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1. Macaulay Duration

The percent change in a bond's price for a given percent change in one plus the bond's yield. This calculation can be interpreted as the weighted average life of the bond, with the weights being the percentage of the bond's value due to each payment. A key assumption to this duration is that the yield curve is flat and that when rate changes, the yield curve shifts in a parallel fashion. [See also **Duration** and **Modified duration**]

2. Macroforecasting

Forecasts of price movements of the general stock market as a whole.

3. Macrohedge

A hedge strategy designed to reduce risk associated with a bank's entire balance sheet position. In other words, a financial institution manager wishes to use futures or other derivative securities to hedge the entire balance sheet duration gap.

4. Mail Float

Refers to the part of the collection and disbursement process where checks are trapped in the postal system [See also **Float**]

5. Maintenance Margin

Due to the difficulty of calling all customers whose margin accounts have fallen in value for the day, a clearing member firm usually will require that a sum of money be deposited at the initiation of any futures position. This additional sum is called a maintenance margin. In most situations, the original margin requirement may be established with

a risk-free, interest-bearing security such as a T-bill. However, the maintenance margin, which must be in cash, is adjusted for daily changes in the contract value. [See also **M arking to market**]

6. Make a Market

The obligation of a specialist to offer to buy and sell shares of assigned stocks. It is assumed that this makes the market liquid because the specialist assumes the role of a buyer for investors if they wish to sell and a seller if they wish to buy.

7. Make-Whole Clause

A provision which requires that the borrower make a payment to a lender after a loan is called or prepaid. The amount of the payment equals the net present value of the lost interest and principal payments.

8. Making Delivery

Refers to the seller's actually turning over to the buyer the asset agreed upon in a forward contract.

9. Management Risk

The variability of return caused by bad management decisions; this is usually a part of the unsystematic risk of a stock. Although it can affect the amount of systematic risk.

10. MAPB System

The moving-average with a percentage price band system (MAPB system) belongs to a technical family derived from moving averages. Moving averages come in many forms-that is, simple moving averages, exponentially weighted, linearly weighted, and so on. The MAPB system employs a simple moving average with a band based on a percentage of price centered around it. A signal to initiate a position occurs whenever the closing price breaks outside the band. A signal to exit a

position occurs when the price recrosses the moving average. The band creates a neutral zone in which the trader is neither long nor short. [See also **DMAC**]

11. Margin

A cash amount of funds that must be deposited with the broker for each futures contract as a guarantee of its fulfillment.

12. Margin Call

A demand for additional cash funds for each futures position held because of an adverse price movement.

13. Margin Requirement

Whenever someone enters into a contract position in the futures market, a security deposit, commonly called a margin requirement, must be paid. While the futures margin may seem to be a partial payment for the security on which the futures contract is based, it only represents security to cover any losses that may result from adverse price movements.

The minimum margin requirements set by the exchange must be collected by the clearing member firms (members of the exchange involved in the clearinghouse operations) when their customers take positions in the market. In turn, the clearing member firms must deposit a fixed portion of these margins with the clearinghouse. [See also **Marking to market**]

14. Marginal Cost of Funds

The incremental cost of additional funds to finance firm operations. Banks generally use federal funds or negotiable CD rates as marginal cost of funds.

15. Marginal Standard Deviation

Impact of a given asset on the total portfolio standard deviation.

16. Marginal Statistic

A statistic for a particular asset which is the difference between that statistic for the entire portfolio and that for the portfolio not including the asset.

17. Marginal Tax Rate

The marginal tax rate represents the proportion of each additional dollar of income that the government claims as taxes. The firm's marginal tax rate is important in financial decision making. Financial decisions hinge not on the **average tax rate** the firm has paid, but on the tax rate that applies to the additional income to be generated by a project. [See also **Average tax rate**]

One of the marginal costs that businesses must consider is the marginal tax that is paid should expansions or new projects be undertaken.

18. Marked to Market

Describes the daily settlement of obligation on futures positions. [See also **Marking to market**]

19. Market Anomalies

The idea of an efficient market is very important to the study of security analysis and portfolio management. If information is fully reflected in security prices, the market is efficient and it is not worthwhile to pay for information that is already impounded in security prices. The evidence seems to indicate that markets are efficient with respect to most types of information. However, there appears to be certain types of information associated with irregularities in the financial markets. Such irregularities are called market anomalies. Three of the most heavily researched anomalies are the **PE** effect, the size effect and the January effect.

20. Market Capitalization

Price per share of stock multiplied by the number of shares outstanding. It is total market value of equity.

21. Market Capitalization Rate

The market-consensus estimate of the appropriate discount rate for a firm's cash flows.

22. Market Clearing

Total demand for loans by borrowers equals total supply of loans from lender. The market clears at the equilibrium rate of interest.

23. Market Conversion Price

[See also **Convertible bond**.]

24. Market Corner

Owning a large percentage of the available supply of an asset or commodity that is required for delivery under the terms of a derivatives contract.

25. Market Exposure

For market-driven instruments, there is an amount at risk to default only when the contract is in-the-money (i.e., when the replacement cost of the contract exceeds the original value). This exposure/uncertainty is captured by calculating the netted mean and standard deviation of exposure(s).

26. Market Interest Rate, Bond

[See also **Yield to maturity**]

27. Market Model

A one-factor model for returns where the index that is used for the factor is an index of the returns on the whole market. It can be defined as:

$$R_{it} = \alpha_i + \beta_i R_{mt} + e_{it},$$

where R_{it} and R_{mt} are rate of return of i th security and market rate of return in period t , respectively.

[See also **Beta coefficient and Scatter diagram**]

28. Market or Systematic Risk, Firm-Specific Risk

Market risk is risk attributable to common macro-economic factors. Firm-specific risk reflects risk peculiar to an individual firm that is independent of market risk.

29. Market Order

A buy or sell order to be executed immediately at current market prices.

30. Market Portfolio

The market portfolio is comprised of all risky assets weighted in proportion to their market value. As such, the market portfolio is a completely diversified portfolio; it has no unsystematic risk. The returns on this portfolio will show only the effects of market wide or systematic risk. Investors who desire complete diversification and who want to eliminate unsystematic risk will want to hold the market portfolio.

Increase and decreases in an asset's value over time will reflect its exposure to both systematic and unsystematic risk factors. One way to measure the systematic risk of an asset or portfolio is to compare its returns over time with those of the market portfolio. Changes in the value of an asset relative to that of the market portfolio will reflect the asset's exposure to systematic risk factors.

31. Market Price

The current amount at which a security is trading in a market. For example, IBM price per share is \$95. This is a market price.

32. Market Price of Risk

A measure of the extra return, or risk premium, that investors demand to bear risk. The reward-to-risk ratio of the market portfolio. [See also **Sharpe ratio**]

33. Market Risk

Systematic risk. This term emphasizes the fact that systematic risk influences to some extent all assets in the market. [See also **Systematic risk**]

34. Market Segmentation Hypothesis

The market segmentation hypothesis explains the same phenomenon in terms of differences in supply and demand between segments of the capital markets. Some participants, such as banks, mainly borrow and lend short maturity securities. Others, such as pension funds, are major participants in the long-term portion of the yield curve. If more funds are available to borrow relative to demand in the short-term market than in the long-term market, short-term interest rates will be lower and long-term rates will be higher than predicted by both the expectations and liquidity preference hypothesis. [See also **Expectations hypothesis** and **Liquidity preference hypothesis**]

The drawback to this perspective is that it does not explain very well the usual upward slope of the term structure, nor does it provide a good explanation for the levels of intermediate-term rates. In addition, the financial markets are not strictly segmented; many institutions issue and purchase both short-term and long-term securities.

35. Market Segmentation Theory

The theory that long-maturity and short-maturity bonds are traded in essentially distinct or segmented markets and that prices in one market do not affect those in the other. [See **Market segmentation hypothesis**]

36. Market Stabilization

During the aftermarket, the managing investment bank tries to prevent any significant declines in the price of the issuer's shares; hence, this function by investment banks is sometimes also called market stabilization.

Investment banks do not want to be known for bringing firms public at excessive offering prices, nor do they want to be known for handling IPOs of poor-quality issuers. To help show the market that the bank will stand behind its IPOs, it risks its own money to support the firm by repurchasing any and all shares offered to it at the offering price. This effectively places a floor under the firm's stock price.

The investment bank acts as a signal to market investors. When a highly reputable investment bank places its own capital at risk to underwrite securities, the investing public can have a greater degree of confidence regarding the quality of the issue. If an investment bank is willing to sell shares on a commission basis only, that is a signal of a low-quality, high-risk offering.

37. Market Timer

An investor who speculates on broad market moves rather than on specific securities.

38. Market Timing

Asset allocation in which the investment in the market is increased if one forecasts that the market will outperform T-bills.

39. Market Value

The price at which willing buyers and sellers trade a firm's assets. In general, the market value is different from book value.

40. Market Value Added

A measure to identify successful firms that is growing in popularity is market value added (MVA). MVA measures the value created by the firm's managers; it equals the market value of the firm's stocks and debts minus the amount of money investors paid to the firm (their book value) when these securities were first issued. That is, market value added (MVA) equals:

Market value of stock + Market value of debt
 – Book value of stock – Book value of debt.

41. Market Value Ratios

A firm's profitability, risk, quality of management, and many other factors are reflected in its stock and security prices. Hence, market value ratios indicate the market's assessment of the value of the firm's securities.

The price-earnings (PE) ratio is simply the market price of the firm's common stock divided by its annual earnings per share. Sometimes called the *earnings multiple*, the PE ratio shows how much investors are willing to pay for each dollar of the firm's earnings per share. Earnings per share comes from the income statement, so it is sensitive to the many factors that affect the construction of an income statement, from the choice of GAAP to management decisions regarding the use of debt to finance assets. The price-earnings ratio is stated as:

$$P/E = \frac{\text{Market price per share}}{\text{Earnings per share}}$$

Stock prices are determined from the actions of informed buyers and sellers in an impersonal market. Stock prices reflect much of the known information about a company and are fairly good indicators of a company's true value. Although earnings per share cannot reflect the value of patents or assets, the quality of the firm's management, or its risk, stock prices can and do reflect all of these factors. Comparing a firm's PE to that of the stock market as a whole, or with the firm's competitors, indicates the market's perception of the true value of the company.

While the PE ratio measures the market's valuation of the firm relative to the income statement value for per-share earnings, the price-to-book-value ratio measures the market's valuation relative to balance sheet equity. The book value of equity is simply the difference between the book values of assets and liabilities appearing on the balance sheet. The price-to-book-value ratio is

the market price per share divided by the book value of equity per share. A higher ratio suggests that investors are more optimistic about the market value of a firm's assets, its intangible assets, and the ability of its managers. The price-to-book-value ratio is stated as:

$$\text{Price-to-book-value ratio} = \frac{\text{Market price per share}}{\text{Book value per share}}$$

Market value indicators reflect the market's perception of the true worth of a firm's *future prospects*. As such, market perceptions of a firm's value are important to the financial analyst. However, the market may not be perfect; investors may become overly optimistic or pessimistic about a firm. The fact that a firm presently has a higher PE or price-to-book-value ratio than its competition does not automatically imply that the firm is better managed or really deserves its higher valuation. Some firms may have low market value ratios because they truly deserve them; other firms may suffer from extreme and undeserved pessimism on the part of the market. High market value ratios can be similarly deceptive. The analyst must determine whether a firm deserves its market value ratios or not.

42. Marketability

Refers to the ease and quickness of converting an asset to cash. Also called liquidity.

43. Marketability Risk

The variability of return caused by the commissions and price concessions associated with selling an illiquid asset. It is also called liquidity risk. Marketability is made up of two components: (1) the volume of securities that can be bought or sold in a short period of time without adversely affecting the price, and (2) the amount of time necessary to complete the sale of a given number of securities. Other things being equal, the less marketability a security, the lower its price or the higher its yield.

44. Marketable Securities

Some current assets might be called *near cash* or *cash equivalents*. These are marketable securities. They are marketable because they can be readily converted into cash at any time without disrupting the normal routine of business operations. This feature makes these securities almost as liquid as cash, so cash and marketable securities often are combined into a single line item in financial reports and working capital analysis.

45. Market-Based Beta Forecasts

Market-based beta forecasts are based upon market information alone. Historical betas of firms are used as a proxy for their futures betas. This implies that the unadjusted sample beta, $\hat{\beta}_t$, is equal to the population value of future beta:

$$\beta_{t+1} = \hat{\beta}_t.$$

Alternatively, there may be a systematic relationship between the estimated betas for the first period and those of the second period, as shown by Blume (1971):

$$\hat{\beta}_{i,t+1} = a_0 + a_1\hat{\beta}_{i,t},$$

in which $\hat{\beta}_{i,t+1}$ and $\hat{\beta}_{i,t}$ estimated beta for the i th firm in period $t + 1$ and t , respectively.

46. Market-Book Ratio

Market price of a share divided by book value per share. [See also **Tobin's Q**]

47. Market-Driven Instruments

Derivative instruments that are subject to counterparty default (e.g., swaps, forwards, options, etc.). The distinguishing feature of these types of credit exposures is that their amount is only the net replacement cost (the amount the position is in-the-money rather than a full notional amount).

48. Marketed Claims

Claims that can be bought and sold in financial markets, such as those of stockholders and bondholders.

49. Market-Maker

A trader in an asset, commodity, or derivative who simultaneously offers to buy at one price (the bid price) or to sell at a higher price (the offer price), thereby "making a market."

50. Market-to-Book (M/B) Ratio

Market price per share of common stock divided by book value per share. It can be used as approximated measure of Tobin Q. [See also **Market value ratios**]

51. Market-Value-Weighted Index

An index of a group of securities computed by calculating a weighted average of the returns of each security in the index, with weights proportional to outstanding market value. [See also **S&P**]

52. Marking to Market

At the end of each trading day, every futures-trading account is incremented or reduced by the corresponding increase or decrease in the value of all open interest positions. This daily adjustment procedure is applied to the margin deposit and is called marking to market. For example, if an investor is long on a yen futures contract and by the end of the day its market value has fallen \$1,000, he or she would be asked to add an additional \$1,000 to the margin account. Why? Because the investor is responsible for its initial value. For example, if a futures contract is executed at \$10,000 with an initial margin of \$1,000 and the value of the position goes down \$1,000, to \$9,000, the buyer would be required to put in an additional margin of \$1,000 because the investor is responsible for

paying \$10,000 for the contract. If the investor is unable to comply or refuses to do so, the clearing member firm that he or she trades through would automatically close out the position. On the other hand, if the contract's value was up \$1,000 for the day, the investor might immediately withdraw the profit if he or she so desired. The procedure of marking to market implies that all potential profits and losses are realized immediately.

53. Markov Process

A stochastic process where the behavior of the variable over a short period of time depends solely on the value of the variable at the beginning of the period, not on its past history. Alternatively it is a finite set of "states" and whose next progression is determinable solely by the current state. A transition matrix model is an example of a Markov process.

54. Markowitz Model

Markowitz (1952) shows how to create a frontier of investment portfolios such that each of them had the greatest possible expected return, given their level of risk.

55. Mark-to-Market

The daily adjustment of a futures trading account to reflect profits or losses due to daily changes in the value of the futures contract. [See also **Marking to market**]

56. Mark-to-Market Swap

Reduces default risk by allowing the fixed rate to be reset when fixed and floating rates diverge substantially after the beginning of the swap.

57. Martingale

A zero-drift stochastic process. [See also **Stochastic process**]

58. Maturity

The date at which the principal of a note, draft, or bond becomes due and payable.

59. Maturity Date

The date on which the last payment on a bond is due.

60. Maturity Gap

It is the difference between the weighted-average maturity of financial institution's asset and liability. The maturity model with a portfolio of assets and liabilities is

$$\text{Maturity Gap} = M_A - M_L,$$

where M_A and M_L represent the weighted average maturity of FI's asset and liability, respectively.

61. Maturity Premium

When the default risk on a class of securities is virtually zero, the risk premium represents a maturity premium that reflects uncertainty about inflation and changes in interest rates over a longer time horizon.

62. Maximum Likelihood Method

A method for choosing the values of parameters by maximizing the probability of a set of observations occurring.

63. MBS

Mortgage-backed security. [See also **Mortgage-backed security**]

64. Mean Reversion

The statistical tendency in a time series to gravitate back towards a long term historical level. This is on a much longer scale than another similar measure, called autocorrelation; and these two behaviors are

mathematically independent of one another. For example, the tendency of a market variable (such as an interest rate) to revert back to some long-run average level.

65. Mean-Variance Analysis

Evaluation of risky prospects based on the expected value and variance of possible outcomes. [See also **Capital market line**]

66. Mean-Variance Criterion

The selection of portfolios based on the means and variances of their returns. The choice of the higher expected return portfolio for a given level of variance or the lower variance portfolio for a given expected return.

67. Measure

Sometimes also called a probability measure; it defines the market price of risk.

68. Measurement Error

Errors in measuring an explanatory variable in a regression that leads to biases in estimated parameters.

69. Median

The median is defined as the outcome value that exceeds the outcome value for half the population and is exceeded by the other half. Whereas the expected rate of return is a weighted average of the outcomes, the weights being the probabilities, the median is based on the rank order of the outcomes and takes into account only the order of the outcome values.

70. Membership or Seat on an Exchange

A limited number of exchange positions that enable the holder to trade for the holder's own ac-

counts and charge clients for the execution of trades for their accounts.

71. Merger

Assuming there are originally two firms, Firm A and Firm B. In one possible business combination, only Firm B survives. This type of combination is known as a merger and Firm B is called the *acquiring firm* while Firm A is called the *acquired* or *target firm*. [See also **Acquisition**]

Many researchers in economics and finance have advanced theories to justify firms' pursuit of mergers. The most recent efforts by academicians in these fields have begun to integrate individual theoretical rationales.

Among the myriad reasons that have been proposed to explain merger activity, the more prominent ones are

1. Economies of scale
2. Market power and market share
3. Diversification
4. Tax and surplus funds motives
5. Undervalued assets
6. Agency problems.

72. Microeconomic Risk

The risk that is diversified away as assets are added to a portfolio is the firm-specific and industry-specific risk, or the "microeconomic" risk. A well-diversified portfolio can reduce the effects of firm-specific or industry-specific events – such as strikes, technological advances, and entry and exit of competitors – to almost zero.

73. Microhedge

A hedge strategy designed to reduce the risk associated with a specific transaction. In other words, a financial institution employs a futures or forward contract to hedge a particular asset or liability risk.

74. Migration

Credit quality migration describes the possibility that a firm or obligor with some credit rating today may move to (or “migrate”) to potentially any other credit rating or perhaps default by the risk horizon. [See also **Transition matrix**]

75. Migration Analysis

The technique of estimating the likelihood of credit quality migration. [See also **Transition matrix**]

76. Miller-Orr Model

The Miller-Orr model (Miller and Orr, 1966) for cash management improves on Baumol’s economic order quantity model (EOQ) methodology in significant ways. Miller and Orr start with the assumption that the firm has only two forms of assets: cash and marketable securities. The model allows for cash balance movement in both positive and negative directions and it can state the optimal cash balance as a range of values, rather than a single-point estimate. This makes the model especially useful for firms with unpredictable day-to-day cash inflows and outflows.

While the Miller-Orr model is an improvement over the **EOQ model**, it too makes some assumptions. [See also **Baumol’s economic order quantity model**]The most important is the assumption that cash flows are random, which in many cases is not completely valid. Under certain circumstances and at particular times of the year, consecutive periods’ cash flows may be dependent upon one another, the volatility of net cash flows may sharply increase, or cash balances may demonstrate a definite trend. The frequency and extent of these events will affect the Miller-Orr model’s effectiveness. Actual tests using daily cash flow for various firms indicate that the model minimizes cash holding costs as well as or better than the intuitive decisions of these firms’ financial managers. However, others studies have shown that simple rules

of thumb have performed just as well. Still, the Miller-Orr model is valuable because of the insight it offers concerning the forces that influence a firm’s optimal cash balance.

77. Minimum-Variance Frontier

Graph of the lowest possible portfolio variance that is attainable for a given portfolio expected return.

78. Minimum-Variance Portfolio

The portfolio of risky assets with lowest variance. [See also **Appendix E**]

79. Mission Statement

The firm must operate to achieve a purpose or goal; otherwise, decisions will be made carelessly, allowing better informed, more serious competitors to put the firm out of business. Although many firms may have mission statement espousing goals of quality, customer service, fair prices, and so on, such qualitative statements are really only a means to an end. The firm’s managers need a definite benchmark against which to evaluate the alternative means for attaining these goals.

80. Mixed Average

[See also **Geometric average**]

81. Mode

The mode is the most likely value of the distribution or the outcome with the highest probability.

82. Modern Portfolio Theory (MPT)

Principles underlying analysis and evaluation of rational portfolio choices based on risk-return trade-offs and efficient diversification. [See also **Markowitz model**]

83. Modified Accelerated Cost Recovery System (MACRS)

MACRS depreciates assets by an accelerated method. In essence, it uses the double declining balance method until it becomes advantageous to use straight-line depreciation over the asset's remaining life.

To ensure some uniformity, MACRS assigns assets to classes, see Table A.

Assets in the 27.5-year or 31.5-year classes must be depreciated using the straight-line method over the appropriate number of years. Additionally, with some exceptions, MACRS follows a half-year convention; the asset receives a half-year's worth of depreciation in the year it is acquired, regardless of when it is actually purchased. Thus, assets in the three-year class are actually depreciated over *four* years; the owner writes off a half-year of depreciation in the Year 1, a full year of depreciation in each of Years 2 and 3, and the remaining half-year of depreciation in Year 4.

Annual accelerated depreciation percentages are given in Table B. To determine an asset's annual depreciation expense, the cost of the asset is multiplied by the percentage for the appropriate asset class and the appropriate year.

For example, for an asset in the three-year class that originally cost \$50,000, the first year's depreciation is $\$50,000 \times 0.3333 = \$16,665$; the second year's depreciation is $\$50,000 \times 0.4445 = \$22,225$; the third year's depreciation is $\$50,000 \times 0.1482 = \$7,410$; and the final year's depreciation is $\$50,000 \times 0.0740 = \$3,700$.

Table A: Depreciation Classes

3-year class	Designated tools and equipment used in research
5-year class	Cars, trucks, and some office equipment, such as computers and copiers
7-year class	Other office equipment and industrial machinery
10-year class	Other long-lived equipment
27.5-year class	Residential real estate
31.5-year class	Commercial and industrial real estate

Table B: MACRS Percentages

Year of Ownership	Asset Class			
	3-Year	5-Year	7-Year	10-Year
1	33.33%	20.00%	14.29%	10.00%
2	44.45	32.00	24.49	18.00
3	14.82	19.20	17.49	14.40
4	7.40	11.52	12.49	11.52
5		11.52	8.93	9.22
6		5.76	8.93	7.37
7			8.93	6.55
8			4.45	6.55
9				6.55
10				6.55
11				3.29

84. Modified Duration

A modification to the standard duration measure so that it more accurately describes the relationship between proportional changes in a bond price and absolute changes in its yield. The modification takes account of the compounding frequency with which the yield is quoted. Modified duration (MD) is Macaulay's duration (D) divided by one plus the prevailing interest rate (R) on the underlying instrument, i.e.,

$$MD = \frac{D}{1 + R}$$

85. Modified Internal Rate of Return

Modified internal rate of return (MIRR) rankings of mutually exclusive projects with comparable sized initial investments will agree with the NPV rankings of those projects. Additionally, the MIRR calculation always gives a single solution.

MIRR is calculated by way of a three-step solution:

1. Using the minimum required rate of return as the discount rate, find the *present* value of all cash outflows (for a conventional project, this will be just the initial cost of the project). This step converts all of the cash outflows into a lump-sum present value at Time 0.

2. Using the required return as the reinvestment or compounding rate, compute the *future* value of each cash inflow as of the end of the project's life. Add the future values together; this sum is sometimes called the terminal value. This step converts all cash inflows into a lump-sum future value at Time N .
3. Find the discount rate that allows the present value of the cash outflows to grow equal to the terminal value; this discount rate is the modified internal rate of return.

The decision rule for MIRR is similar to that for IRR: A project is acceptable if its MIRR exceeds the project's minimum required return. A drawback to the MIRR is that it, like the IRR, is a relative measure of attractiveness; it does not indicate the dollar amount by which projects change shareholder wealth.

86. Modigliani and Miller (M&M) Proposition I

Without Taxes

M&M Proposition I (Modigliani and Miller (1958)) makes several assumptions. First, it assumes that the firm pays no taxes. Second, it assumes that investors can borrow and lend money at the same interest rate as corporations. Thus, the firm and its investors can buy and sell securities at zero cost. Third, M&M Proposition I holds the firm's current and future real investment decisions constant. In other words, it assumes that all investors have the same expectations about the firms' future earnings and risk and investors can classify the firm with other corporations of similar business risk. Related to this idea is the assumption that future financing decisions will not affect the firm's investments in assets.

Under these assumptions, the value of the firm is unaffected by its specific capital structure. Through the use of personal borrowing or lending, investors can adjust their exposure to a firm's leverage to reflect their personal preferences.

The guiding force behind M&M is *arbitrage*. Should one strategy result in a higher value, investors will execute that strategy until the resulting supply and demand forces bring the values into line. For example, suppose there are two firms with identical business risk but Firm L is levered and Firm U has no debt. If Firm L were to have a higher value than Firm U , investors could use **homemade leverage** by borrowing and purchasing shares of Firm U to obtain levered cash flows more cheaply than if they purchased the shares of levered Firm L outright. [See also **Homemade leverage**] Investors purchases of the cheaper shares of Firm U would cause their price to rise until the value of Firm U was equal to that of Firm L .

Capital structure does not affect firm value under M&M Proposition I, as individual investors can costlessly adjust the effects of the corporation's leverage to suit themselves. If investors expect the firm to generate an operating profit of $E(EBIT)$ in perpetuity, the value of the levered firm (V_L) or the unlevered firm (V_U) will be that of a perpetuity:

$$V_L = V_U = \frac{E(EBIT)}{WACC} = \frac{E(EBIT)}{k_u}, \quad (1)$$

where $WACC$ represents the investors' required return (and hence the firm's cost of capital) for firms with this class of business risk; k_u represents a cost of unlevered equity.

The process of homemade leverage also can work in reverse. If a firm increases its debt-to-equity ratio to a level considered too risky by an investor, the investor can reverse the capital structure to receive cash flows identical to those before the firm took on the extra debt.

Under M&M Proposition I's assumptions, the only factors that affect firm value are the firm's level of expected operating income and its business risk, which is measured by the variation in operating income. Firm value is not affected by changes in financing strategy, since whatever the firm does, investors can use homemade leverage (or unleverage) to change the cash flows they receive.

With Tax

When there is a tax, then equation (1) should be redefined as

$$V_L = V_U + (T)(D), \quad (2)$$

where V_L = market value of levered firm, V_U = market value of unlevered firm, T = marginal corporate tax rate, D = total debt, and $(T)(D)$ = tax shield value.

87. Modigliani and Miller (M&M) Proposition II*Without Taxes*

M&M Proposition II defines a firm's cost of equity capital (and shareholders' required rate of return) in a world of no taxes, not transaction costs, and constant real investment decisions. The cost of equity capital for an unlevered firm (k_u), or a firm with no debt in its capital structure, is simply its expected level of operating income ($EBIT$) divided by its assets (TA):

$$k_u = \frac{E(EBIT)}{TA} = \frac{E(EBIT)}{Equity}.$$

M&M show that the cost of equity for a levered firm (k_e) is:

$$k_e = k_u + (k_u - k_d) \left(\frac{D}{E} \right), \quad (1)$$

where k_d is the cost of debt; $(k_u - k_d)(D/E)$ is the financial risk premium; and D/E is the debt equity ratio. The equation says that the cost of levered equity equals the cost of unlevered equity plus a risk premium to compensate shareholders for financial risk.

With Tax

If there exists a tax, then equation (1) should be rewritten as:

$$k_e = k_u + (k_u - k_d) \left(\frac{D}{E} \right) (1 - T),$$

where T represents marginal corporate tax rate. [See also **Modigliani and Miller (M&M) proposition I** for variable definitions]

88. Moments (of a Statistical Distribution)

Statistical distributions show the frequency at which events might occur across a range of values. The most familiar distribution is a normal "bell shaped" curve. In general though, the shape of any distribution can be described by its (infinitely many) moments.

- a. The *first* moment is the *mean*, which indicates the central tendency.
- b. The *second* moment is the *variance*, which indicates the width.
- c. The *third* moment is the *skewness*, which indicates any asymmetric "leaning" whether left or right.
- d. The *fourth* moment is the *kurtosis*, which indicates the degree of central "peakedness" or, equivalently, the "fatness" of the outer tails.

89. Monetary Policy

Economists believe that money supply growth has broad implications for future economic growth and future levels of inflation. As a consequence, most financial managers are interested in money supply changes over time and the current status of monetary policy. This gives them information about interest rates and inflation rate trends.

Monetary policy involves the use of the **Federal Reserve Board's** powers to affect the money supply, interest rates, and aggregate economic activity. [See also **Federal Reserve Board**]

90. Money Market

In the money market, securities are issued or traded that mature, or come due, in one year or less. Examples of money market securities include US Treasury bills, corporate commercial paper, and negotiable certificates of deposit.

91. Money Market Account

An investment that is initially equal to \$1 and increases at the very short-term risk-free interest rate prevailing at that time.

92. Money Market Deposit Account

Small time deposit whose holder is limited to three written checks per month.

93. Money Market Mutual Fund

Mutual fund that accepts customer funds and purchase short-term marketable securities.

94. Money Market Securities

The classification of a financial instrument as a marketable security typically is based upon maturity and, to a lesser extent, liquidity. Investment instruments with maturities of one year or less that are traded to some extent in secondary markets are called money market securities.

95. Money Purchase Plan

A defined benefit contribution plan in which the participant contributes some part and the firm contributes at the same or a different rate. Also called an individual account plan.

96. Money Spread

[See also **Spread (options)**]

97. Money Supply

The federal government's designation of certain liquid assets as money; M1A equals currency outside banks plus demand deposits; M1B equals M1A plus other checkable deposits; M2 equals M1B plus overnight RPs, savings and small time deposits, and money market funds; M3 equals M2 plus large time deposits and term RPs; L equals M3 plus other

liquid assets (where RPs are repurchase agreements).

98. Monotonicity

[See also **Rank order**]

99. Monte Carlo Valuation (Simulation)

A procedure for pricing derivative claims by discounting expected payoffs, where the expected payoff is computed using simulated prices for the underlying asset.

100. Moody's Bond Rating

Aaa – bonds of highest quality

Aa – bonds of high quality

A – bonds whose security of principal and interest is considered adequate but may be impaired in the future

Baa – bonds of medium grade that are neither highly protected nor poorly secured

Ba – bonds of speculative quality whose future cannot be considered well assured

B – bonds that lack characteristics of a desirable investment

Caa – bonds in poor standing that may be defaulted

Ca – speculative bonds that are often in default

C – bonds with little probability of any investment value (lowest rating)

101. Mortality Tables

Tables of probability that individuals of various ages will die within a year; created and used by life insurance companies.

102. Mortgage

A contract whereby a borrower provides a lender with a lien on real property as security against a loan.

103. Mortgage Banking

The business of packaging mortgage loans for sale to investors and retaining the servicing rights to the mortgages.

104. Mortgage Bonds

Mortgage bonds pledge real property or specific assets as security. [See also **Collateralized Bonds**]

105. Mortgage Securities

A debt obligation secured by a mortgage on the real property of the borrower.

106. Mortgage Servicing

The process of collecting monthly payments on mortgages, keeping records, paying the associated insurance and taxes, and making monthly payments to holders of the underlying mortgages or mortgage-backed securities.

107. Mortgage-Backed Security

An ownership claim in a pool of mortgages or an obligation that is secured by such a pool. These claims represent securitization of mortgage loans. Mortgage lenders originate loans and then sell packages of these loans in the secondary market. Also called a *pass-through* because payments are passed along from the mortgage originator to the purchaser of the mortgage-backed security.

108. Move Persistence

The statistical tendency in a time series to move on the next step in the same direction as the previous step. [See also **Autocorrelation**]

109. Moving-Average

Moving-average (of rate-of-change) technicians focus on prices and/or moving averages of prices.

The moving average is used to provide a smoothed stable reference point against which the daily fluctuations can be gauged. When the daily prices penetrate above the moving-average line, technicians interpret this penetration as a bearish signal. When the daily prices move downward through the moving average, they frequently fail to rise again for many months.

Moving-average analysts recommend buying a stock when: (1) the 200-day moving average flattens out and the stock's price rises through the moving average, (2) the price of a stock falls below a moving-average line that is rising, and (3) the price of a stock that is above the moving-average line falls but turns around and begins to rise again before it ever reaches the moving-average line.

Moving-average chartists recommend selling a stock when: (1) the moving-average line flattens out and the stock's price drops downward through the moving-average line, (2) a stock's price rises above a moving-average line that is declining, and (3) a stock's price falls downward through the moving-average line and turns around to rise but then falls again before getting above the moving-average line.

110. Multibank Holding Company

A bank holding company that owns controlling interest in at least two commercial banks.

111. Multifactor CAPM

Generalization of the basic CAPM that accounts for extra-market hedging demands.

112. Multiple Rates of Return

More than one rate of return from the same project that make the net present value of the project equal to zero. This situation arises when the IRR method is used for a project in which negative cash flows follow positive ones.

113. Multiples

Another name for price-earnings ratios.

114. Municipal Bonds

Tax-exempt bonds issued by state and local governments, generally to finance capital improvement projects. General obligation bonds are backed by the general taxing power of the issuer. Revenue bonds are backed by the proceeds from the project or agency they are issued to finance.

115. Municipals

Securities issued by states, local governments, and their political subdivisions.

116. Mutual Fund

A pool of funds that is managed by an investment company. Investors in a mutual fund own shares in the fund, and the fund uses the proceeds to buy different assets. Some of the important mutual funds are money market funds, fixed-income funds, balance funds, income funds, asset allocation funds, index funds and growth funds.

117. Mutual Fund Theorem

A result associated with the CAPM, asserting that investors will choose to invest their entire risky portfolio in a market-index mutual fund.

118. Mutual Savings Bank

Firms without capital stock that accept deposits and make loans.

119. Mutually Exclusive Investment Decisions

Investment decisions in which the acceptance of a project precludes the acceptance of one or more alternative projects.

120. Mutually Exclusive Projects

Investment projects are mutually exclusive, or competing projects when they represent different alternatives to meet the same perceived need. Since all of the alternatives seek to meet the same need, the firm will choose only the one that creates the most value for shareholders.