

Chapter 1 - Investments: Background and Issues

- Investment vs. investments
- Real assets vs. financial assets
- Financial markets and the economy
- Investment process
- Competitive markets
- Players in investment markets
- Financial crisis of 2008
- Recent trends
- Investments as a profession

- Investment vs. investments

Investment: the commitment of current resources in the expectation of deriving greater resources in the future (you sacrifice current consumption in order to derive more wealth in the future)

For example:

You cut current consumption to purchase stocks and anticipate that stock prices will rise in the future

You forego current leisure and income to take the investments class and expect that a degree in finance from CSUN will enhance your future career

Investments

The detailed study of the investment process - focus of this class

- Real assets vs. financial assets

Real assets: assets used to produce goods and services

Financial assets: claims on real assets or income generated by real assets - focus

Financial assets

Fixed-income securities: paying a fixed stream of income over a specified period - CDs, bonds, T-bills, etc.

Equity securities: ownership in a corporation - stocks

Derivative securities: their payoffs depend on the values of other assets - futures, options, swaps, etc. (FIN 436 - Futures and Options for more details)

Balance sheet for U.S. households, 2011 (Table 1.1)

Real assets:	\$23,085 billion (32.1%)	Liabilities:	\$13,875 billion (19.3%)
<u>Financial assets:</u>	<u>\$48,847 billion (67.9%)</u>	<u>Net worth:</u>	<u>\$58,058 billion (80.7%)</u>
Total	\$71,932 billion (100%)	Total	\$71,932 billion (100%)

- Financial markets and the economy
 - Informational role of financial markets
 - Consumption timing
 - Allocation of risk
 - Separation of ownership and management: agency problem
 - Agency problem: potential conflicts between two groups of people
 - Agency problems exist between managers and shareholders
 - Agency problems exist between bondholders and shareholders
 - Corporate governance and corporate ethics
 - Accounting scandal - WorldCom overstated its profit by at least \$3.8 billion
 - Analyst scandal - systematically misleading and overly optimistic research reports in exchange for future business
 - IPO share allocation - to corporate executives in exchange for personal benefit or future business

- Investment process
 - (1) Investment policy: objective, risk-return trade-off
 - (2) Asset allocation: choice of broad asset classes
 - (3) Security selection: choice of particular securities to be held in the portfolio
 - (4) Security analysis: valuation of securities
 - (5) Portfolio construction, management and analysis: selection of the best portfolio (combination)
 - (6) Portfolio rebalancing: adjustment of the portfolio

- Competitive markets
 - Risk-return trade off: no free lunch rule indicates that assets with higher expected returns entail greater risk

 - Efficient markets: security prices should reflect all the information available in the market quickly and efficiently

 - Three forms of market efficiency
 - Weak-form efficiency - reflect past trading information (past prices, returns, and volumes)
 - Semi-strong form efficiency – reflect publicly available information
 - Strong-form efficiency – reflect all information, including public and private information

 - Passive vs. active portfolio management
 - Passive strategy - buying and holding a diversified portfolio
 - Active strategy - attempting to identify mispriced securities or to forecast market trends

- Players in investment markets

Government: federal, state, and local

Business: firms and corporations, including financial intermediaries

Individuals: individual investors, institutional investors

Financial intermediaries: institutions that connect borrowers and lenders such as banks, investment companies, insurance companies, and credit unions, etc.

Investment companies (mutual funds): firms managing funds for investors

Investment bankers: firms specializing in the sale of new securities to the public by underwriting the issue

Underwriting: a process by which an investment banker raises investment capital from investors on behalf of a corporation that is issuing securities

Role of an investment banker: advising, underwriting, and distributing

Primary markets vs. secondary markets

Primary markets are markets for new issues of securities

Secondary markets are markets for trading previously issued securities

Venture capital and private equity

Venture capital: money invested to finance a new firm (start-ups)

Private equity: investments in companies that are not traded on a stock exchange

Organizational life cycle

Birth

Growth

Maturity

Decline

Death

- Financial crisis of 2008
 - Antecedents of the crisis: after the collapse of the high-tech bubble in 2000-2002, the Fed aggressively reduced interest rates to boost the economy
 - Housing market boomed and housing prices kept rising

 - Changes in housing finance: securitization, nonconforming (subprime) loans, ARMs, interest only loans, etc.

 - Mortgage derivatives: investment securities developed by the financial industry to provide different risk and interest-rate profiles from pools of mortgages

 - Systematic risk: risk of breakdown in the financial system

 - The congress passes several laws and regulations to protect investors and to mitigate systematic risk

- Recent trends
 - Globalization: integration of global financial markets
 - Securitization: pooling loans into standardized securities
 - Financial engineering: creation of new securities by combining primitive and derivative securities into one composite hybrid (for example, combining stocks and options) or by separating returns on an asset into classes (for example, separating principal from interest payment in a fixed income security)
 - Computer network

- Investments as a profession
 - Investment bankers
 - Investment companies
 - Traders and brokers
 - Security analysts and/or CFA (Chartered Financial Analyst)
 - Portfolio managers
 - Financial planners
 - Financial managers

- ASSIGNMENTS
 1. Concept Checks and Summary
 2. Key Terms
 3. Intermediate: 9, 10 and 14

Chapter 2 - Asset Classes and Financial Instruments

- Money market and its securities
- Bond market and its securities
- Equity market and its securities
- Market indexes
- Derivative markets

- Money market and its securities

Money markets vs. capital markets

Money markets: short-term, highly liquid, and less-risky debt instruments

Capital markets: long-term debt and stocks

Securities in money markets:

T-bills: short-term government securities issued at a discount from face value and returning the face amount at maturity

T-bills are issued weekly with initial maturities of 4 weeks, 13 weeks, 26 weeks, and 52 weeks. The minimum denomination is \$100, even though \$10,000 denominations are more common. It is only subject to federal taxes and is tax exempt from state and local taxes.

Bid vs. asked price

Bid price is the price you will receive if you sell a T-bill to a dealer

Asked price is the price you pay to buy a T-bill from a dealer

Asked price > bid price, the difference is called bid-ask spread - profit for a dealer

T-bills are quoted in yields based on prices (Figure 2.1)

For example, a 245 day T-bill sells to yield 0.07% (asked) means that a dealer is willing to sell the T-bill at a discount of $0.07\% \times (245/360) = 0.04764\%$ from its face value of \$10,000, or at $\$9,995.236 = [10,000 \times (1 - 0.0004764)]$. If an investor buys this T-bill, the return over 245 days will be $(\$10,000/\$9,995.236) - 1 = 0.04764\%$. The annualized return will be $0.04764\% \times (365/245) = 0.07097\% = 0.071\%$ (asked yield). T-bills are quoted based on 360 days per year.

Similarly, a dealer is willing to buy the 245 day T-bill at a discount of 0.085% (bid) or at $\$9,994.215 = [10,000 \times (1 - 0.00085(245/360))]$ for a face value of \$10,000.

Bid-asked spread = $9,995.236 - 9994.215 = \$1.021/\text{T-bill}$ (profit for the dealer)

CDs: a bank time deposit

Commercial paper: a short-term unsecured debt issued by large corporations

Banker's acceptance: an order to a bank by a customer to pay a sum of money in a future date

Eurodollars: dollar denominated deposits at foreign banks or foreign branches of American banks

Repurchase agreements (Repos): short-term sales of government securities with an agreement to buy them back later at a higher price

Federal funds: funds in the accounts of commercial banks at the Federal Reserve Bank. To meet the Fed requirement (minimum balance depends on the total deposits of the banks' customers, reserve ratio) banks may borrow or lend money at the Federal funds rate.

LIBOR: London Interbank Offer Rate, which is the rate among big banks in the London market

Other short-term debts

- Bond market and its securities

T-notes and T-bonds: debt issued by the federal government with original maturity of more than one year. The minimum denomination is \$1,000.

T-notes: up to 10 years in maturity and pay semiannual interests

T-bonds: up to 30 years in maturity and pay semiannual interests

Coupon rate and coupon payments

Prices are quoted as a percentage of \$100 face value (more often traded in denominations of \$1,000 (Figure 2.3)

For example, a bond maturing on Nov. 15, 2015 and quoted at 113.0000 (asked price) means you pay a price of \$113.00 for a face value of \$100, or \$1,130 for a face value of \$1,000. The coupon rate is 4.5% per year and yield to maturity for the bond is 1.410%.

Inflation-protected T-bonds (TIPS): the principal amount is adjusted in proportion to increases in the Consumer Price Index to earn a constant stream of income in real dollars

Municipal bonds (munis): issued by state or local governments and tax-exempt from federal and state

Equivalent taxable yield: $r = r_m / (1 - t)$

After tax return: $r_m = r*(1 - t)$

Example: suppose your marginal tax rate is 28%. Would you prefer to earn a 6% taxable return or 4% tax-free return? What is the equivalent taxable return of the 4% tax-free return?

Answer: $6%*(1-28%) = 4.32%$ or $4% / (1-28%) = 5.56%$

You should prefer 6% taxable return because you get a higher return after tax, ignoring the risk

Federal agency debt: issued by government agencies, such as Freddie Mac, Fannie Mac, and Ginnie Mac

Corporate bonds: issued by corporations (rated from AAA, AA, A, BBB, BB, ...)

Callable bonds: give the issuing firm the right to buy back its bonds before bonds mature

Mortgages and mortgage-backed securities

Mortgage lenders originate different loans, including fixed or variable loans and then bundle them in packages and sell them in the secondary market.

Debentures: bonds with no collateral

International bonds

- Equity market and its securities

Common stock: ownership of a corporation

Characteristics: residual claim and limited liability

Stock market listing (Figure 2.8)

Stock Symbol (GE)

Close (Closing price is \$19.30)

Net Change (\$0.25, the change from the closing price on the previous day)

Volume (trading volume is 44,235,766 shares exchanging hands on the day)

52 week high and low (range of price, for GE, \$21.65 - \$13.96)

Dividend (\$0.60 is the annual dividend, or \$0.15 last quarter)

Dividend yield ($0.60/19.30 = 3.11%$)

P/E ratio (price per share to earnings per share ratio is 15.32)

Year-to-date (YTD) % change (GE's price has increased by 5.52% since the beginning of the year)

Preferred stock: hybrid security with both bond and common stock features

Cumulative and non-cumulative preferred stocks

Tax treatment for firms: 70% of preferred stock dividends received by a firm is tax-exempt (70% exclusion)

70% exclusion doesn't apply to individuals

- Market indexes

Averages vs. indexes

Averages: reflect general price behavior in the market using the arithmetic average of stock prices (price weighted)

Indexes: reflect general price behavior in the market relative to a base value (market value weighted)

Dow Jones Industrial Average (DJIA): a stock market average made up of 30 high-quality industrial stocks and believed to reflect the overall stock market

Current Dow Companies (Table 2.5)

$$\text{DJIA} = \frac{\text{Closing } P_1 + \text{Closing } P_2 + \dots + \text{Closing } P_{30}}{\text{DJIA divisor}}$$

The divisor must be adjusted for stock dividends and stock splits. In a similar way, if one firm is dropped from the average and another firm with a different stock price is added, the divisor has to be updated to leave the average unchanged.

S&P 500 index: a market value-weighted index made up of 500 big company stocks and is believed to reflect the overall market

$$\text{S\&P indexes} = \frac{\sum \text{Current closing market value of stocks}}{\sum \text{Based period closing market value of stocks}}$$

Market value (market cap) = market price * number of shares outstanding

Note: stocks in DJIA and S&P indexes can change

Index funds and exchange-traded funds (ETFs)

Other averages and indexes

Dow Jones transportation average (20 transportation stocks, price weighted)

Dow Jones utility average (15 utility stocks, price weighted)

Dow Jones composite average (65 stocks, including 30 industrial, 20 transportation, and 15 utility stocks, price weighted)

NYSE composite index: behavior of stocks listed on the NYSE (value weighted)

Nasdaq 100 index: OTC market stock behavior (value weighted)

Russell 2000 index: small stock behavior (value weighted)

Wilshire 5000 index (NYSE and OTC): overall stock market behavior (value weighted)

Foreign and international stock market indexes: Nikkei 225 (Japan), FTSE 100 (UK), DAX 30 (Germany), Hang Seng 48 (Hong Kong), and TSX 60 (Toronto)

Bond market indicators: Merrill Lynch, Barclays (formerly Lehman Brothers) and Salomon Smith Barney (now part of Citigroup)

Market indexes, example 1

You are given the following information regarding stocks X, Y, and Z:

Date	Stock price			# of shares outstanding		
	X*	Y	Z	X*	Y	Z
0	\$50	\$50	\$50	100	100	100
1	26	51	51	200	100	100
2	27	52	52	200	100	100

* Stock X has a 2-for-1 stock split before trading on day 1. Date 0 is the base date. The current divisor is 3.0 and the base value for an S&P type of index is supposed to be 10.

Q1. What would be the value of an S&P type index at the end of date 1?

$$\text{S\&P index} = \frac{26 \cdot 200 + 51 \cdot 100 + 51 \cdot 100}{50 \cdot 100 + 50 \cdot 100 + 50 \cdot 100} \times 10 = 10.27$$

$$\text{Rate of return on date 1} = (10.27/10) - 1 = 2.7\%$$

Q2. What would be the value of an S&P type index at the end of date 2?

$$\text{S\&P index} = \frac{27*200 + 52*100 + 52*100}{50*100 + 50*100 + 50*100} * 10 = 10.53$$

$$\text{Rate of return on two days} = (10.53/10) - 1 = 5.3\%$$

Q3. What would be the value of a DJIA type average at the end of date 2?

$$\text{At the end of date 0: DJIA type average} = (50 + 50 + 50) / 3 = 50$$

Before date 1: DJIA type average = $(25 + 50 + 50) / d = 50$, solve for $d = 2.5$
(Rational: A 2-for-1 stock split for stock X will split the price in half but it should not affect the average itself. Therefore, the divisor should be adjusted.)

$$\text{At the end of date 2: DJIA type average} = (27 + 52 + 52) / 2.5 = 52.4$$

$$\text{Rate of return on two days} = (52.4 / 50) - 1 = 4.8\%$$

Market indexes, example 2

Consider a price weighted market average composed of three securities, A, B, and C, with prices of 20, 30 and 40 respectively. The current divisor is 3.00. What will be the new divisor if stock B issues a 10% stock dividend?

$$\text{Answer: closing average before stock dividend} = (20 + 30 + 40) / 3.00 = 30.00$$

Adjust the price of stock B: $30 / (1 + 0.1) = 27.27$ (new stock price for B if B issues 10% stock dividend)

Calculate the new divisor: $(20 + 27.27 + 40) / d = 30.00$ (stock dividend should not affect the closing average) and solve for the new divisor, $d = 2.91$

- Derivative markets

Derivative assets or contingent claims: payoffs depend on the prices of other (underlying) assets

Options: the rights to buy or sell an asset at a specified price on or before a specified expiration date (rights)

A call option gives the right to buy an asset

A put option gives the right to sell an asset

Example1 - you buy an October 200 IBM call option at \$5.00
Call option: right to buy
Stock option: underlying asset is IBM stock (current stock price is \$191)
Contract size: 100 shares
Exercises price: \$200 to buy one share of IBM stock
Expiration date: the third Friday in October
Option premium: \$500
Rationale: you expect IBM stock price is going to rise - speculating

Example 2 - you buy an October 23 Intel put option for \$2.50
Put option: right to sell
Stock option: underlying asset is Intel stock (current stock price is \$22.80)
Contract size: 100 shares
Exercises price: \$23 to sell one share of Intel stock
Expiration date: the third Friday in October
Option premium: \$250
Rationale: you expect that Intel stock price is going to fall - speculating

Futures contracts: call for the exchange of certain goods for cash at an arranged-upon price (future's price) at a specified future date (obligations)

Example 3 - you buy an October gold futures contract at \$1,350 per ounce
Commodity futures contract: underlying asset is gold (commodity)
Contract size: 100 ounces
Futures price: \$1,350 per ounce to buy gold (current spot price is \$1,290 per ounce)
Delivery month: October
Rationale: you expect gold price is going to rise - speculating

Example 4 - a farmer sells an October corn futures contract at 525
Commodity futures contract: underlying asset is corn (commodity)
Contract size: 5,000 bushels
Futures price: \$5.25 per bushel to sell corn (current spot price is \$5.50 per bushel)
Delivery month: October
Rationale: the farmer wants to lock in the price - hedging

- ASSIGNMENTS

1. Concept Checks and Summary
2. Key Terms
3. Intermediate: 12, 13, 14, 18, 19,21, 22 and CFA1

Chapter 3 - Securities Markets

- New issues
- How securities are traded
- U.S. securities markets
- Trading costs
- Margin trading and short sales
- Regulations

- New issues
Recall primary markets and secondary markets

Primary markets: for new issues, either IPOs or existing firms issuing new securities (seasoned offerings)

IPOs: initial public offerings, shares being sold to the public for the first time

Investment banker: firm specializing in the sale of new securities

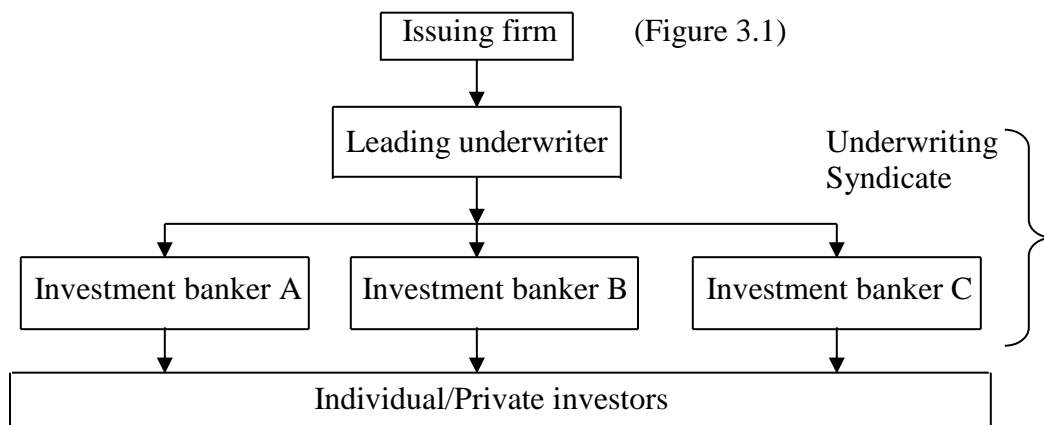
Underwriters: purchase new shares from the issuing firm and resell the shares to the public

Prospectus: a document that describes the firm issuing the security and provides the information about the firm

Selling process for large new issues: the role of investment bankers
Underwriting; Advising; Distributing

Best efforts vs. underwritten issues

Underwriting syndicate: a group of investment bankers formed by a leading underwriter to spread the financial risk associated with selling new securities



Private placement: new securities are sold directly to a small group of individuals or wealthy investors

Initial return of IPOs: very high first day returns all over the world - Figure 3.2

- How securities are traded

Types of markets

Direct search markets: buyers and sellers seek each other directly, which are the least organized markets, for example, a student buys a used car from another student

Brokered markets: brokers offer search services for profits/commissions, for example, the real estate market

Dealer markets: dealers specializing in particular assets buy and sell them in their own accounts for profits, for example, the over-the-counter (OTC) markets

Auction markets: traders converge at one place to buy and sell assets, for example, the New York Stock Exchange (NYSE). Auction markets are the most efficient markets because all traders will get the best price possible.

Types of brokers

Full service broker vs. discount broker

Types of accounts

Cash account vs. margin account (without or with borrowing capacity)

Bid price - the highest price a dealer is willing to pay for a given security

Asked price - the lowest price a dealer is willing to sell a given security

Bid-ask spread: the difference of the two prices, which is the profit for a dealer

Types of orders:

Market order: to buy or sell at the best price available

Limit order: to buy at or below a specified price or sell at or above a specified price

Stop order (stop-loss order): to sell when price reaches or drops below a specified level or to buy when price reaches or rises above a specified level. It becomes a market order when the stop price is reached.

Stop-limit order: a combination of a stop order and a limit order

Examples

Comparison of a limit order and a stop order (Figure 3.5)

	Price falls below the limit	Price rises above the limit
Buy	Limit-buy order	Stop-buy order
Sell	Stop-loss order	Limit-sell order

Trading mechanics

Dealer markets: trade through dealers, for example, in OTC markets

Electronic communication networks (ECNs): direct trade over computer network without market makers or dealers

Specialist markets: trade through specialists, for example, in NYSE

Specialist: a trader who makes a market in the shares of one or more stocks and maintains a fair and orderly market by dealing personally in the market

- U.S. securities markets

Nasdaq: National Association Security Dealers Automated Quotations System

Nasdaq stock market: a computer-linked price quotation system for the OTC markets with about 3,200 firms listed for trading

NYSE: New York Stock Exchange, the largest exchange in the U.S. with more than 3,000 firms listed for trading

Block trade: a large transaction in which at least 10,000 shares of stock are bought or sold

Program trade: a coordinated purchase or sale of an entire portfolio

Settlement: a trade must be settled in 3 working days, called T+3 settlement

- Trading costs

Full service brokers charge more than discount brokers

Fixed-commission schedule - small transactions, for example, \$9.95 for a trade up to 1,000 shares

Negotiated commissions - large transactions (block trade)

Explicit vs. implicit cost

Commissions are explicit costs while bid-ask spread is an implicit (hidden) cost

- Margin trading and short sales

Types of transactions:

Long purchase - direct buy

Short selling - sale of borrowed securities

Margins:

Margin trading - borrow money and buy stock to magnify returns by reducing the amount of capital that must be put in by investors

Margin requirements - the minimum amount of equity put in by an investor

Initial margin - the minimum amount of equity that must be provided by an investor at the time of purchase, 50% minimum

Maintenance margin - the minimum amount of equity that must be maintained in the margin account at all time, 25% minimum

Margin call - notification of the need to bring additional equity

(1) Buying on margin (borrow money and buy stock)

Rational: you believe the stock is currently underpriced in the market and expect the price will rise in the future.

$$\text{Margin} = \frac{\text{Market value of stock} - \text{Loan}}{\text{Market value of stock}} = \frac{\text{Equity in account}}{\text{Market value of stock}} \quad (1)$$

Buying on margin, example 1

Suppose you bought 100 shares of XYZ at \$50.00 per shares in your margin account. The initial margin is 50% and the maintenance margin is 25%.

a) At what price, will you receive a margin call?

b) If the price drops to \$40, what will happen to your account?

c) If the price drops to \$30, how much money should you provide to retain the minimum margin requirement?

a) $100 * 50 = \$5,000$ (total cost to purchase 100 shares)

Equity = \$2,500 (the amount you provide which is 50% of total cost)

Loan = \$2,500 (the amount you borrow which is 50% of total cost)

Let P be the price at which your maintenance margin drops to 25%, using (1),

$$\frac{100 * P - 2,500}{100 * P} = 0.25, \text{ solve for } P = \$33.33$$

If the price drops below \$33.33, you will receive a margin call.

b) If the price drops to \$40 > \$33.33, your account is restricted (losing money) but there is no margin call.

c) Let X be the amount of money you need to provide (to reduce the loan) to keep the maintenance margin, using (1)

$$\frac{100*30 - (2,500 - X)}{100*30} = 0.25, \text{ solve for } X = \$250$$

You need to add, at least, \$250 to reduce the loan amount to \$2,250 in order to keep the maintenance margin of 25%.

(2) Short sale on margin (you borrow shares from your broker and sell them now)

Rational: you believe the stock is currently overpriced in the market and expect the price will drop in the future.

Up-tick (a price that is higher than that of the previous trade)

Up-tick rule in short sale: a rule designed to restrict short selling from further driving down the price of a stock that has dropped more than 10% in one day. At that point, short selling would be permitted if the price of the security is above the current national best bid (uptick). It will enable long sellers to stand in the front of the line and sell their shares before any short sellers once the circuit breaker (a 10% drop in one day) is triggered.

$$\text{Margin} = \frac{\text{Value of assets} - \text{Loan}}{\text{Value of stock owed}} = \frac{\text{Equity}}{\text{Loan}} \quad (2)$$

Short sale on margin, example 2

Suppose you short sell 100 shares of ABC at \$100 per share in your margin account. The initial margin is 60% and the maintenance margin is 30%.

- a) At what price, will you receive a margin call?
- b) What will happen if the price rises to \$110 per share?
- c) If the price drops to \$80 per share after your short sale, what is the return from short sale if the interest charge totals \$500?

a) $100*100 = \$10,000$ (short sale proceeds)
 $10,000*60\% = \$6,000$ (the initial margin you should provide which is 60% of short sale proceeds)
 Value of assets = \$16,000

Let P be the price at which your margin drops to 30%, using (2),

$$\frac{16,000 - 100*P}{100*P} = 0.30, \text{ solve for } P = \$123.08$$

If the price rises above \$123.08 you will receive a margin call.

b) If the price rises to \$110 < \$123.08, your account is restricted (losing money) but you will not receive a margin call.

$$\text{c) Rate of return} = \frac{\text{Money made}}{\text{Money invested}} = \frac{100*(100 - 80) - 500}{6,000} = 25\%$$

- Regulations

- Government regulations

- Securities Act of 1933: requires full disclosure of relevant information related to the issue of new securities

- Securities Exchange Act of 1934: establish the Securities Exchange Commission (SEC)

- Securities Investor Protection Act: establish the Securities Investor Protection Corporation (SIPC)

- Self-regulations: by industries and exchanges themselves

- The Sarbanes-Oxley Act: passed by Congress in 2002 to enhance corporate governance

- Creation of the Public Company Accounting Oversight Board

- CEO and CFO must personally certify their firms' financial reports

- Auditors may no longer provide several other services

- The board of directors must be composed of independent directors

- Insider trading: trading with insider information, which is prohibited

- ASSIGNMENTS

1. Concept Checks and Summary
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3. Intermediate: 15, 16, 17, 20, 21, CFA 1 and 2

Chapter 4 - Mutual Funds and Other Investment Companies

- Investment companies
- Mutual funds
- Costs of investing in mutual funds
- Mutual fund returns
- Investing in mutual funds
- Exchange-traded funds

- Investment companies

An investment company is a type of financial intermediary. It sells itself to the public and uses the funds to invest in a portfolio of securities.

Mutual funds are investment companies (open-end).

Advantages of investing in mutual funds:

Economies of scale

Professional management

Diversification and divisibility

Record keeping and administration

NAV: the underlying value on a per share basis of a mutual fund

It is determined by the closing-bell prices and it varies every day

$NAV = (\text{market value of assets} - \text{liabilities}) / \text{number of shares outstanding}$

For example, a mutual fund has \$120 million in assets and 5 million of liabilities.

If it has 5 million shares outstanding, the net asset value (NAV) is \$23 per share.

Managed investment companies: open-end vs. closed-end

Open-end fund: investors can buy shares from or sell shares back to the fund at NAV (it may involve in purchase or redemption charges), with no limit on the number of shares the fund can issue

Closed-end fund: it is traded at prices that can differ from NAV and the number of shares outstanding is fixed

Unit investment trust: money pooled from many investors that is invested in a portfolio fixed for the life of the fund

Hedge fund: a private investment pool, open to wealthy or institutional investors, that is exempt from SEC regulations

Real estate investment trusts (REITs): similar to closed-end funds that invest in real estate or loans secured by real estate

- Mutual funds
 - Mutual funds are common names for open-end investment companies
 - More than 90% of mutual funds are open-end funds
 - Capital gains vs. current income
 - Investment policy: each fund has its policy contained in the fund's prospectus
 - Money market funds: invested in short-term and low-risk instruments
 - Equity funds: mainly invested in stocks, growth funds vs. income funds
 - Balanced funds: a balanced return from fixed income securities and long-term capital gains
 - Bond funds: invested in various bonds, more current income
 - Index funds: mimic market indexes (for example, S&P 500 index)
 - Sector funds: restrict investments in particular sectors (for example, financial service sector)
 - International funds: invested in international stocks
 - U.S. mutual funds by investment classification (Table 4.1)
- Costs of investing in mutual funds
 - Operating expenses: costs to operate the fund, including administrative expenses, ranging from 0.2% to 2.0%
 - Loads: commission charges, sales charges, or redemption charges
 - Front-end load: deduct a % charge from the initial investment (for example, 5%)
 - Low-load fund: less than 3% of front charge
 - Offering price = $NAV / (1 - \text{load})$ or $NAV = \text{offering price} * (1 - \text{load})$
 - No-load fund: selling at NAV, or offering price = NAV
 - Back-end load: a commission charge on the sale of shares
 - Other fees: for example, 12b-1 fees to cover marketing and distribution costs

- Mutual fund returns

Sources of return: dividend income; capital gains distributions; unrealized capital gains

$$\text{Rate of return} = \frac{\text{NAV}_1 - \text{NAV}_0 + I_1 + G_1}{\text{NAV}_0}$$

I_1 : income distribution during the period

G_1 : capital gains distribution during the period

Note: All fees are deducted directly from NAV

Example on return of a mutual fund, problem 4-21

At the start of the year: \$200 million in assets with no liabilities and 10 million shares outstanding

At the end of the year: dividend income \$2 million; no capital gains distribution; fund price rises by 8%, and 1% of 12b-1 fees is charged at the end of the year

Answer:

$$\text{NAV}_0 = \$20$$

$$\text{NAV}_1 = 20(1.08)(1-0.01) = \$21.384$$

$$I_1 = \$0.2 \text{ and } G_1 = 0$$

$$\text{Rate of return} = \frac{21.384 - 20.00 + 0.2}{20.00} = 7.92\%$$

- Investing in mutual funds

Wealth accumulation

Diversification

Professional management

Low cost

Speculation and short-term trading

Selection process

Objectives

What a fund offers – investment policy

Main holdings

Load vs. no-load funds

Open-end vs. closed-end funds

Taxation on mutual fund income

Long-term capital gains
Short-term capital gains
Dividends

If it is a retirement account (Roth IRA, regular IRA, 401K or 403B): all taxes are either exempt or deferred

Turnover ratio: the ratio of the trading activity of a portfolio to the assets of the portfolio

Example: see concept check 4.3

A portfolio is currently worth \$1,000,000. During the year, the investor sells 1,000 shares of FedEx at \$90 per share and 5,000 shares of Cisco at \$15 per share. The proceeds are used to buy 1,000 shares of IBM at \$165 per share.

a) What was the portfolio turnover ratio?

The turnover ratio is 16.50% ($1,000 \times 90 + 5,000 \times 15 = \$165,000$ in a \$1,000,000 portfolio)

b) If the shares of FedEx were purchased for \$80 per share and those of Cisco were purchased at \$12.50 per share, and if the investor's marginal tax rate is 15%, how much taxes the investor has to pay?

The realized capital gains for FedEx is $(90 - 80) \times (1,000) = \$10,000$

The realized capital gains for Cisco is $(15 - 12.50) \times (5,000) = \$12,500$

Total realized capital gains = \$22,500

Capital gains tax = $22,500 \times (0.15) = \$3,375$

- Exchange-traded funds (ETFs)
ETFs are offshoots of mutual funds that allow investors to trade index portfolios as if they were individual stocks

Most popular ETFs

Spider (SPDR) for S&P 500

Diamonds (DIA) for Dow Jones Industrial Average

Qubes (QQQ) for NASDAQ 100

- ASSIGNMENTS

1. Concept Checks and Summary
2. Key Terms
3. Intermediate: 11, 12, 13, 21, 22 and 24

Chapter 5 - Return and Risk

- Rates of return
- Risk and risk premium
- Historical return
- Inflation and real return
- Asset allocation

- Rates of return

Components of return: cash dividend and capital gains (or capital losses)

Total return (\$) = return from cash dividend + return from capital gains (or losses)

Total return (%) = dividend yield + capital gain yield

Holding period return (HPR):

$$\text{HPR} = \frac{\text{Ending price} - \text{Beginning price} + \text{Cash dividend}}{\text{Beginning price}}$$

Example

$P_0 = \$100$	Dividend = \$4
	$P_1 = \$110$
0	1

$\text{HPR} = (110 - 100 + 4) / 100 = (10 + 4) / 100 = 10\% + 4\% = 14\%$

Capital gains yield: % change in price, 10%

Dividend yield: % return from dividend, 4%

Returns over multiple periods

Table 5-1: Quarterly cash flows and rates of return of a mutual fund

	1 st quarter	2 nd quarter	3 rd quarter	4 th quarter
Assets at the start of quarter	1.0 mil	1.2 mil	2.0 mil	0.8 mil
Holding period return (HPR)	10.0%	25.0%	(20.0%)	20.0%
Total assets before net inflow	1.1 mil	1.5 mil	1.6 mil	0.96 mil
Net inflow	0.1 mil	0.5 mil	(0.8 mil)	0.6 mil
Assets at the end of quarter	1.2 mil	2.0 mil	0.8 mil	1.56 mil

Arithmetic mean: simple average, the sum of returns in each period divided by the number of periods - best forecast of performance in the future

$$\text{Arithmetic mean} = (10 + 25 - 20 + 20) / 4 = 8.75\%$$

Geometric mean: time-weighted average return (considers compounding)

$$(1 + 0.1) * (1 + 0.25) * (1 - 0.2) * (1 + 0.20) = (1 + r_G)^4$$

$$\text{Solve for } r_G = 7.19\%$$

Dollar-weighted average return: internal rate of return for a project

	Quarter				
	0	1	2	3	4
Net cash flow	-1.0	-0.1	-0.5	0.8	0.96

$$\text{IRR} = 3.38\%$$

APR (annual percentage rate) vs. EAR (effective annual rate)

$$\text{EAR} = \left(1 + \frac{\text{APR}}{n}\right)^n - 1$$

For example, APR = 6%, n = 4 (quarterly compounding), EAR = 6.14%

- Risk and risk premium

Probability distribution: a list of possible outcomes with associated probabilities

Expected return: the mean value of the distribution

Variance and standard deviation: measure of dispersion around the mean (risk)

Example

State of the Economy	Scenario, s	Probability, p(s)	HPR, r(s)
Boom	1	0.25	44%
Normal	2	0.50	14%
Recession	3	0.25	-16%

$$\text{Expected return} = E(r) = \sum_{s=1}^S p(s) * r(s) = 14\%$$

$$\text{Variance} = \sigma^2 = \sum_{s=1}^S p(s) * [r(s) - E(r)]^2 = 450;$$

$$\text{Standard deviation} = \sigma = \sqrt{\sigma^2} = \sqrt{450} = 21.21\%$$

Risk premium: expected return in excess of the risk-free rate, an additional return to compensate for taking risk

Risk aversion: reluctant to accept risk

$$E(r_p) - r_f = \frac{1}{2} A \sigma_p^2, \text{ where } A \text{ is the risk aversion coefficient or } A = \frac{E(r_p) - r_f}{\frac{1}{2} \sigma_p^2}$$

For example, if the risk premium is 8%, the standard deviation is 20%, then the risk aversion coefficient $A = 4$. The higher the risk aversion is for an investor, the higher the value of A , and the higher the risk premium.

$$\text{Sharpe (Reward-to-Volatility) ratio} = S = \frac{E(r_p) - r_f}{\sigma_p} = \frac{8\%}{20\%} = 0.4$$

(More discussions in Chapter 18)

- Historical return

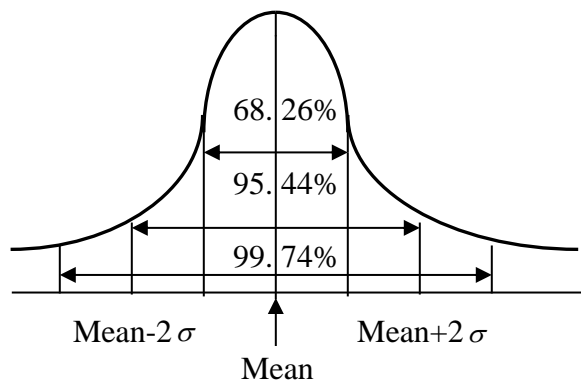
Using historical data to estimate mean and standard deviation

Example: MO

Historical returns: summary statistics for the U.S market and the world during 1926 - 2010 (Table 5.2)

Interpretation of the numbers

Normal distribution: 68.26% (1σ rule), 95.44% (2σ rule), and 99.74% (3σ rule) (Figure 5.1)



Size effect: average returns generally are higher as firm size declines

- Inflation and real return

Nominal interest rate vs. real interest rate

$r \approx R - i$ (the real rate, r is approximately equal to the nominal rate, R minus the inflation rate, i)

$$R = r + E(i)$$

Nominal interest rate = the real interest rate + expected inflation rate

Inflation rate is measured by consumer price index (CPI)

U.S. history of interest rates, inflation, and real interest rates

(Figure 5.5 and Table 5.3)

- Asset allocation

Asset allocation: portfolio choice among different investment classes

Risky assets vs. risk-free assets

All risky assets form a value-weighted risky portfolio, P

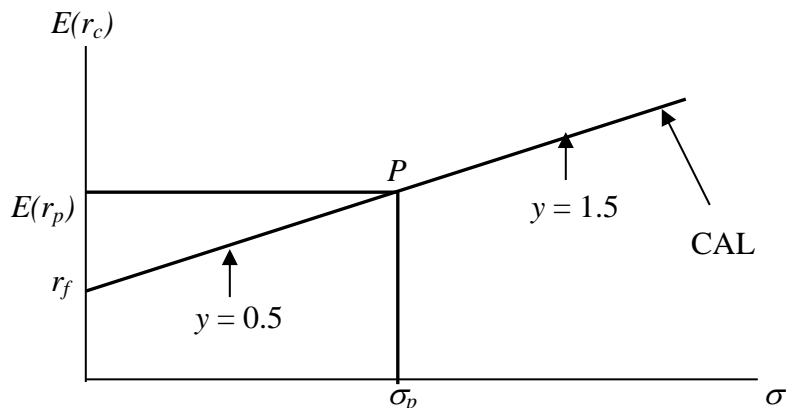
All risk-free assets form a risk-free asset with a risk-free rate, r_f

Complete portfolio: a portfolio including risky assets and risk-free assets

Complete portfolio's expected return and risk:

$$E(r_c) = y * E(r_p) + (1 - y) * r_f \quad \text{and} \quad \sigma_c = y * \sigma_p$$

Where $E(r_c)$ and σ_c are the expected rate of return and standard deviation for a complete portfolio, $E(r_p)$ and σ_p are the expected rate of return and standard deviation for the risky assets, r_f is the return on the risk-free asset, y is the weight on risky-assets, and $1 - y$ is the weight on the risk-free asset. The capital allocation line (CAL): a plot of risk-return combinations available by varying portfolio allocation (weights) between the risk-free asset and the risky portfolio.



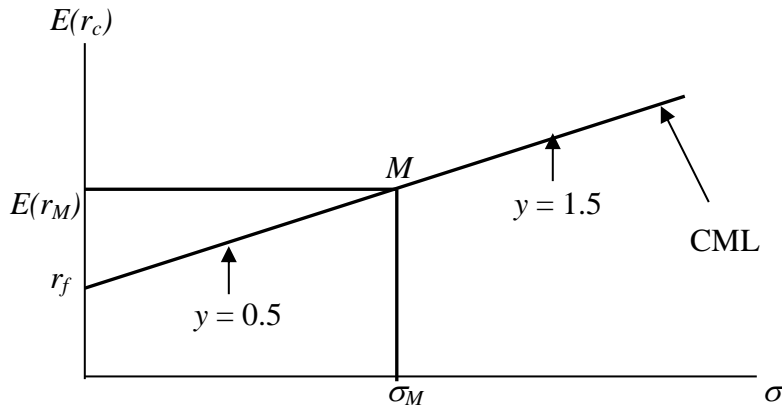
Example: if $E(r_p) = 15\%$, $\sigma_p = 22\%$, $r_f = 7\%$, $y = 50\%$, then

$$E(r_c) = 11\%, \sigma_c = 11\%, \text{ the Sharpe measure} = S = \frac{15\% - 7\%}{22\%} = 0.36$$

Challenge: if $y = 1.5$ what will happen to the complete portfolio? Where is it located on CAL? What is S ? What does it mean ($y = 1.5$)?

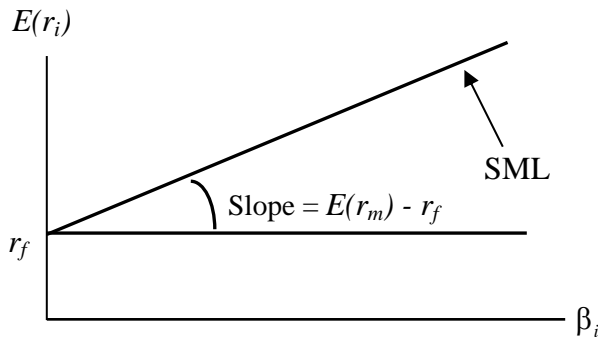
Passive investment strategy: holding a combination of a well-diversified market portfolio and a risk-free portfolio, assuming all risky assets are fairly priced.

Capital market line (CML): a capital allocation line using the market index portfolio as the risky portfolio



Capital Asset Pricing Model (CAPM) and its applications – a review of Fin 303

$$E(r_i) = r_f + \beta_i [E(r_m) - r_f] \quad \text{CAPM model}$$



- ASSIGNMENTS

1. Concept Checks
2. Key Terms
3. Intermediate: 5, 6, 12-16 and CFA 1-6