often used to mean the same thing as back month and the term *near month* is often used to mean the same thing as front month.

back office In the banking industry, a reference to the various operational functions necessary to support the front office or revenue generating activities. Typical back office functions include payment processing, trade clearing and settlement, information technology support, legal and accounting support,

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confirmation generation, trade matching, and so forth.

back stub period The last payment period on a floating rate instrument (i.e., an instrument on which the rate periodically resets) if the length of that last payment period is different from that of the other payment periods. These instruments include interest rate swaps and floating rate notes. The back stub period, if there is one, is usually shorter than the other periods. There may also be a shorter first payment period, which would be called a *front stub period.*

back testing A process by which a trading methodology or other algorithm is tested against historic data to evaluate its usefulness. Often used to test value-at-risk models.

back-end load A load or sales charge paid when something is sold. The term is most often used to refer to sales charges imposed when shares of a mutual fund are sold. See *load* for a discussion of the different types of sales charges.

back-end set swap A swap in which the floating rate is observed at the end of the period and applied to the prior period. On a LIBOR-based swap, LIBOR would be observed at the end of the coupon period and then applied retroactively back to the beginning of the period. Also known as an *in-arrears swap.*

back-to-back loans A loan arrangement involving two distinct loans between the same parties. In the first loan, Party 1 is the lender and Party 2 is the borrower. In the second loan, Party 2 is the lender and Party 1 is the borrower. Back-to-back loans predate swaps and are the predecessor of swaps. They were first used to circumvent restrictions on capital movements.

back-to-back swaps Two swaps involving the same counterparty such that for that counterparty the swaps are in the opposite direction. For example, suppose that Party A is a swap dealer, Party B is a corporation, and Party C is a subsidiary of Party B. Suppose that Party C needs a swap to convert the character of a debt issuance. The dealer, however, is not comfortable with Party C's credit and won't do the swap with C. But the dealer is willing to do the swap with Party B. The dealer does a swap with B and then B does an offsetting swap with C. C now has the swap it needs, and B has back-to-back swaps.

backward induction Also known as a *roll back.* Any lattice (tree) methodology that starts with possible future values and discounts the values backward through the tree. At each node in the tree, the values are combined. As the process progresses, the tree narrows until the present value is ascertained. This method can be used to value a bond having embedded optionality from a tree of potential short rates. This is useful for determining a bond's option adjusted spread.

backwardation A situation in which the current spot price of an asset is higher than the current price of a futures contract written on that asset. This is in contrast to contango in which the futures price is higher than the spot price. See *contango* for contrast.

balance sheet An important financial statement prepared in accordance with generally accepted accounting principles (GAAP) that lists all of a corporation's assets at their book values and separately lists all of a corporation's liabilities and the owners' equity at their book values. These statements reflect the values as of a specific date. In recent years, there has been a movement toward changing the method of calcula-

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tion to focus more on market values and less on book values. Balance sheets are sometimes called *statements of financial position*. The term "balance sheet" stems from the fact that the book value of assets must equal the book value of liabilities and equity.

balloon (1) A fixed-rate mortgage that is scheduled to return the entire principal outstanding, or some large portion thereof, in a lump sum on a date prior to the time the mortgage would be fully amortized. (2) A bond issuance scheduled to return a large portion of the principal on some date prior to maturity. Debt service funds (a type of sinking fund) are often associated with such bonds to assure that sufficient funds will be available to meet the balloon obligation.

balloon payment The payment of the entire principal outstanding on a balloon mortgage or the payment of a substantial portion of the principal on a bond issuance.

band (1) An agreed-upon range over which the exchange rate between two currencies can move before government intervention is required. (2) Another name for a collar. See *collar*.

banded swap See *collar swap*.

bank basis See *bank discount basis*.

bank discount basis Also known as *bank basis* and as *discount basis*. The routinely used convention for quoting yields on Treasury bills and commercial paper. The yield is stated using an actual/360 day count convention with the assumption that the instrument is discounted from its face value by the amount of the interest. See also *bank discount yield*.

bank discount yield Also known as *discount basis*. A measure used to express the yield on certain non-coupon-bearing securities, such as T-bills, that always sell at a discount from face value.

Bank for International Settlements Known by the acronym *BIS*. An organization involving the central banks of many countries that is principally concerned with settling payments among nations.

bank guarantee Any guarantee by a bank on behalf of a customer such that the bank's credit replaces the customer's credit with respect to a specific transaction. Letters of credit are a form of a bank guarantee.

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banker's acceptance A money market instrument created as a consequence of commercial transactions. Essentially, a bank letter of credit is issued to support a commercial transaction. When the transaction is complete, the letter of credit is stamped accepted and becomes payable at face value at a specific point in the future. Until that time, it is marketable and trades at a discount from its face value.

Banking Act of 1933 More popularly known as the *Glass-Steagall Act*. While this legislation had a number of important provisions, it is best known as the legislation that divided the financial services industry into three distinct industries: investment banking, commercial banking, and insurance. The act limited a financial institution's activities to one of these three arenas and greatly shaped the evolution of the U.S. financial services industry. The Financial Services Act of 1999 repealed or modified many of the provisions of Glass-Steagall.

bankruptcy (1) Technically, a situation in which the value of a firm's liabilities

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exceeds the value of the firm's assets so that the firm has negative equity. However, because a balance sheet is usually prepared using book values, technical bankruptcy does not necessarily imply that a formal declaration of bankruptcy will occur. (2) A declaration of bankruptcy is a declaration that a corporation is unable to satisfy its liabilities because it has inadequate assets and/or income and usually leads a corporation to seek protection from creditors under various provisions of the bankruptcy code.

bankruptcy remote entity An entity created to serve as the issuer of structured financial instruments (such as asset-backed securities). The bankruptcy remote entity is usually a special purpose vehicle and is a subsidiary of another entity that seeks to pool and sell assets. Such special purpose vehicles are structured to have a very low probability of bankruptcy, even if the parent should go bankrupt.

BANs See *bond anticipation notes.*

barbell portfolio A portfolio of bonds that is concentrated in two securities, one with a relatively long duration and one with a relatively short duration. Both positions are held long or both positions are held short, so that the duration of the portfolio is a weighted average of the two extreme durations.

barrier options Options that are triggered when an underlying asset price crosses a given price level, called the *barrier price.* Barrier options are path dependent. There are two general types: knock-in and knock-out. When the spot price crosses the barrier price, knock-in options are activated and knock-out options are extinguished. Barrier options are also known as *trigger options* and *limit options.*

barrier price The barrier price specified in a barrier option that causes the option to knock in or knock out. See *barrier options.*

base currency See *functional currency.*

baseball option A knock-out barrier option that knocks out if the barrier price is touched or crossed three times. The option knocks out upon the third touch. The term derives from the game of baseball in which three strikes make an out.

baseline instrument Also know as a *benchmark* instrument. An instrument selected to serve as the benchmark to which other instruments are compared. In hedging strategies, the benchmark instrument functions as a kind of common denominator for a portfolio. That is, the positions within the portfolio are each converted to their risk equivalents in terms of the benchmark. They can then be aggregated to determine the overall risk of the portfolio.

basic See *plain vanilla.*

basic swap See *plain vanilla.*

basis (1) Most generally, the difference between two prices or rates. More narrowly, the difference between the spot price (or rate) of the underlying asset and a futures price (or rate) on the underlying asset. When a futures hedge is placed, the hedger trades price risk for basis risk. See *basis risk.* See also *quality basis, locational basis,* and *time basis.* (2) The adjusted cost of a capital asset for purposes of calculating capital gains and losses. See *cost basis.*

basis point A measure of interest rate changes or differences. A single basis point is 0.01% so that it takes 100 basis points to make 1 percentage point. Interest rate spreads are most often quoted in basis points. Often abbreviated bps

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and, in market jargon, pronounced "bips" or "beeps."

basis rate swaps See *basis swaps*.

basis risk The potential for changes in a basis. It is measured as the standard deviation of the basis. The basis is the difference between two prices, most often a spot price and a futures price. Basis risk is a function of the degree of correlation between the two prices. When a commercial interest hedges, it essentially exchanges price risk for basis risk. In the case of hedging a position in a commodity (including financial instruments) with futures contracts, the basis risk can be ascertained from the following relationship:

$$\sigma_{basis} = [(1 - \rho) \times 2\sigma^2_{spot}]^{1/2}$$

where σ_{basis} denotes the standard deviation of the basis, ρ denotes the degree of correlation between the spot price and the futures price, and σ^2_{spot} denotes the variance of the spot price. It can be seen that the hedge will be completely effective if the correlation is perfect (i.e., +1). The lower the correlation, the higher the basis risk and, therefore, the less effective the hedge.

basis swaps Contracts to exchange interest payments based on different reference interest rates such as the exchange of LIBOR-based cash flows for Treasury bill rate-based cash flows. That is, they are floating-for-floating swaps in which the two legs pay based on different reference rates. Also known as *basis rate swaps*.

basis trade Any transaction based on the difference between two prices. Such a trade might involve the exchange of a futures contract for the underlying asset (called physicals or actuals). Basis trades are often at the heart of arbitrage strategies.

basket A portfolio containing a specific combination of assets. For example, we could have a currency basket, a stock basket, or a commodity basket.

basket hedging A hedge constructed from a basket of assets (see *basket*) to offset the risk associated with positions in a variety of actuals.

basket options Include *sector options* and *sector warrants* as special cases. Options in which the underlying is a custom-made portfolio of equities, currencies, commodities, or bonds. That is, the option pays off based on a basket of instruments rather than on a single instrument. There is a difference between a basket of options (each written on a single underlying) and an option on a basket of underlyings. A basket option refers to the latter. For example: Suppose three stocks trade for $50, $40, and $90. Call these stocks 1, 2, and 3, respectively. The equally weighted average price of these three stocks is $60. Now suppose we buy an at-the-money call option on an equally weighted basket of these three stocks. The option would pay off at expiry as follows: *max* $[(\frac{1}{3}\Sigma S_i - 60), 0]$.

basket rate A rate formed from a portfolio of rates. A basket rate can be used as the reference rate on a swap.

Basle Accord An agreement in principle reached in December 1987 by the Basle Supervisors Committee that redefined bank capital requirements (i.e., regulatory capital). Subsequent work by the committee led to progress toward basing regulatory capital on the level of the bank's risk exposure.

Basle Supervisors Committee A group of bank supervisors and regulators that met in Basle, Switzerland, to redefine bank capital and to standardize capital requirements for banks.

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BBA See *British Bankers' Association*.

BBAIRS Pronounced "B bears." Refers to British Bankers' Association Interest Rate Swap Documentation.

BDT See *Black-Derman-Toy*.

bear floater A floating rate note whose rate is based on the difference between some multiple of a floating reference rate and a fixed rate. The note allows the investor to leverage up a bet that the reference rate is going to rise. Also known as a *leveraged floater.*

bear hug An effort at a friendly takeover that carries a threat of a hostile takeover if the overture for a friendly takeover is rejected.

bear spread A strategy involving two options of the same class (i.e. they are both calls or both puts) written on the same underlying asset and having the same expiration date. One option is bought and the other option is sold. If the strategy is effected using calls, you would buy the higher strike call and write (i.e., sell) the lower strike call. The payoff profile has the characteristic that the trader profits up to a preset amount if the underlying's price falls and loses up to a preset amount if the underlying's price rises. See *vertical spread.*

bear swap A swap in which the notional principal amortizes more rapidly if the swap's reference rate rises. This benefits the fixed rate receiver, who is able to reinvest at a higher rate.

bearer bond A negotiable bond whose title rests with the bearer. That is, it is presumed that the bearer of the bond is the rightful owner of the bond. This is in contrast to registered bonds in which ownership is continuously tracked. Bearer bonds were the standard form of bonds many years ago, but registered bonds are far more common today.

bearish Describes a person who believes that a particular asset or group of assets will fall in value. One who is bearish is inclined to sell the asset. This is in contrast to one who is bullish and believes the value of an asset will rise. With respect to interest rates, a bear believes that rates will rise thereby implying that bond prices will fall.

benchmark An instrument, index, or rate that will serve as a basis of comparison or from which an observation will be taken for purposes of setting a rate on a floating rate instrument. In the latter context, it is often called a *reference asset*, *reference index*, or *reference rate*. Benchmark portfolios, such as stock indexes and bond indexes, are also known as *normal portfolios.*

benefit of carry A situation in which the cost of carry on a futures contract or other position is negative so that the benefit of carry accrues to the arbitrager. This situation arises when the income earned from holding a security (e.g., coupon payments in the case of bonds, and dividend payments in the case of stock) exceeds the cost of financing the position.

Bermudan option Any option that is exercisable on discrete dates spread out over the option's life, but not exercisable between those dates. This is in contrast to American options, which are exercisable at any time, and in contrast to European options, which are exercisable only during a limited exercise period at the end of the option's life. Bermudan options are also called *mid-Atlantic options* and *quasi-American options.* These terms are all intended to convey the idea that the exercise period is somewhere between that normally associated with an American-type op-

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tion and that normally associated with a European-type option (i.e., Bermuda is between America and Europe).

best efforts A type of underwriting in which the issuer will receive the proceeds from an issuance of securities only to the degree that the issuance is successful. That is, the underwriting syndicate does not guarantee that all of the securities can or will be sold at the offering price and does not guarantee to the issuer that the issuer will receive the full amount of the *proceeds to the issuer.* In such an underwriting, the issuer bears the risk of a failed offering. For contrast, see *firm commitment*.

beta See *beta coefficient*.

beta coefficient A measure of the systematic risk associated with a single stock or a portfolio of stocks. Systematic risk is measured relative to the market. Most often, the market is taken to be the S&P 500 stock index. The beta of a security is computed as the covariance of the excess returns on the security and the excess returns on the market divided by the variance of the excess returns on the market. Excess return is the difference between the return on the stock (or the market) and the return on the risk-free rate.

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better-of options Also known as *alternative options*, but this latter term can also include worse-of options. An option that pays off based on the better performing of two or more assets or indexes. For example, the holder of a better-of call on the S&P 500 and the Nikkei 225 would receive the total return on the better performing of the two indexes or pay the least worst performing of the two indexes should they both produce a negative total return. The payoff function for such options would be given by $max[S_1, S_2, S_3,\ldots, S_n]$, where *max*[ ] denotes the max function and S_i denotes the value of the ith underlying at the time of the option's expiration. Closely related are worse-of options, which pay the worst performing of several assets or indexes. Better-of options fall within a broader category of options called *rainbow options*. Other types of rainbow options include *outperformance options* and *max-min options*. See these for their distinguishing features.

BEY See *bond equivalent yield*.

bid Also called *bid price*. The price quoted by a dealer at which he will buy an asset. This is in contrast to the dealer's offer price, which is the price at which he will sell an asset. The term can also be applied to interest rate contracts to refer to an interest rate at which the dealer will buy the instrument.

bid price See *bid*.

bid-ask spread Also called *bid-offer spread*. The difference between the bid price and the ask price for any marketed instrument. In dealer markets, the bid-ask spread is the dominant source of the dealer's income. In some markets, this is called the *pay-receive spread*.

bid-offer spread See *bid-ask spread*.

bifurcation The division of some aspect of an instrument into two parts. For example, we can bifurcate risks or cash flows. A bifurcation of risks might involve separating the credit risk from the market risk. A bifurcation of cash flows might involve separating a mortgage payment into its interest and principal components and directing those cash flows to different investors. The term is sometimes used with respect to analytical processes that have been broken into two distinct parts.