E

1. EAC Method

Equivalent annual cost method is used to do capital decision for projects with unequal lives. It equals to the NPV of cost divided by an annuity factor that has the same life as the investment. However, this method assumes that two alternative projects have same revenue. [For a general case, see **Equivalent annual NPV** and **Appendix D**]

2. EAFE Index

The European, Australian, Far East index, computed by Morgan Stanley, is a widely used index of non-US stocks.

3. Early Exercise

Exercise prior to the maturity date.

4. Early Withdrawal Penalty

An interest penalty a depositor pays for withdrawing funds from a deposit account prior to maturity.

5. Earning Assets

Income-earning assets held by a bank; typically include interest-bearing balances, investment securities, and loans.

6. Earnings Credit (Earnings Credit Rate)

The assumed interest rate at which a bank applied to customer's investable balances to earn interest income. Estimating investment income from balances involves four steps.

1. The bank determines the average *ledger (book) balances* in the account during the reporting period.
2. The average transactions float – uncollected funds that still appear as part of the customer's ledger deposit – is subtracted from the ledger amount. This difference equals *collected balances*.
3. The bank deducts required reserves that must be maintained against collected balances to arrive at investable balances.
4. Management applies an earnings credit rate against investable balances to determine the average interest revenue earned on the customer's account.

7. Earnings Dilution

A decrease in earnings per share after one bank acquires another.

8. Earnings Per Share

Net income divided by the number of outstanding shares of common stock.

9. Earnings Retention Ratio

It equals one minus pay-out ratio. [See also **Plowback ratio**]

10. Earnings Yield

The ratio of earnings to price, E/P.

11. EBIT

Earnings before interest and taxes.

12. EBIT/EPS Analysis

EBIT/EPS analysis allows managers to see how different capital structures affect the earnings and risk levels of their firms. Specifically, it shows the

graphical relationship between a firm's operating earnings, or earnings before interest and taxes (EBIT) and its earnings per share (EPS). Scenario analysis with different levels of EBIT can help analysts to see the effects of different capital structures on the firm's earnings per share.

EBIT/EPS analysis is an older tool that was first developed when accounting concepts dominated financial analysis. Also, most managers are familiar with the concept of earnings and are more comfortable discussing the impact of leverage on earnings rather than on cash flow.

Leverage obviously affects earnings per share. For low values of EBIT, the proposed capital structure leads to lower EPS than the current structure. For higher values of EBIT, debt works to the firm's benefit, as EPS is higher under the proposed capital structure than under the current structure.

EBIT/EPS analysis has several practical implications. First, it shows the ranges of EBIT where a firm may prefer one capital structure over another. Second, should the expected EBIT of the firm lie above the indifference EBIT level, the firm's managers should examine the standard deviation of their EBIT forecast. If there is a relatively high probability that the actual EBIT level may fall below the indifference level, management may decide to play it safe and use a more conservative financing strategy with less debt.

Third, a firm's level of business risk will affect its desired exposure to financial risk. Variations in firm sales lead to changes in EPS through the joint effects of operating and financial leverage, as given by the following relationship:

$$\mathrm{DOL} \times \mathrm{DFL} = \mathrm{DCL},$$

where DOL, DFL, and DCL represent degree of operating leverage, degree of financial leverage and degree of combined leverage, respectively.

A firm's DFL, or degree of financial leverage, is related to its choice of capital structure. Other things being equal, as a firm uses more debt to finance its assets, its degree of financial leverage rises.

There is no evidence that firms adjust their DOLs and DFLs to match some standard degree of combined leverage. This relationship does, however, imply a potential tradeoff between a firm's business and financial risk. Firms with volatile sales, variable price-cost margins, and large amounts of fixed operating expenses may prefer to use less debt in their capital structures. A firm with excessive risk will not attract stock or bond investors.

EBIT/EPS is a simple tool, and so it has a limitation it provides little insight into how financing decision affect shareholder wealth. Still, it provides managers with an idea of how different levels will affect earnings and earnings variability.

13. EBITDA

Earnings before interest, taxes, depreciation, and amortization.

14. Econometric Model

It is based on representations of the underlying economic behavioral system for a particular commodity. These representations attempt to identify and model the relevant supply-and-demand factors that together determine market price and quantity.

15. Economic Assumptions

Economic environment in which the firm expects to reside over the life of the financial plan. The economic condition can be classified as boom, normal, or recession.

16. Economic Earnings

The real flow of cash that a firm could pay out forever in the absence of any change in the firm's productive capacity.

17. Economic Income

Economic income is defined as the maximum value that a firm can consume in a given period and be as well off at the end of the period as it was at the

beginning. **Accounting income** measures only the changes in wealth caused by realized or recognized gains and losses, revenues and expenses. [See also **Accounting income**] Economic income measures changes in wealth based upon both realized and unrealized gains and losses. This is why the market value of the firm (its stock price) usually differs from its book value.

Theoretically, financial analysis should consider economic income rather than accounting earnings to determine the value of a firm, since economic income represents the firm's true earnings and cash flows. However, economic income is not directly observable. For that reason, analysts generally use accounting earnings as a proxy. The relationship between economic income and accounting earnings can be related by the following equation:

Accounting Income = Economic Income + Error.

18. Economic Value Added (EVA)

Economic value added (EVA) is a tool by which division managers can correct failures of accounting-driven or sales-driven evaluation systems. EVA addresses the shortcomings of these performance measures while at the same time including a cost most measures omit – the cost of capital, or the cost of financing the firm's operations with debt and equity. EVA is roughly equal to after-tax operating profit minus the firm's dollar cost of capital. If EVA is positive, management has added value to the firm; if it is negative, shareholder wealth has been harmed. In sum, EVA is a measure of financial performance trade-marked by Stern, Stewart & Co. equal to a firm's net operating profit after tax (NOPAT) minus a capital charge representing the required return to shareholders.

19. Economics, Relationship to Finance

The field of economics provides the basic framework within which managers make firm-level decision, since microeconomic decisions are implemented in the context of a dynamic, global macro economy. Like economics, finance employs the theory of rational decision making; like quantitative management science, finance does use some highly structured models and methods.

20. Economies of Scale and Economies of Scope

Economies of scale and high capital requirements typically go together. Scale economies occur as average production cost declines with rising output per period. Any new entrant must (1) have available financing to construct a large-scale factory and (2) be able to sell in sufficient quantity to be cost-competitive. Entry may be especially unattractive when the entrant considers the impact of added volume on market price; the increase in supply caused by a new entry may lower product prices, making it more difficult for the new entrant to compete in the market. Scale requirements can deter entry and promote positive net present value projects among existing firms. Economies of scope, in particular, refers to financial institution's abilities to generate synergistic cost savings through joint use of inputs in producing multiple products.

21. ECU

European Currency Unit.

22. ECU Swap

Used to transform principal and coupon payments denominated in European Currency Units into another currency, and vice versa.

23. Edge Act Corporation

A specialized organization form open to US domestic banks since 1919 and foreign banks since 1978. These banks specialized in international trade-related banking transactions or investments.

24. Effective Annual Interest Rate

A way of quoting an interest rate such that the quoted rate is the annual percentage increase in

an amount invested at this rate. If \$1 is invested at an effective annual rate of r, the payoff in one year is \$1+r. [See also **Effective annual rate**]

25. Effective Annual Rate (EAR)

The effective annual rate (EAR) sometimes called the *annual effective yield*, is the true opportunity cost measure of the interest rate, as it considers the effects of periodic compounding. If the periodic interest charge r is known, the EAR is found as:

$$EAR = (1 + r)^m - 1,$$

where $m =$ the number of compounding periods per year.

If the **annual percentage rate (APR)** is known instead, r is found by dividing the APR by m and compounding by m periods. [See also **Annual percentage rate (APR)**]

$$EAR = \left[1 + \frac{APR}{m}\right]^m - 1.$$

It is useful to distinguish between a contractual or stated interest rate and the group of rates we call yields, effective rates, or market rate. A contract rate, such as the annual percentage rate (APR), is an expression that is used to specify interest cash flows such as those in loans, mortgages, or bank savings accounts. The yield or effective rate, such as the effective annual rate (EAR), measures the opportunity costs; it is the true measure of the return or cost of a financial instrument.

26. Effective Annual Yield

Annualized interest rate on a security computed using compound interest techniques. [See also **Effective annual rate**]

27. Effective Convexity

The value for convexity that reflects the price impact of embedded options in different interest rate environments. [See also **Convexity**]

28. Effective Duration

The value for duration reflecting the price impact of embedded options when interest rates rise versus fall. In addition, it can also refer to percentage change in bond price per change in the level of market interest rate.

29. Efficiency Ratio

Noninterest expense divided by the sum of net interest income and noninterest income. This is an aggregate profitability measure for a bank.

30. Efficient Diversification

The organizing principle of modern portfolio theory, which maintains that any risk-averse investor will search for the highest expected return for any level of portfolio risk.

31. Efficient Frontier

Graph representing a set of portfolios that either (i) maximize expected return at each level of portfolio risk or (ii) minimize risk at each level of return.

32. Efficient Market

Unexpectedly good or bad news can cause assets' prices to change. Good news surprises lead market participants either to reduce the risk premium they demand of an asst (thus decreasing its required return) or to increase their expectations for future cash flows. Either reaction leads to an increase in an asset's price. Bad news surprises lead the market to demand a higher risk premium (and required return) or to reduce its expectations for future cash flows; either reaction results in a falling asset price.

If a market adjusts prices quickly and in an unbiased manner after the arrival of important news surprises, it is said to be an efficient market. If the market, for example, for IBM stock is efficient, we should see a quick price change shortly

after any announcement of an unexpected event that affects sales, earnings, or new products. A quick movement in the price of a stock such as IBM should take no longer than several minutes. After this price adjustment, future price changes should appear to be random. That is, the initial price reaction to the news should be unbiased, or, on average, fully reflect the effects of the news. Every time IBM's stock price changes in reaction to new information, it should show no continuing tendency to rise or fall after the price adjustment.

Any consistent trend in the same direction as the price change would be evidence of an inefficient market that does not quickly and correctly process new information to properly determine asset prices. Likewise, evidence of price corrections or reversals after the immediate reaction to news implies an inefficient market that overreacts to news.

In an efficient market, it is difficult to consistently find stocks whose prices do not fairly reflect the present values of future expected cash flows. Prices will change only when the arrival of new information indicates that an upward or downward revision in this present value is appropriate.

This means that in an efficient market, investors cannot consistently profit from trades made after new information arrives at the market. The price adjustment occurs so rapidly that no buy or sell order placed after the announcement can, in the long-run, result in returns above the market's average return. An order to buy after the arrival of good news may result in large profits, but such a gain will occur only by chance, as will comparable losses. Stock price trends always return to their random ways after initially adjusting to the new information.

Efficient markets result from interactions among many market participants, all analyzing available information in pursuit of an advantage. Also, the information flows or news they analyze must be random, both in timing and content (i.e., in an efficient market, no one can consistently predict tomorrow's news). The profit motive leads investors to try to buy low and sell high on the basis of new information and their interpretation of it. Hordes of investors analyzing all available information about the economy and individual firms quickly identify incorrectly priced stocks; resulting market pressures immediately push those stocks to their correct prices. In an efficient market, this causes prices to move in a **random walk**, meaning that they appear to fluctuate randomly over time, driven by the random arrival of new information. [See also **Random walk**]

33. Efficient Market Hypothesis (EMH)

The prices of securities fully reflect available information. Investors buying securities in an efficient market should expect to obtain an equilibrium rate of return. Weak-form EMH asserts that stock prices already reflect all information contained in the history of past prices. The semistrong-form hypothesis asserts that stock prices already reflect all past and current publicly available information. The strong-form hypothesis asserts that stock prices reflect all relevant information, including insider information.

34. Efficient Portfolio

If a portfolio is efficient, if there exists no other portfolio having the same expected return at a lower variance of returns. Moreover, a portfolio is efficient if no other portfolio has a higher expected return at the same risk of returns.

35. Efficient Set

Graph representing a set of portfolios that maximize expected return at each level of portfolio risk. Each point on an efficient set represents an efficient portfolio.

36. Elasticity

A measure of the relative quantity response to a change in price, income, interest rate, or other variable.

37. Elasticity (of An Option)

Percentage change in the value of an option accompanying a 1 percent change in the value of a stock.

38. Electronic Trading

System of trading where a computer is used to match buyers and sellers.

39. Electronic Transfer

An electronic transfer is essentially a high-tech, automated **depository transfer check (DTC)**. [See also **Depository transfer check**] To speed the cash transfer, an electronic check image is processed through clearinghouses rather than through a wire network. An electronic transfer is cheaper than a DTC and usually clears in a single business day.

40. Embedding Option

An option that is an inseparable part of another instrument. For example, bond with embedded options. Such bonds are debt exchangeable for common stock (DECS), premium equity participating shares (PEPS) and preferred equity redeemable for common stock (PERCS). All of these instruments are effectively bonds plus some options position.

41. Empirical Research

Research based in historical market data.

42. Employee Stock Ownership Plans

Employee ownership can help align the incentives of *all* the firm's workers with those of the shareholders. Employee stock ownership plans (ESOPs), if correctly implemented, can make all employees think and act like owners. As part of the ESOP, employee participation groups (comprised of members elected by fellow employees) meet regularly to discuss ways to increase productivity and the firm's value and, therefore, the value of the employees' stake. About 10,000 firms, many of them privately owned, currently have ESOPs in place.

ESOPs can be difficult to implement for an international firm. Some countries ban stock options or limit ownership of foreign shares. For a firm residing in such a country, an ESOP plan needs to be designed to meet specific, local requirements.

43. EMU

European Monetary Union. There are eleven eurozone countries. In this union, the European Central bank sets the monetary policy.

44. End-of-Year Convention

Treating cash flows as if they occur at the end of a year (or, alternatively, at the end of a period), as opposed to the date convention. Under the end-of-year convention, the end of year 0 is the present, end of year 1 occurs one period hence, and so on.

45. Endowment Funds

Organization chartered to invest money for specific purposes.

46. Enhancement

Enhancement is less common than **cannibalization**; it reflects an increase in the cash flows of the firm's other products that occurs because of a new project. [See also **Cannibalization**] For example, adding a delicatessen to a grocery store may increase cash flows more than the deli sales alone if new deli customers also purchase grocery items.

47. Enterprise Value

The value of a firm equal to the market capitalization (market value of the equity) plus the market value of outstanding debt.

48. Equilibrium Model

A model for the behavior of interest rates derived from a model of the economy.

49. Equilibrium Rate of Interest

The interest rate that clears the market.

50. Equipment Obligation Bonds

[See **Collateral**]

51. Equipment Trust Certificate

An equipment trust certificate gives the bondholder a claim to specific "rolling stock" (moveable assets), such as railroad cars or airplanes. The serial number of the specific items of rolling stock are listed in the bond indenture and the collateral is periodically examined by the trustee to ensure its proper maintenance and repair.

52. Equity

Ownership interest of common and preferred stockholders in a corporation. Also, total assets minus total liabilities; or net worth.

53. Equity Kicker

Used to refer to warrants because they usually are issued in combination with privately placed bonds.

54. Equity Method

One of the two methods that accounted for stock held as an investment in another corporation. The equity method is used if the investing firm exercises significant control over the other corporation (investee). Under this method the investment is recorded at cost. Any net earnings of the investee are recorded in proportion to the investor's share of ownership as an increase in the investment account of the investor. Dividends or net losses of the investee result in a decrease in the investing firm's investment account.

55. Equity Multiplier

Calculated as assets divided by total equity; the equity multiplier is determined by the firm's financing policy. A firm that uses a larger amount of financial leverage can support a faster sustainable growth rate, when all else remains constant. If actual growth exceeds the sustainable growth rate, a firm can finance the difference by taking on additional debt. Growth below the planned rate may lead to smaller additions to debt and an unplanned reduction in financial leverage. [See also **Capital structure ratios**]

56. Equity Swap

A swap where the return on an equity portfolio is exchanged for either a fixed or a floating rate of interest.

57. Equity-Linked Forward

A forward contract (e.g., for currency) where the quantity to be bought or sold depends upon the performance of a stock or stock index.

58. Equivalent Annual NPV (EANPV)

The net present value of a project divided by an annuity factor that has the same life as the investment.

We will give an example to demonstrate how different lives in capital budgeting needs an annuity factor to deal with this issue. In addition, we will mathematically derive the annuity factor. The traditional NPV technique is suitable for investment projects that have the same life. However it may not be appropriate to select a project from mutually exclusive investment projects, if these projects have different lives. The underlying reason is that, compared with a long-life project, a short-life project can be replicated more quickly

in the long run. In order to compare projects with different lives, we can compute the NPV of an infinite replication of the investment project. For example, let Projects A and B be two mutually exclusive investment projects with the following cash flows.

Year	Project A	Project B
0	−100	−100
1	70	50
2	70	50
3		50

By assuming a discount rate of 12 percent, the traditional NPV of Project A is 18.30, and the NPV of Project B is 20.09. This shows that Project B is a better choice than Project A. However, the NPV with infinite replications for Project A and B should be adjusted into a comparable basis.

In order to compare Projects A and B, we compute the NPV of an infinite stream of constant scale replications. Let NPV (N, ∞) be the NPV of an N-year project with NPV (N), replicated forever. This is exactly the same as an annuity paid at the beginning of the first period and at the end of every N years from that time on. The NPV of the annuity is:

$$NPV(N, \textit{infinity}) = NPV(N) + \frac{NPV(N)}{(1+K)^N} + \frac{NPV(N)}{(1+K)^{2N}} + \ldots. \quad \text{(A)}$$

In order to obtain a closed-form formula, let $(1/[(1+K)^N]) = H$. Then we have

$$\text{NPV}(N,t) = NPV(N)(1 + H + H^2 + \ldots + H^t). \quad \text{(B)}$$

Multiplying both sides by H, this becomes

$$H[NPV(N,t)] = NPV(N)(H + H^2 + \ldots + H^t + H^{t+1}). \quad \text{(C)}$$

Subtracting Equation (C) from Equation (B) gives

$$NPV(N,t) - (H)NPV(N,t) = NPV(N)(1 - H^{t+1}),$$

$$NPV(N,t) = \frac{NPV(N)(1 - H^{t+1})}{1 - H}.$$

Taking the limit as the number of replications, t, approaches infinity, we obtain:

$$\lim_{t\to\infty} NPV(N,t) = NPV(N,\infty) = NPV\left[\frac{1}{1-[1/(1+K)^N]}\right] = NPV(N)\left[\frac{(1+K)^N}{(1+K)^N - 1}\right]. \quad \text{(D)}$$

Equation (D) is the NPV of an N-year project replicated at constant scale an infinite number of times. We can use it to compare projects with different lives because when their cash-flow streams are replicated forever, it is as if they had the same (infinite) life.

For Project A:

$$NPV(2,\infty) = NPV(2)\left[\frac{(1+0.12)^2}{(1+0.12)^2 - 1}\right] = (18.30)\left[\frac{1.2544}{0.2544}\right] = 90.23.$$

For Project B:

$$NPV(3,\infty) = NPV(3)\left[\frac{(1+0.12)^3}{(1+0.12)^3 - 1}\right] = 20.09\left[\frac{1.4049}{0.4049}\right] = 69.71.$$

Consequently, we would choose to accept Project A over Project B, because, when the cash flows are adjusted for different lives, A provides the greater cash flow.

Alternatively, Equation (D) can be rewritten as an annuity version as:

$$K \times NPV(N,\infty) = \frac{NPV(N)}{Annuity\ factor}, \qquad \text{(E)}$$

where the annuity factor is

$$[1 - 1/(1 + K)^N]/K.$$

The decision rule from Equation (E) is equivalent to the decision rule of Equation (D). The left hand side of equation (E) is defined as equivalent annual NPV, which is called the equivalent annual NPV method in capital budgeting decision.

59. Equivalent Loan

The amount of the loan that makes leasing equivalent to buying with debt financing in terms of debt capacity reduction. This concept can be used to determine whether a firm should buy or lease equipments.

60. Equivalent Taxable Yield

The pretax yield on a taxable bond (t) providing an after-tax yield equal to the rate on a tax-exempt municipal bond (r_m).

$$r(1 - t) = r_m$$

$$r = r_m/(1 - t),$$

where t = marginal tax rate.

Thus the equivalent taxable yield (r) is simply the tax-free rate (r_m) divided by $1 - t$.

61. ERISA

Employee Retirement Income Security Act of 1974. This is a federal law that governs the administration of pension plans for nongovernmental employees. The basic provision is that all private corporations fully fund their pension plans.

62. Erosion

Cash-flow amount transferred to a new project from customers and sales of other products of the firm.

63. Estimation Risk

The risk of error in estimating a project's cash flows or required rate of return is called forecasting risk or estimation risk. The following table reviews some source of estimation risk associated with cash flows and required rate return.

Expected Cash Flows	Required Rates of Return
Political risk:	Real risk-free return:
Blocked currencies	Supply/demand for funds
Tariffs, quotas, embargoes	Macroeconomic consumption patterns
Military conflict	Investor optimism/pessimism
Unstable government	Long-run real economic growth
Fluctuating exchange rates	
Central bank policy	Expected inflation:
	Monetary policy
Fiscal policy:	Commodity prices
Government spending	
Tax policy	Risk premium:
	Systematic risk
Inadequate or incorrect:	Political risk
Strategic analysis	Exchange rate risk
Market research	Business risk
Pricing policy	Financial risk
Competitor retaliation	
Construction delays	
Delay in R&D, manufacturing, or production	
Work stoppages or strikes	
Technology obsolescence	

64. Euro

The European currency unit introduced in January 1999.

65. Eurobanks

Banks that make loans and accept deposits in foreign currencies.

66. Eurobonds

Eurobonds are bonds denominated in US dollars issued by firms in financial markets outside the US and typically pay interest annually. Eurobonds are an international bond sold primarily in countries other than the country in whose currency the issue is denominated.

67. Eurocurrency

A currency that is outside the formal control of the issuing country's monetary authorities.

68. Eurodollar Bonds

Eurodollar bonds are dollar-denominated bonds that are underwritten by international syndicates of commercial and investment banks. Because these issues are sold outside the US, they escape review by the SEC, somewhat reducing their issue expenses. Eurodollar bonds usually have fixed coupons with annual coupon payments. Most mature in three to ten years, so they are not attractive for firms that want to issue long-term debt. They typically are unsecured, pledging no specific assets to the bondholders in case of default. This is not a major concern to investors, as only the largest and financially strongest firms have access of the Eurobond market. Investors do care that the bonds are sold in bearer form, thus helping bondholders to remain anonymous and evade taxes on coupon income. Some researchers believe that this is the main reason that Eurodollar bond interest rates are low relative to US rates.

69. Eurodollar CD

Deposit of dollars with foreign banks.

70. Eurodollar Futures Contract

A futures contract written on a Eurodollar deposit.

71. Eurodollar Interest Rate

The interest rate on a Eurodollar deposit.

72. Eurodollars

Dollar-denominated deposits at banks of located outside the US. Eurodollar transaction denotes any transaction involving dollars that takes place outside the US.

73. Euroequity

Firms are not limited to domestic financial markets for raising capital. The world's financial markets have become more liquid and more integrated as cross-border restrictions have diminished, and more and more large corporations have begun looking outside their national boundaries to raise financing. US firms can raise money in the Euroequity market by selling equity and debt claims to non-US investors. Changes in tax laws and regulations, as well as lower financing costs, have led US firms to issue more offerings to non-US investors.

A cost advantage of trading in the Euroequity market is that Euroequity is traded over-the-counter in a large, active, cross-border market, so issuing firms need not register their securities on exchanges in many different countries.

74. European Currency Unit (ECU)

An index of foreign exchange which was introduced in eleven European countries in January 2002.

75. European Monetary Unit (EMC)

It is a form of denomination. It is consisted of the currencies of six original European Currency Unit (ECU) members.

76. European Option

A European option is an option that can be exercised only on the expiration date, which makes it simpler to analyze as compared to an **American option** because its term to maturity is known. An American option may be exercised any time up to the expiration date. [See also **American option**] The factors that determine the values of American and European options are the same; all other things being equal, however, an American option is worth more than a European option because of the extra flexibility it grants the option holder.

77. European, Australian, Far East (EAFE) Index

A widely used index of non-US stocks computed by Morgan Stanley.

78. Event Study

Research methodology designed to measure the impact of an event of interest on stock returns.

79. Excess Return

Rate of return in excess of the risk-free rate.

80. Exchange Option

An option permitting the holder to obtain one asset by giving up another. For example, an exchange call maturing t period from today provides the right to obtain one unit of the Nikkei index in exchange for one unit of the S&P index. In addition, standard calls and puts are exchange options in which one of the two assets is cash.

81. Exchange Rate

An exchange rate is the price of one currency in terms of another currency. [See also **Direct quote** and **Indirect quotes**]

82. Exchange Rate Risk

Investors in nondomestic securities face a number of risks beyond those of domestic securities. Exchange rate changes will cause fluctuations in the values of cash flows in terms of US dollars; this is called exchange rate risk.

83. Exchange Ratio for Business Combination

In business combination, two companies agree to exchange shares of common stock. In such a case, the determination of a "price" is actually the determination of an exchange ratio. Larson and Gonedes (1969) have presented a model for exchange ratio determination that involves making assumptions about the precombination and postcombination earnings streams and P/E (price/earnings) ratios.

For example, assume Firm A and Firm B are the acquired firm and the acquiring firm, respectively. Let the exchange ratio (ER) be defined as the number of traded shares of Firm B to be exchanged for the one traded share of Firm A. LG defined the postcombination price (p^*) as

$$p^* = \left[\frac{NI_A + NI_B}{N_B + (ER)(N_A)}\right](PE^*),$$

where NI_A = net income for Firm A, NI_B = net income for Firm B, N_A = number of shares outstanding for Firm A, N_B = number of shares outstanding for Firm B, PE^* = post combination price/earnings ratio.

By comparing p^* with price per share before the combination of Firm A (P_A) and Firm B (P_B), we find the following exchange ratio will affect the shareholders of both Firm A and Firm B as:

(i) The shareholders of Firm A are as well off after the combination as before if

$$ER \geq \frac{N_B P_B}{(NI_A + NI_B)(PE^*) - N_A P_A};$$

(ii) The shareholders of Firm B are as well off after the combination as before if

$$ER \leq \frac{(PE^*)(NI_A + NI_B)}{(N_A)(P_B)} - \frac{N_B}{N_A}.$$

84. Exchanges

National or regional auction markets providing a facility for members to trade securities. A seat is a membership on an exchange. For example, New York exchange and Philadelphia exchanges are national and regional exchange respectively.

85. Exclusionary Self-tender

The firm makes a tender offer for a given amount of its own stock while excluding targeted stockholders. It is the opposite of a targeted repurchase.

86. Ex-Dividend Date

A practical problem arises if a shareholder decides to sell a day to two before the record date. Because the brokerage industry requires some time to process the transaction and enter the name of the buyer on the stockholder list, it has arbitrarily decided that the right to the declared dividend is terminated four business days before the record date. Any sale between this ex-dividend date and the record date leaves the seller with the right to the dividend. The term ex-dividend comes from the Latin *ex* meaning *from*, because the dividend has been taken from anyone who buys the stock after the ex-dividend date.

The extent of the appropriate drop in stock prices associated with dividend payments depends in part on the tax situation of the marginal investor, the individual who at the margin causes an imbalance between supply and demand and therefore causes a price change. If the marginal investor in the marketplace is in the 30 percent tax bracket and the dividend is \$1.00 per share, the per-share price of the stock might fall by \$0.70 on the ex-dividend date, all else being equal. The price might not fall by a full dollar because the marginal investor realizes only a \$0.70 after-tax dividend.

One model has been developed to incorporate tax effects into determining the ex-dividend price as:

$$\frac{P_o - P_x}{D_o} = \frac{1 - T_p}{1 - T_g},$$

where P_o = the price just before the stock goes ex; P_x = the ex-dividend share price; D_o = the amount of the dividend per share; T_p = the relevant marginal personal tax rate; T_g = the effective marginal tax rate on capital gains.

If $T_p = T_g = 0$, or $T_p = T_g$, then $P_x = P_o - D_o$.

Tax laws require the corporation to mail a copy of Form 1099 to every shareholder at the end of the year to report the amount of dividends the firm paid to that person. The firm also sends a copy of this form to the IRS to report the dividend income it paid to each shareholder during the year. This system of informing the taxing authorities is unique to the US. Most other nations of the world require that corporations withhold portions of stockholders' dividends and turn these funds over to the government to settle each individual's tax liability on dividend income.

In sum, ex-dividend date is a date four business days before the date of record for a security. An individual purchasing stock before its ex-dividend date will receive the current dividend.

87. Ex-dividend or Ex-rights

Phrases used to indicate that a stock is selling without a recently declared right or dividend. The ex-rights or ex-dividend date is generally four business days before the date of record.

88. Executive Stock Options

Executive stock options provide stock purchase rights as compensation for corporate employees. For services rendered, the manager or the employee has the right to buy a specific number of shares for a set price during a given period. Unlike warrants and publicly traded options, executive stock options cannot be traded. The option's owner has only two choices: exercise the option or let it expire. Like a warrant, should the owner decide to exercise the option, the corporation receives money and issues new shares.

The use of executive stock options for management compensation raises an interesting agency question. The firm's managers may make investment and financing decisions that increase the firm's risk in order to increase the value of their stock options. Such an action could have a detrimental effect on the bondholders and other creditors of the firm.

89. Executor

An individual or trust department responsible for handling a settlement.

90. Exercise

The exchange of the strike price (or strike asset) for the underlying asset at the terms specified in the option contract.

91. Exercise Price

Price at which the holder of an option can buy (in the case of a call option) or sell (in the case if a put option) the underlying stock. Also called the striking price.

92. Exercise Style

The circumstances under which an option holder has the right to exercise an option. ''European'' and ''American'' are exercise styles.

93. Exercising the Option

The act of buying or selling the underlying asset via the option contract.

94. Exotic Option

A derivatives contract in which an ordinary derivative has been altered to change the characteristics of the derivative in a meaningful way. Also called a *nonstandard option*. Most exotic options trade in the over-the-counter market and designed by financial institutions to meet the requirement of their clients. For example, barrier options are exotic options. [See also **Barrier option**]

95. Expectations Hypothesis

The expectations hypothesis assumes that bond investors look ahead and make predictions, or form expectations, about future interest rates. From this perspective, in an efficient market, the return from investing in an N-year bond will be the same as the expected return from rolling over the proceeds (coupons and principal) from maturing one-year bonds into new one-year bonds over the N-year time frame. Thus today's long-term rates reflect expectations about future short-term rates

Although intuitive, the expectations hypothesis does not totally explain the shapes of observed term structures. Historically, the term structure is sloped upward; long-term rates usually are higher than short-term rates. Under the expectations hypothesis the typical upward-sloping term structure implies that the market always expects rising short-term interest rates. This does not agree with the observed behavior of short-term rates over time. Other explanations for the behavior of the term structure have attempted to correct this flaw.

96. Expected Return

Risk arises from the possibility that actual returns may differ from expected returns. Actual returns differ from expected returns whenever there is an unexpected change in an asset's price or cash flow

stream. Issuers must compensate investors with an expected return that is greater than the nominal risk-free return; otherwise, investors would have no economic incentive to place their capital at risk. A basic principle of finance is that higher risk leads to higher expected returns, or that *risk drives returns*.

A more complete model of returns is

$$\begin{aligned} \textit{Expected return} = {} & (1 + \textit{Real risk-free rate}) \\ & \times (1 + \textit{Expected inflation rate}) \\ & \times (1 + \textit{Risk premium}) - 1. \end{aligned}$$

Combining with our nominal risk-free rate gives us

$$\begin{aligned} \textit{Expected return} = {} & (1 + \textit{Nominal risk-free rate}) \\ & \times (1 + \textit{Risk premium}) - 1. \end{aligned}$$

The term *expected return* on the left-hand side of the equations indicates that the investor may not earn the stated return on an instrument. Because of risk, the actual return may be higher or lower than expected.

97. Expected Return-Beta Relationship

One implication of the capital asset pricing model (CAPM) is that security risk premiums (expected excess returns) will be proportional to beta. This is used to describe relationship between return and systematic risk, as shown in the security market line (SML).

98. Expected Value of a Variable

The average value of the variable obtained by weighting the alternative values by their probabilities.

99. Expiration Date

The time by which the option transaction must be carried out. In other words, it is the maturity date of an option.

100. Expiration-Date Risk

Futures contracts are not usually available for every month. If a hedger needed a futures contract for July and the only contracts that were available were for March, June, September, and December, the hedger would have to select either the June or September contract. Either of these contract would have a different price series than a July contract (if one existed). Hence, the hedger cannot form a perfect hedge and is faced with the chance that the basis may change.

101. Explicit Finite Difference Method

A method for valuing a derivative by solving the underlying differential equation. The value of the derivative at time t is related to three values at time $t + \delta t$. It is essentially the same as the trinomial tree method.

102. Exposure

The amount which would be lost in a default given the worst possible assumptions about recovery in the liquidation or bankruptcy of an obligor. For a loan or used facility it is the full amount of the facility, since the worst assumption is that the borrower draws the full amount and then goes bankrupt. In a credit risk analysis, it is called exposure at default (EAD)

103. Extendable Notes

Notes that have their coupons reset every two or three years to reflect the current interest rate environment and any changes in the firm's credit quality. At each reset, the investor may accept the new coupon rate (and thus effectively extend the maturity of the investment) or put the bonds back to the firm.

104. Extendable Swap

In an extendable swap, one party has the option to extend the life of the swap beyond the specified period.

105. Extension

Voluntary arrangements to restructure a firm's debt, under which the payment date is postponed.

106. Extension Risk

The risk that the holder of a mortgage-backed security will receive outstanding principal payment later than originally anticipated. Later principal payments result from interest rates rising and prepayments occurring slower than expected.

107. Extinguish

Retire or pay off debt.