Essentials of Investments,

by

Bodie, Kane and Marcus

8th Edition,

Teaching Notes

CHAPTER ONE
INVESTMENTS: BACKGROUND AND ISSUES

CHAPTER OVERVIEW
The purpose of this book is to a) help students in their own investing and b) pursue a career in the investments industry. To help accomplish these goals Part 1 of the text (Chapters 1through 4) introduces students to the different investment types, the markets in which the securities trade and to investment companies. In this chapter the student is introduced to the general concept of investing, which is to forego consumption today so that future consumption can be preserved and hopefully increased in the future. Real assets are differentiated from financial assets, and the major categories of financial assets are defined. The risk/return tradeoff, the concept of efficient markets and current trends in the markets are introduced.   The role of financial intermediaries and in particular, investment bankers is discussed, including some of the recent changes due to the financial crisis of 2007-2008.

LEARNING OBJECTIVES
After studying this chapter, students should have an understanding of the overall investment process and the key elements involved in the investment process such as asset allocation and security selection. They should have a basic understanding of debt, equity and derivatives securities. Students should understand differences in the nature of financial and real assets, be able to identify the major players in the markets, differentiate between primary and secondary market activity, and describe some of the features of securitization and globalization of markets.

CHAPTER OUTLINE
1. Investing and Real versus Financial Assets

> PPT 1-2 through PPT 1-6

Investing involves sacrifice. One gives up some current consumption to be able to consumer more in the future (or to be able to consumer at all in the future if the goal is simply capital preservation.) Financial assets provide a ready vehicle to transfer consumption through time. They may be more appropriate investments than real assets for many investors. The distinctions between real and financial assets (see below) can be used to discuss key differences in their nature and in their appropriateness as investment vehicles. For instance, financial assets are more liquid and often have more transparent pricing since they are traded in well functioning markets. However, real asset investment generates growth in the capital stock and this allows a society to become wealthier over time.

The material wealth of a society will be a function of the inputs to production, including quality and quantity of its capital stock, the education, innovativeness and skill level of its people, the efficiency of its production, the rule of law, and so called 'Providential' factors such as location on a global trade route. The quantity and quality of its real assets will be a major determinant of that wealth. Real assets include land, buildings, equipment, human capital, knowledge, etc. Real assets are used to produce goods and services. Financial assets are basically pieces of paper that represent claims on real assets or the income produced by real assets. Real assets are used to generate wealth for the economy. Financial assets are used to allocate the wealth among different investors and to shift consumption through time. Financial assets of households comprise about 62% of total assets in 2008, up from 60% in 2006.

Interestingly, domestic net worth fell between September 2006 and June 2008 from $45,199 billion to $40,925 billion in 2008. This is due to the financial crisis and is due to the drop in real estate values. It is worth thinking about the implications of the wealth drop for consumer spending.

The discussion of real and financial assets can be used to discuss key differences in the assets and their appropriateness as investment vehicles. For instance, financial assets are more liquid and often have more transparent pricing since they are traded in well functioning markets.

2. A Taxonomy of Financial Assets

> PPT 1-7 through PPT 1-8

Fixed income securities include both long-term and short-term instruments. The essential element of debt securities and the other classes of financial assets is the fixed or fixed formula payments that are associated with these securities. Common stock on the other hand features uncertain residual payments to the owners. Typically preferred stock pays a fixed dividend but is riskier than debt in that there is no principal repayment and preferred stock has a lower claim on firm assets in the event of bankruptcy. A derivative is a contract whose value is derived from some underlying market condition such as the price of another security. The instructor may wish to briefly describe an option or a futures contract to illustrate a derivative. In a listed call stock option the option buyer has the right but not the obligation to purchase the underlying stock at a fixed price. Hence one of the determinants of the value of the call option will be the value of the underlying stock price.

3. Financial Markets and the Economy

> PPT 1-9 through PPT 1-17

Do market prices equal the fair value estimate of a security's expected future risky cash flows, all of the time, some of the time or none of the time?

This question asks whether markets are **informationally efficient**. The evidence indicates that markets generally move toward the ideal of efficiency but may not always achieve that ideal due to market psychology (behavioralism), privileged information access or some trading cost advantage (more on this later).

A related question may be stated as "Can we rely on markets to allocate capital to the best uses?" This refers to **allocational efficiency** and is related to the informational efficiency arguments above. If we don't believe the markets are allocationally efficient then we have to start discussing what other mechanisms should be used to allocate capital and the advantages and disadvantages of another system. Because it is likely that any other system of allocation will be far more inefficient this discussion is likely to cause most of us to conclude that a market based system is still the best even if ours is not perfectly efficient, … and what in life is?

Financial markets allow investors to shift consumption over time, and perhaps to make it grow through time. They allow investors to choose their desired risk level. A widow may choose to invest in a company's bond, rather than its stock, but a "YUPPIE" may choose to invest in the same company's stock in the hopes of higher return. Another investor may choose to invest in a government insured CD to eliminate any risk to the principal. Of course, the less risk an investor takes the lower the expected return.

The large size of firms requires separation of ownership and management in today's corporate world. The text states that in 2008 GE had over $800 billion in assets and over 650,000 stockholders. This gives rise to potential agency costs because the owners' interests may not align with managers' interests. There are mitigating factors that encourage managers to act in the shareholders' best interest:

- Performance based compensation
- Boards of Directors may fire managers
- Threat of takeovers

Text Application 1.2 is summarized in slide 1-14 and can be used to generate class discussions.

- In February 2008, Microsoft offered to buy Yahoo at $31 per share when Yahoo was trading at $19.18.
- Yahoo rejected the offer, holding out for $37 a share.
- Billionaire Carl Icahn led a proxy fight to seize control of Yahoo's board and force the firm to accept Microsoft's offer.
- He lost, and Yahoo stock fell from $29 to $21.
- Did Yahoo managers act in the best interests of their shareholders?

The answer to this question really revolves around whether you believe stock prices reflect the long term prospects of firm performance or are focused primarily on short term results. Despite some long time periods to the contrary, stock prices do tend to conform to their fundamental values over the long term. In this case Yahoo managers were acting in the best interest of their shareholders only if they had sufficiently positive inside information and/or they believe an offer of $37 a share would be forthcoming.

Corporate Governance and Ethics
Businesses and markets require trust to operate efficiently. Without trust additional laws and regulations are required and all laws and regulations are costly. Governance and ethics failures have cost our economy billions if not trillions of dollars and even worse are eroding public support and confidence in market based systems of wealth allocation. PPT slide 1-16 and 1-17 list some examples of failures and some of the major effects of the Sarbanes-Oxley Act. For a lucid article on ethics and the financial crisis see. "Can Ethical Restraint Be Part of the Solution to the Financial Crisis?," by Stephen Jordan, a fellow of the Caux Round Table for Moral Capitalism for a Better World. The article may be found at
http://www.cauxroundtable.org/newsmaster.cfm?&menuid=99&action=view&retrieveid=12

4. The Investment Process

> PPT 1-18

The two major components of the investment process are described in PPT 1-18, namely asset allocation and security selection. An example asset allocation is provided to illustrate the concept.

5. Markets are Competitive

> PPT 1-19 through PPT 1-22

Previewing the concept of risk-return trade-off is important for the development of portfolio theory and many other concepts developed in the course. The discussion of active and passive management styles is in part related to the concept of market efficiency. The discussion of market efficiency ties directly with the decision to pursue an active management strategy. If you believe that the markets are efficient then a

passive management strategy is appropriate because in this case no active strategy should consistently improve the risk-return tradeoff of a passive strategy. Active strategies assume that trading will result in an improvement in the risk-return tradeoff of a passive strategy after subtracting trading costs.

The two major elements of active management are security selection and timing. Material in later chapters can be previewed in terms of emphasis on elements of active management. The essential element related to passive management is related to holding an efficient portfolio. The elements are not limited to pure diversification concepts. Efficiency also is related to appropriate risk level, the cash flow characteristics and the administration costs.

6. The Players

> PPT 1-23 through PPT 1-29

Some of the major participants in the financial markets are listed in PPT 1-24. Governments, households and businesses can be issuers and investors in securities. Investment bankers bring issuers and investors together. The primary and secondary markets are defined in PPT 1-25 and the underwriting function is introduced. Slides 26 and 27 discuss some of the history of the separation of commercial and investment banking, the changes resulting from regulatory changes and then the collapse of the major investment banks in the recent crisis. In 1933 the Glass-Steagall act strictly limited the activities of commercial banks. An institution could not accept deposits and underwrite securities. In 1999 the Financial Services Modernization Act formally did away with Glass-Steagall restrictions. In reality, commercial and investment bank functions were blended long before 1999 and cross functionality actually began after the 1980 Depository Institution Deregulation and Monetary Control Act (DIDMCA).

For more detail a timeline of the financial crisis may be found at:
http://timeline.stlouisfed.org/pdf/CrisisTimeline.pdf

Summary statistics for commercial banks' and nonfinance U.S. business' balance sheets for 2008 are displayed in PPT 1-28 and in PPT 1-29.

7. Recent Trends

> PPT 1-30 through PPT 1-40

Globalization

Globalization, falling information costs, increasing transparency and the move toward global accounting standards will provide investors with opportunities for better returns & for lower risk through improved diversification of international investments. It may however increase exposure to foreign exchange risk. However, in today's globalized economy investors will face exchange rate risk even if they hold a purely domestic portfolio because the companies face exchange rate risk exposure on a transaction and a strategic level.

New instruments and investment vehicles that grant international exposure continue to develop. For example 1) ADRs: American Depository Receipts: ADRs May be listed on an exchange or trade OTC in the U.S. A broker purchases a block of foreign shares, deposits them in a trust and issues ADRs in the U.S. they trade in dollars, receive dividends in dollars and have the same commissions as any other stock. You can buy ADRs on Sony for example. 2) WEBS are World Equity Benchmark Shares; these are the same as ADRs but are for portfolios of stocks. Typically WEBS track the performance of an index of foreign stocks.

Securitization

Securitization is the transformation of a non-marketable loan into a marketable security. Loans of a given type such as mortgages are placed into a 'pool' and new securities are issued that use the loan payments as collateral. The securities are marketable and are purchased by many institutions. Securitization is why the so called "Shadow banking system" is so important to the U.S. economy now. The end result of securitization is more investment opportunities for purchasers, and the spreading of loan credit risk among more institutions.

Several good examples of securitization are presented in the chapter. The historical development of securitization of different underlying assets can be tied to improved technology and information. The market initially developed with pass-through securities on home mortgages. The importance of credit enhancement, the process of some additional party guaranteeing the performance on the securities, was apparent from the initial development of the market. Initially, performance was partially guaranteed by the government or an agency of the government. As the market grew to include other assets such as charge card receivables and automobile loans, private firms became involved in the credit enhancement process. There seems to be no limit to the assets that can be securitized. Securitization may receive an excessive amount of blame for the current crisis and issuance of asset backed securities fell precipitously in 2008. Securitization may lead to lower credit standards in the loan origination process because the originator plans on selling the loan to another investor. This form of moral hazard may be limited by requiring the originator to retain some portion of the loans. Capital requirements for securitized loans have also been inadequate and regulatory changes are needed. Nevertheless securitization creates new investment opportunities for institutions and allows risk sharing among more institutions. We are seeing the downside of this now because of the systemic risk of the mortgage market but in normal times securitization allows a greater volume of credit to be available than would otherwise be the case. This may allow for faster growth while keeping interest rates lower than they would be otherwise in periods of growth.

Financial Engineering

The securities industry has been very active in the area of financial engineering. The process of financial engineering involves repackaging the cash flows from a security or an asset to enhance their marketability to different classes of investors. This activity will continue as long as financial intermediaries can add value to the total by repackaging the cash flows.

Bundling of cash flows results from combining more than one asset into a composite security, for example securities sold backed by a pool of mortgages. Unbundling cash flows results from selling separate claims to the cash flows of one security, for example a CMO. A CMO is a collateralized mortgage obligation. It is a type of mortgage backed security that takes payments from a mortgage pool and separates them into separate classes of payments that investors can buy. A CDO (collateralized debt obligation) is also an unbundling example. A simpler version of unbundling would be a Treasury Strip. Recently firms such as AIG (and many hedge funds) have used default swaps to create synthetic collateralized debt obligations.

Computer Networks

The usage of computer networks for trading continues to grow. Recent trends include the growth of

online low cost trading, reduction in cost of information production and increase in availability, and growth of direct trading among investors via electronic communication networks.

What have been the effects on Wall Street firms' profit margins?
How has Wall Street responded?
Computerization has pressured profit margins of Wall Street firms. Similarly technological advances that promoted widespread securitization changed the business model of commercial banks. Both responded by engaging in riskier trading activities and increasing leverage to bolster rates of return. It could be argued this helped set up the financial crisis of 2007-2008 as they took on more risk to restore margins.

In the future investors will have even larger capabilities to invest in a broader range of investment vehicles. Understanding valuation principles for common stock and the portfolio concepts covered in the text are the basis for valuation of the many investment choices available.

The Future
In the future, globalization will continue and investors will have far more investment opportunities than in the past particularly after the crisis passes. Securitization will continue to grow after the crisis.
There will be continued development of derivatives and exotics, although I expect we will see more regulation for "over the counter" derivatives. As a result a strong fundamental foundation of understanding investments is critical. It may also be worth mentioning that understanding corporate finance requires understanding investment principles.

CHAPTER TWO
ASSET CLASSES AND FINANCIAL INSTRUMENTS

CHAPTER OVERVIEW
One of the early investment decisions that must be made in building a portfolio is the asset allocation decision. This chapter introduces some of the major features of different asset classes and some of the instruments within each asset class. The chapter first covers money market securities. Money markets are the markets for securities with an original issue maturity of one year or less. These securities are typically marketable, liquid, low risk debt securities. These instruments are sometimes called 'cash' instruments or 'cash equivalents,' because they earn little, and have little value risk. After covering money markets the chapter discusses the major capital market instruments. The capital market discussion is divided into three parts, long term debt, equity and derivatives. The construction and purpose of indices are also covered in the capital markets section.

LEARNING OBJECTIVES
Upon completion of this chapter the student should have an understanding of the various financial instruments available to the potential investor. Readers should understand the differences between discount yields and bond equivalent yields and some money market rate quote conventions. The student should have an insight as to the interpretation, composition, and calculation process involved in the various market indices presented on the evening news. Finally, the student should have a basic understanding of options and futures contracts.

CHAPTER OUTLINE

PPT 2-2 and PPT 2-3

The major classes of financial assets or securities are presented in PPT slides 2 and 3. This material can be used to discuss the chapter outline and the purposes of these markets. Instruments may be classified by whether they represent money market instruments, which are primarily used for savings, or capital market instruments. Savings may be defined as short term investments that pay a low rate of return but do not risk the principal invested.   Capital market investments will entail chance of loss of some or even all of the principal invested but promise higher rates of return that allow significant growth in portfolio value.

1. Money Market Instruments

PPT 2-4 through PPT 2-16

The major money market instruments that are discussed in the text are presented in PPT 2-4 through PPT 2-16. Treasury bills, certificates of deposit (CDs) and commercial paper are covered in the most detail. The issuer, typical or maximum maturity, denomination, liquidity, default risk, interest type and tax status are presented for these instruments. The majority of undergraduate students will have very little knowledge of the workings of these investments and this is very useful information for them. Generally less detail is provided for bankers' acceptances, Eurodollars, federal funds, LIBOR, repos and the call money rate but the main features of these instruments are covered. PPT slides 2.12 through 2.15 give data on money market rates, the amounts of the different security types and spreads between CDs and T-bills. Notice the big run up in spreads during the recent crisis. Make sure students understand the

meaning of credit spreads as this is a major predictor of market conditions. See for instance **A Warning From the Bond Market, Heard on the Street, By Justin LaHart, Wall Street Journal Online, April 9, 2009**.

Money market mutual funds (MMMF) and the Credit Crisis of 2008:
Between 2005 and 2008 money market mutual funds (MMMFs) grew by 88%. Why? After years of declining growth rates, MMMF inflows accelerated rapidly as investors fled risky assets during the crisis and sought safety in money funds. However, MMMFs had their own crisis in 2008 after Lehman Brothers filed for bankruptcy on September 15 because some money funds had invested heavily in Lehman commercial paper. On Sept. 16 a MMMF, the Reserve Primary Fund, "broke the buck." What does this mean? MMMF shares normally have a value of $1.00 plus any accrued interest, but fund shares are never supposed to fall below $1.00. Some investors use these funds to pay bills as most have a checking feature and count the shares maintaining their value. Reserve Primary Fund shares fell below $1.00 as the fund's losses mounted. A run on money market funds ensued. The U.S. Treasury temporarily offered to insure all money funds (for an insurance fee) to stop the run (there are about $3.4 trillion in these funds.)

Money market yields:

> PPT 2-17 through PPT 2-25

Money market yield sample calculations are presented and illustrated in this set of slides. The bank discount rate r_{BD} is compared to the bond equivalent yield r_{BEY} and the effective annual yield r_{EAY}. These slides are formatted so that the instructor can ask students to calculate them and then provide students with the answers.
r_{BD} is calculated as a return as a percentage of the face value or par value of the instrument and is quoted as annualized without compounding using a 360 day year. r_{BEY} is calculated as a return as a percentage of the initial price of the instrument and is quoted as annualized without compounding using a 365 day year:

$$r_{BD} = \tfrac{Par-Price}{Par} \times \frac{360}{n} \quad r_{BEY} = \tfrac{Par-Price}{Price} \times \frac{365}{n} ; \quad n = \text{maturity in days}$$

The r_{EAY} = holding period return as a percent of price but is annualized with compounding using a 365 day year.

$$r_{EAY} = \left[(1 + \tfrac{Par-Price}{Price})^{365/n} \right] - 1$$

Examples are included with the slides. Note that the following relationship will normally hold:
$r_{EAY} > r_{BEY} > r_{BD}$ ceteris paribus.

<div align="center">Money Market Instruments and Yield Type</div>

• Treasury bills	Discount
• Certificates of deposit	BEY*
• Commercial Paper	Discount
• Bankers Acceptances	Discount
• Eurodollars	BEY*
• Federal Funds	BEY*
• Repurchase Agreements (RPs) and Reverse RPs	Discount

* Note that CDs, Euro$ and Federal Funds all use add on quotes which are not quite the same as BEY, since the add on uses a 360 day year. However, "add ons" are not covered in the text. To convert from add on to BEY use the following: BEY = $r_{add\ on}$ * (365/360)

Capital Market Instruments
2. The Bond Market

PPT 2-26 through PPT 2-38

Debt instruments are issued by both government (sometimes called public) and by private entities. The Treasury and Agency issues have the direct or implied guaranty of the federal government. As state and local entities issue municipal bonds, performance on these bonds does not have the same degree of safety as a federal government issue. The interest income on municipal bonds is not subject to federal taxes so the taxable equivalent yield is used for comparison.

Fixed income securities have a defined stream of payments or coupons. Treasury notes have a maturity up to and including 10 years, bonds mature beyond 10 years. The minimum denomination is $100, but most have a $1,000 denomination, although many T-bonds are now packaged and sold in multiples of $1,000. Treasury bonds pay interest semiannually with principal repaid at maturity (non-amortizing). Most are callable after an initial call protection period. Investors pay federal taxes on capital gains and interest income, but interest income is exempt from state and local taxes.

Agency issues have either explicit or implicit backing by the Federal Government and their securities normally carry an interest rate only a few basis points over a comparable maturity Treasury. Federal agencies have different charters but generally are charged with assisting socially deserving sectors of the economy in obtaining credit. The major example is housing, although farm lending and small business loans are other good examples. The major agencies are home mortgage related however and include the Federal National Mortgage Association (FNMA or Fannie Mae), the Federal Home Loan Mortgage Corporation (FHLMC or Freddie Mac), the Government National Mortgage Association (GNMA or Ginnie Mae) and the Federal Home Loan Banks. GNMA has always been a government agency. GNMA backs pools of FHA and VA insured mortgages (for a fee) created by private pool organizers. FNMA was originally a government agency that provided financing to originators of FHA and VA mortgages, but was privatized in 1968. FHLMC was created in 1972 to assist in financing of conventional mortgages. In September 2008, the federal government took over FNMA and FHLMC and created a new regulator, the Federal Housing Financing Authority. FNMA and FHLMC together finance or back about $5 trillion in home mortgages. This represents about 50% of the U.S. market.

Municipal bonds are issued by state and local governments. Interest on municipal bonds is not taxed at the federal level and is usually not subject to state and local taxes if the investor purchases a bond issued by an entity in their state of residence. To compare corporate yields with municipal yields you must calculate the taxable equivalent yield. The conversion formula is:

$r_{Tax\ Exempt} = r_{Taxable} \times (1 - Tax\ Rate)$

Municipal bonds may be general obligation (G.O.) or revenue bonds. G.O. bonds are backed by the full taxing power of the issuing municipality whereas revenue bond payments are collateralized only by the revenue of a specific project and hence tend to be riskier. Industrial development bonds are municipal issues where the money is used for industrial development in the local municipality. This may involve

using the money to assist a specific business to encourage that firm to locate a facility in the municipality.

Private Issues:
Private issues include corporate debt and equity issues and asset backed securities, including mortgage backed securities. Bonds issued by private corporations are subject to greater default risk than bonds issued by government entities. Corporate bonds often contain imbedded options such as a call feature which allows an existing corporation to repurchase the bond from issuers when rates have fallen. Some bonds are convertible which allows the bond investor to convert the bond to a set number of shares of common stock. Most bonds are rated by one or more of the major ratings agencies approved by the federal government. The major agencies are Standard & Poors, Moody's and Fitch. The rating measures default risk. The higher the rating the lower the interest rate required to issue the bonds. The two major classes of bonds with respect to default risk are investment grade and speculative grade. Investment grade bonds are much more marketable and carry significantly lower interest rates than speculative grade bonds. Speculative grade bonds are euphemistically called 'junk' bonds. Spreads on junk bonds reached record highs in 2008 and 2009.

The **mortgage market** is now larger than the corporate bond market. Securities backed by mortgages have also grown to compose a major element of the overall bond market. A pass-through security represents a proportional (pro-rata) share of a pool of mortgages. The mortgage backed market has grown rapidly in recent years as shown in Text Figure 2.7. Originally only "**conforming mortgages**" were securitized and used to back mortgage securities. Conforming mortgages met traditional creditworthiness standards such as a maximum 80% loan to value ratio, maximum debt to income ratio of around 30% and a quality credit score. Until about 2006, Fannie and Freddie only underwrote or guaranteed conforming mortgages. Under political pressure to make housing available to low income families however, Fannie and Freddie began securitizing and backing subprime mortgages (mortgages to households with insufficient income to qualify for a standard mortgage) and so called "Alt-A" mortgages which lie between conforming and subprime in terms of credit risk. Amazingly, most of the mortgages in the lower quality categories originated since 2006 have deteriorated in value. As of this writing home prices are down 29% from their peak with further declines still likely. As of early 2009 there was about 11 months supply of unsold homes on the market and millions of homeowners were 'underwater' on their mortgages. The term underwater means the homeowners owe more than the value of their home, creating an incentive to default. Foreclosures depress local home prices, and add to the credit problems of banks and thrifts that supply mortgage credit, hence the government's efforts to limit the number of foreclosures.

3. Equity Securities

PPT 2-39 through PPT 2-43

Several key points are relevant in the discussion of equity instruments. First, common stock owners have a residual claim on the earnings (dividends) of the firm. Debt holders and preferred stockholders have priority over common stockholders in the event of distress or bankruptcy. Stockholders do have limited liability and a shareholder cannot lose more than their initial investment. Common stockholders typically have the right to vote on the board of directors and the board can hire and fire managers. Even though stockholders have the right to vote it may be difficult to effect change because of a low concentration of stock holdings among many small investors. For instance in the April 2009 shareholder meeting of

Citicorp shareholders all existing directors were reelected even though many shareholders were very vocal in their disapproval of Citi's performance (Citi had abysmal performance in 2008 and had to be bailed out by the government and most shareholder value was destroyed). Michael Jacobs, a former Treasury official, wrote in The Wall Street Journal that Citicorp had few directors with experience in the financial markets and GE had only one director with experience in a financial institution even though GE Capital is a major component of the firm. Problems at GE Capital led to a loss of GE's AAA credit rating.[1]

Preferred shareholders have a priority claim to income in the form of dividends. Ordinary preferred stockholders are limited to the fixed dividend while common shareholders do not have limits. The partial tax exemption on dividends of one corporation being received by another corporation is important in discussing preferred stock. Preferred & common dividends are not tax deductible to the issuing firm. Corporations are given a tax exemption on 70% of preferred dividends earned.

Capital gains and dividend yields
You buy a share of stock for $50, hold it for one year, collect a $1.00 dividend and sell the stock for $54. What were your dividend yield, capital gain yield and total return? (Ignore taxes)
- o Dividend yield: = Dividend / P_{buy} or $1.00 / $50 = 2%
- o Capital gain yield: = $(P_{sell} - P_{buy})$/ P_{buy} or ($54 - $50) / $50 = 8%
- o Total return: = Dividend yield + Capital gain yield

$$2\% \quad + \quad 8\% \quad = 10\%$$

4. Stock and Bond Market Indexes

PPT 2-44 through PPT 2-54

Stock indices are used to track average returns, compare investment managers' performance to an index and are used as a base for derivative instruments. Key factors to consider in constructing an index include a) what the index is supposed to measure, b) whether a representative sample of firms can be used or whether all firms must be included, c) how the index should be constructed. The examples of domestic indices displayed in the PPT slides illustrate the diversity of indices in use. The Wilshire, being the broadest of the indices, captures the overall domestic market. The DJIA captures the returns from the 'bluest of blue chips' or a sample of very large well known firms. The sample of domestic indices also fit well with discussion of uses of the index. If the index will be used to assess the performance of a manager that invests in Small-Cap firms, the DJIA would not be as appropriate a benchmark as the NASDAQ Composite.

The creator of an index must decide how to weight the securities included in the index. Price weighted indices use the stock's price as the weight for that security. Price weighted averages are probably the poorest form of index because high price stocks have a bigger weight in the index (and there is no theoretical reason for this) and stock splits arbitrarily reduce that weight. The other choices are market value weighted (most common) and equal value weighted. Which of these two is better depends on what you are after. In a value weighted index the amount invested in each stock in the index is proportional to the market value of the firm. The market value of the firm is the weight for each stock and changes in the

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[1] How Business Schools Have Failed Business: Why Not More Education on the Responsibility of Boards? by Michael Jacobs, The Wall Street Journal Online, April 24, 2009.

value of larger firms affect the index more than changes in the value of the stock of a firm with smaller market capitalization. Value weighted indices are more common and are probably a better indicator of the overall change in wealth in the stocks of interest. The theoretical market portfolio of all risky assets is value weighted. In constructing an equal weighted index an equal amount of money is assumed to be invested in each stock and changes in the value of small firm and large firm stocks affect the index value identically. While this method is not as commonly used in many published indices, it is commonly used in research and is important in describing results of empirical examinations on market efficiency discussed in later chapters. Also if an investor actually does put equal dollar amounts into various stocks then an equal weighted index is probably the better benchmark. The PPT slides contain sample calculations of price weighted, value weighted and equal weighted indices for a simple three stock index.

The international indices in PPT 2.54 represent indices that have popular appeal. They include only a small example of what is available but they are representative of the major types of indices and major countries. The text has other examples of various indices.

5. Derivative Securities

PPT 2-55 through PPT 2-63

Listed call options are explained and illustrated on slides 55 through 59. Calls and puts are defined and Text Figure 2.10 is used to illustrate option quotes and very basic option positions. The effect of exercise price and time to expiration on a call and a put are illustrated with this figure. A very basic definition of a futures contract is provided on PPT slide 60 and Figure 2.11 is used to illustrate how to read a futures price quote for a corn futures contract.

The main point to emphasize in the option and futures discussion is that futures entail a commitment to a future purchase or sale whereas options give the holder the right to buy (with a call) or sell (with a put) the underlying commodity. The instructor should be aware that options and futures markets are highly competitive. On the whole many futures markets are cheaper and more liquid than options markets. The 'right' associated with the option is more expensive. PPT slide 63 can be used as a brief quiz for the students to ensure they understand the differences between the contracts.

6. Selected Problems:

PPT 2-64 through PPT 2-69

PPT slides 64-69 contain some worked out solutions to problems similar to the homework problems at the end of the chapter. The numbers may or may not be the same as in the 8th edition. The instructor may cover these if he or she wishes as time permits. Simply hide any slides that you do not wish to cover.

CHAPTER THREE
SECURITIES MARKETS

CHAPTER OVERVIEW
This chapter discusses how securities are traded on both the primary and secondary markets, with coverage of both organized exchanges and over the counter markets. Margin trading and short selling are discussed along with numerical examples. The chapter discusses securities regulations and the self-regulatory organizations.

LEARNING OBJECTIVES
After studying this chapter the student should understand the primary market issue methods and how investment bankers assist in security issuance. The reader should be able to identify the various security markets and should understand the differences between exchange and over the counter trading. The student should understand the mechanics, risk, and calculations involved in both margin and short trading and should begin to understand some of the implications, ambiguities, and complexities of insider trading and the regulations concerning these issues.

CHAPTER OUTLINE
### 1. How Firms Issue Securities

PPT 3-3 through PPT 3-11

The term primary market refers to the market where new securities are issued and sold. The key characteristic of this market is that the issuer receives the proceeds from the sale. In the secondary market existing securities are traded among investors. The issuing firm doesn't receive any proceeds and is not directly involved.

If a primary market offering is made to the general public (a public offering) it must be registered with the Securities Exchange Commission or SEC. SEC approval indicates the issuer has divulged sufficient information for the public to evaluate the offering. Private offerings are not registered, and may be sold to only a limited number of investors, with restrictions on resale.

Investment bankers are typically hired to assist in the issuance process. In a fully underwritten general cash offer (the most common) the banker buys the issue from the issuing firm and pays the bid price. The banker then resells the issue to the public at the ask or offer price. The term underwriting is an insurance term that means to take on the risk. The difference between the bid and ask price as a percent of the ask price is called the bid-ask spread and this spread represents an issuance cost. A GCO can be used for an IPO or a seasoned offering. An IPO is the initial public offering whereas a seasoned offering is issuing additional equity after the firm's IPO. The typical spread for an equity IPO is 7%. IPOs are very expensive. In addition to out of pocket costs which may range from $300,000 to $500,000 depending on issue size, most IPOs are underpriced. The investment banker has an incentive to underprice an issue to limit its risk in reselling the issue to the public. Underpricing is a global phenomenon and can be greater than the total out of pocket expenses to market an issue. Underpricing averages about 10%. Investment bankers conduct a nationwide 'road show' using a shortened version of the registration statement called a prospectus to solicit interest in a security offering. In the road show a team of bankers and issuing firm executives will visit brokerage clients and put on a 20 to 40 minute

presentation explaining what the issuing firm does and why the security is a good buy. The road show allows the investment banker to build 'the book' which contains an indication of interest to buy at a given price. This allows the banker to estimate the demand and to set a price. Many issues are oversubscribed. This means that customers want to buy more shares than are being offered. This allows the banker to allocate the shares to their better customers and creates a 'winner's curse' problem for a smaller investor. The IPO you can actually get is not going to be a good IPO, otherwise it would be oversubscribed and you wouldn't receive any shares. The oversubscription led to many abuses by Wall Street bankers with bankers allocating shares to firms in exchange for subsequent underwriting business and other perquisites. These activities are illegal and led to large fines for many investment bankers.
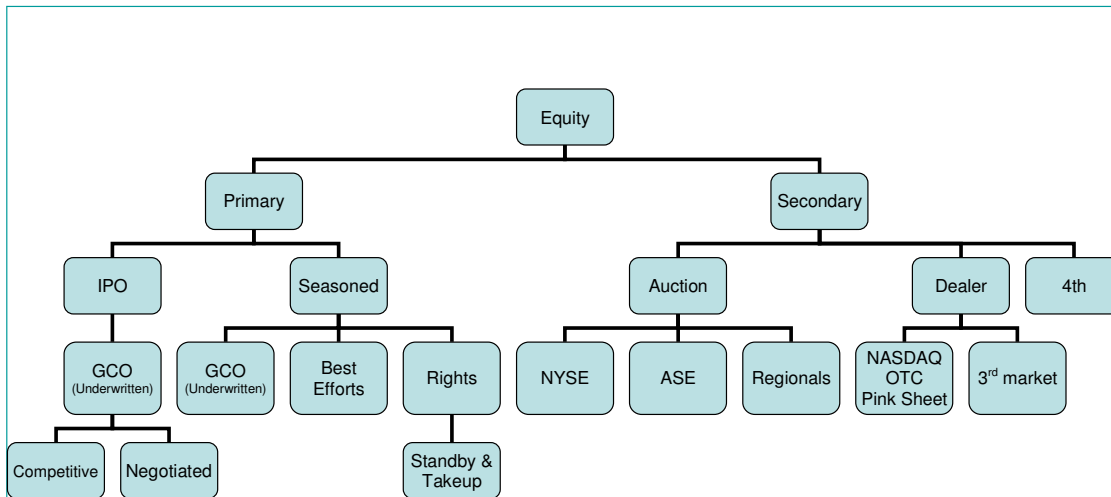
GCOs may be competitive or negotiated. In a competitive GCO the issuing firm solicits sealed bids from competing investment banks. In a negotiated deal (by far the most common), the issuing firm works with a lead underwriter to negotiate the terms of the deal. Municipalities may be required to use a competitive bid process when issuing municipal bonds. Seasoned equity offerings may employ an issue method termed "Best Efforts," whereby the investment banker does not buy the issue from the issuing firm, but rather the banker uses their brokers to employ their "best efforts" to sell the security to the public. This is rather infrequently used. Some firms issue rights offerings. In a rights offering the new issue is first offered to the existing owners. Some corporate charters require this method. The right to purchase a given amount of new shares per share owned is mailed out to existing stockholders who then have a time period to exercise their right. In a standby and takeup version of the rights offer the investment banker is hired to 'standby' and 'takeup' or buy and new shares that the existing shareholders don't want.

SEC Rule 415 allows shelf registrations. Shelf registrations allow a firm to pre-register securities it wishes to sell to the public. Once the shelf registration is approved the firm may issue the securities at any time within two years by providing the SEC with 24 hour notice of issuance. This allows the issuer greater flexibility in timing when to market the issue. There are certain minimum firm size restrictions to qualify and firms cannot have had recent violation of certain securities laws and disclosure requirements. Certain private placements rules are governed by SEC Rule 144A. Private placements allow a firm to sell securities without going through a registered public offering and will have lower flotation costs. While most stock offerings employ public offerings, many issues of debt are completed using private placements. It is useful to discuss differences in the markets for equity and bonds when discussing this

material. Bond markets are dominated by financial institutions and many of the special characteristics of bond issues lend themselves to private placements. In some years the volume of private placements exceeds public offerings of corporate bond issues.

2. How Securities Are Traded

PPT 3-12 through PPT 3-18

The overarching purpose of financial markets is to facilitate low cost investment. If the instructor wishes he or she may go into more detail as follows:

a) Markets bring together buyers and sellers at low cost and there are different types of markets:
- Direct search market:
    - Buyers and sellers locate one another on their own

- Brokered market:
    - 3rd party assistance is used in locating a buyer or seller

- Dealer market:
    - 3rd party acts as intermediate buyer/seller

- Auction market:
    - Brokers & dealers trade in one location, trading is more or less continuous

b) Well functioning markets provide adequate liquidity by minimizing time and cost to trade and promoting price continuity.

c) Markets should set & update prices of financial assets in such a way as to facilitate the best allocation of scarce resources to investments that will generate the greatest growth in wealth while considering the riskiness of the investment. This function reduces the information costs associated with investing and encourages more people to invest which also allows firms to raise money more cheaply which in turn encourages faster economic growth.

Types of Orders
a) Order type
Market orders execute immediately at the best price. Limit orders are order to buy or sell at a specified price or better. On the exchange the limit order is placed in a limit order book kept by an exchange official or computer. For example, if a stock is trading at $50 an investor could place a buy limit at $49.50 or a sell limit order at $50.25. The limit order may or may not execute depending on which way the market price moves. How far away from the current price the limit should be set will depend on the price the investor is willing to get but setting the price further from the current market reduces the probability of execution.

Stop loss and stop buy orders are also available. A stop loss order becomes a market sell order when the trigger price is encountered. For example, you own stock trading at $40. You could place a stop loss at $38. The stop loss would become a market order to sell if the price of the stock hits $38. Similarly a

stop buy order becomes a market buy order when the trigger price is encountered. For example, suppose you shorted stock trading at $40. You could place a stop buy at $42. The stop buy would become a market order to buy if the price of the stock hits $42. Notice that in both these the investor is NOT guaranteed to transact at the trigger price. Rather the stop order will transact at the next transaction which may or not occur at exactly the trigger price although it should be close. An investor can also give the broker a discretionary order, to buy or sell at the broker's discretion but the investor should really trust the broker. Brokers typically profit when the customer trades so churning (excessive trading recommendations to generate commissions) is a possibility.

b) Time dimensions on orders: Limits and stop orders also have a time dimension. These orders may be immediate or cancel (IOC), good for the day only (Day) (typically the default), or good till cancelled (GTC).

3. U.S. Securities Markets

PPT 3-19 through PPT 3-36

A dealer market is a market without *centralized order flow*. The NASDAQ is a dealer market.

NASDAQ is the largest organized stock market for over the counter or OTC trading. NASDAQ is a computer information system for individuals, brokers and dealers. It connects more than 350,000 terminals and processes more than 5,000 transactions per second (Source: NASDAQ). Securities traded included stocks, most bonds and some derivatives. The country's largest firms typically trade on the New York Stock Exchange (NYSE). NASDAQ securities tend to be securities of midmarket and smaller firms and NASDAQ has several divisions that correspond to the different size firms. The NASDAQ website has details about the different divisions. Text Table 3.1 contains partial listing requirements for NASDAQ. Stocks that have insufficient trading interest to meet NASDAQ inclusion requirements may trade on the OTC Bulletin Board. The Bulletin Board has no listing requirements. Truly illiquid stocks are referred to as "Pink Sheet" stocks. See www.pinksheets.com for details.

Auction markets are markets with *centralized order flow*. In these markets the dealership function can be *competitive or assigned* by the exchange as in the case of *NYSE Specialists*. Examples include the NYSE, the American Stock Exchange (ASE), the Chicago Board Options Exchange (CBOE), the Chicago Mercantile Exchange (CME) and others. Typical exchange participants are described in PPT slide 26 through 29. The unique role of the specialist deserves some attention. The specialist is an exchange appointed firm in charge of the market for a given stock. A specialist acts as both a broker and a dealer in the market. The specialist is charged with maintaining a continuous, orderly market. To do so at times the specialist will have to trade against a market trend, buying when everyone else is selling and vice versa. Specialists will lose money under these conditions and may petition the exchange to halt trading if their losses mount. Specialists also act as brokers and receive a commission on trades they facilitate. Commission income has been reduced in recent years as competition from other trading platforms, particularly ECNs has reduced the volume of trading involving the specialists. Several firms have quit. The cut in specialist profit margins also led to ethical breaches with some specialists engaging in front running customers. (In front running the specialist trades for their own account ahead of the customer's orders anticipating which way the orders will move the share price.)

PPT slides 30 and 31 discuss order execution and how execution may be improved in an auction style market. Slides 32 through 34 cover electronic trading, block houses and Electronic Communication Networks (ECNs). This section concludes with slides 35 and 36 which present some recent mergers and acquisitions in the markets. The increase in electronic trading and the investment this requires are creating economies of scale and scope that are encouraging mergers.

4. Market Structure in Other Countries

> PPT 3-37 through PPT 3-40

Markets in other countries have roughly similar characteristics to the U.S. markets. The trend is to move toward electronic trading and the specialist system largely unique to the U.S.

5. Trading Costs

> PPT 3-41 through PPT 3-44

The costs that may be present in trading are covered in this section. On some trades only a commission is paid. On some trades only a spread may be paid. On many trades both a commission and at least a portion of the spread are paid. This point can be made in an earlier section on PPP slides 27-28. Slides 43 and 44 provide some discussion of what a well functioning market should achieve and provide comparison data between the NYSE and NASDAQ.

6. Buying on Margin

> PPT 3-45 through PPT 3-54

Instructors may wish to tell students that buying stock on margin is not the same thing as a margin arrangement in futures. While both futures and stock trading have maintenance margins and margin calls which are similar, the costs of borrowed funds must be factored into analysis of the returns of stock margin trading. The degree of leverage available in equities is set by the Federal Reserve Board under Regulation T and is less than is typically available in futures.

The IMR or initial margin requirement is the minimum amount of equity an investor must put up to purchase equities. It is currently set at 50%. Thus 1- IMR = maximum percentage of the purchase that the investor can borrow. An investor borrows from the broker. The loan agreement is technically termed a "hypothecation agreement." Brokers also typically require a minimum <u>dollar</u> amount in a margin account such as $2,500 or $5,000 or even higher. This minimum dollar amount may result in an investor having to put up equity greater than is needed under the 50% requirement.

The amount of equity in the position will vary as the market value of the underlying stock varies. Equity in the position is calculated as the Position Value – Amount Borrowed. The maintenance margin requirement (MMR) is the minimum amount of equity that the account may have. This is typically 25% for equities. A margin call occurs if the position's equity is reduced to below the MMR. A declining stock price will reduce the investor's equity. The minimum equity that avoids a margin call occurs if the Equity/Market Value = MMR. We can find the market value at which this will occur by solving the following for market value:

(Market Value – Borrowed) / Market Value ≤ MMR;

A margin call will occur when the Market Value = Borrowed / (1- MMR)

An example is provided in PPT slides 50-54. The example also includes rate of return calculations including loan costs. Students are typically troubled by the return calculations so the instructor should take their time explaining this material.

7. Short Sales

PPT 3-55 through PPT 3-64

With the background developed in margin trading, the concept of short selling is covered next. A brief description of the mechanics of a short sale is first introduced. The instructor may wish to use slide 57 or skip it. Slide 57 compares long positions with short positions and what they are designed to accomplish.

A short seller has a liability as opposed to an asset. The liability is that the short seller must buy the stock back. Short sales involve margin requirements. The typical margin requirement is 50% but in this case margin is not an outright loan. Rather the margin is used to ensure the investor will be able to buy the stock back if its value increases. Short sale proceeds must be pledged to the broker (kept in the margin account). The investor must also post 50% of the short sale proceeds in the margin account. The equity of the short position = Total amount in the margin account – Market Value of the security shorted. Short positions also have maintenance margins. A typical maintenance margin may be 30%. As in buying on margin, a margin call may occur if the stock price rises sufficiently. The market value at which a margin call on a short sale will occur is when the Market Value = Total Margin Account / (1+MMR).

In the typical short sale the short seller sells stock by borrowing stock from the broker. Most stocks are held in 'street name.' This means that the security title remains with the broker. The broker uses its internal records to keep track of the positions of its clients and what they 'own.' A broker can then take some of its stock held in street name and sell it for the investor who wishes to engage in a short sale. The short seller is thus liable for any cash flows such as a dividend that may occur while the short sale is outstanding. A naked short sale occurs when the short seller does not have the stock. Naked short selling can lead to excessive speculation not limited by existing supply of shares. It is problematic whether naked short sales should be allowed. Traditionally exchange traded stocks could only be sold short if the last price change that occurred was positive. This is the so called zero tick, uptick rule. A short sale could be utilized if the last trade or tick was zero as long as the last time the price did change it went up. The zero tick, uptick rule was eliminated by the SEC in July 2007 but there has been discussion about reinstating the rule. During the financial crisis all short selling was banned for certain financial firms as regulators worried that excessive short selling exacerbated market declines. This worry is probably overblown. The rule change had unintended negative consequences for hedge funds who were using short strategies to limit risk of other positions.

8. Regulation of Securities Markets

PPT 3-65 through PPT 3-70

Some of the history of securities regulation is provided and the new Financial Industry Regulatory Authority or FINRA created in 2007 is mentioned. The instructor may wish to cover the Excerpts from the CFA Institute Standards of Professional Conduct found on PPT slide 68. Recent scandals have

rocked the securities markets. This is an area that has received and continues to receive enormous amounts of coverage in the press. Numerous proposals for additional regulation have appeared even before the costs and efficiency of Sarbanes-Oxley can be assessed. The changing landscape of trading arrangements and developments of new securities presents challenges in regulation. The financial crisis will lead to major changes in regulation of both banking and securities markets but as of this writing we can't really tell what form these changes will take. It is likely that a 'systemic regulator' will be created to perhaps limit the size of institutions or more likely, the extent of risks that financial institutions can undertake as well as increase oversight of derivatives. As a result financial innovation will suffer, although history shows us that the financial industry will find ways to evade regulations. It is safe to say however that government involvement in the markets is likely to increase and remain at a much higher level than in the recent past for quite some time. I believe we will also probably see some reform of ratings agencies. The top three ratings agencies (Moody's, S&P and Fitch) have been granted a government oligopoly and arguably have failed miserably in accurately rating the risk of mortgage backed securities, CDOs, etc. This isn't their first failure either. The problem may stem from how the raters are funded (they are paid by the firms they rate, creating a huge conflict of interest) and from the lack of competition. There are seven other rating agencies I believe but only the ratings of the big three are often considered as having the government's blessing. For instance as of this writing the government's TALF program will only purchase securities rated by the big three. There are several good Wall Street Journal articles the instructor may wish to peruse or assign to students to generate a general discussion of the crisis and government's role in the markets:

1. 'A Crisis of Ethic Proportions: We must Establish a 'Fiduciary Society,' by John Bogle, Wall Street Journal Online, April 20, 2009.
2. 'Good Government and Animal Spirits: Every Talented Player Understands the Importance of a Strong Referee,' by George Akerlof and Robert Shiller, Wall Street Journal Online, April 23, 2009.
3. 'How Business Schools Have Failed Business: Why Not More Education on the Responsibility of Boards?' by Michael Jacobs, Wall Street Journal Online, April 24, 2009.
4. 'In Defense of Derivatives and How to Regulate Them,' by Rene Stulz, Wall Street Journal Online, April 6, 2009.
5. 'Can Ethical Restraint Be Part of the Solution to the Financial Crisis?' by Stephen Jordan, Fellow, Caux Round Table

Each of these articles is largely non technical and should be easily understandable to an undergraduate finance student.

9. Sample Problems

> PPT 3-71 through end

Quite a few worked out problems are included in these slides.

CHAPTER FOUR
MUTUAL FUNDS AND OTHER INVESTMENT COMPANIES

CHAPTER OVERVIEW
This chapter describes the various types of investment companies and mutual funds. The chapter discusses services provided by mutual funds and describes expenses and loads associated with investment in investment companies. Investment policies of different funds are described and sources of information on investment companies are identified.

LEARNING OBJECTIVES
After studying this chapter the students should be able to identify key differences between open-end and closed-end investment companies and understand the advantages of investing in funds rather than investing directly in individual securities. Students should be able to describe the expenses associated with investment in mutual funds, calculate net asset value and fund returns and identify the major types of investment policies of mutual funds. They should be able to understand the implications of turnover on expenses and taxes and finally, students should be able to describe services provided by mutual funds and be able to identify sources of information on investment companies.

CHAPTER OUTLINE
1. Investment Companies

> PPT 4-2 through PPT 4-4

Key services provided by investment companies are include elements of services that are related to scale factors such as reducing transaction costs, diversification and divisibility. Mutual funds can trade securities at lower costs because of the size of the trades and because they are trading larger dollar volumes with brokerage firms. Services related to professional management and administration involve compensation for expertise. Investing in a fund family also infers some benefits. Advantages include professional administration of the account, record keeping to keep track of all of your investments in one location and keeping track of all of your distributions from the funds. It is also easy to reinvest any distributions. Fund investing allows for 'instant' diversification on a scale that may be difficult for small investors to do when buying securities on their own. Investors will have knowledgeable management of their portfolio so they can concentrate on their own careers. The fund managers generally have an MBA and plenty of experience trading securities. Economies of scale also allow for reduced transaction costs.

2. Types of Investment Companies

> PPT 4-5 through PPT 4-12

While the largest category of investment organization is managed investment companies, other vehicles exist. About 90% of investment company assets are held in mutual funds. For various reasons, actively managed mutual funds don't invest all the money at their disposal, but instead maintain cash balances of approximately 8%. (Source: The Fool)

A unit trust is a pool of funds invested in a portfolio that is fixed for the life of the fund. Trusts are often set up for fixed-income securities. The trust life is dependent on the maturity of the securities.

The key differences between open-end and closed-end funds are displayed in PPT 4-7. Since the shares in closed-end funds are acquired in secondary markets, prices for such shares may differ from the underlying net asset value (NAV). Closed end fund shares may trade at a premium or a discount from NAV. In an open end fund the investor buys and sells fund shares from the fund at the NAV. An investor has no liquidity concerns in an open end fund. However, the open end fund must keep a cash reserve to meet planned redemptions and may have to liquidate securities if redemptions are sufficiently higher than anticipated. This can affect fund performance. It is unclear whether closed end fund discounts represent a good deal for investors. There may be unrealized tax gains in the fund or the discounts may exist to offset lower liquidity.

Commingled funds are partnerships for investors that pool their funds. Commingled funds are commonly used in trust accounts for which investors do not have large enough pools of funds to warrant separate management. REITs (Real Estate Investment Trusts) are investment vehicles that are similar to closed-end funds. They invest in real estate (equity trust) or in loans secured by real estate (mortgage trusts). REITs employ financial leverage and offer an investor the possibility to invest in real estate with professional management.

Hedge funds pool funds of private investors. They are only open to wealthy and institutional investors. Some have initial 'lock-up' periods (minimum time before capital can be withdrawn. Hedge funds engage in short selling, risk arbitrage and other derivatives. Some may have been involved in excessive naked short selling. Naked short selling (see Chapter 3 for more detail on short sales) is short selling shares you don't have. With most stocks held in street name it may be possible to sell more stock than actually exists, exerting downward pressure on a share's price. This is far more likely to be a serious problem for smaller firms than firms with a large public float. Most hedge funds are registered as private partnerships and thus avoid SEC regulation. Secretary of Treasurer Tim Geithner has indicated that hedge funds should have increased regulatory oversight. Some are also calling for greater transparency on short positions to avoid problems with excessive short sales. Hedge funds grew from about $50 billion in 1990 to about $2 trillion in 2008.

3. Mutual Funds

> PPT 4-13 through PPT 4-29

Net Asset Value (NAV) is used as a basis for valuation of investment company shares and it may be calculated as follows:

$$NAV = \frac{Market\ Value\ of\ Fund\ Assets - Fund\ Liabilities}{Fund\ shares\ outstanding}$$

More differences between Open-End and Closed-End Funds
  Shares Outstanding
    ❖ Closed-end: no change unless new stock is offered
    ❖ Open-end: changes when new shares are sold or old shares are redeemed
  Pricing
    ❖ Open-end: Fund share price = Net Asset Value(NAV)
    ❖ Closed-end: Fund share price may trade at a premium or discount to NAV

Sample NAV calculation

ABC Fund ($Millions except NAV)

Market Value Securities	**$550.00**
+ Cash & Receivables	**75.00**
- Current Liabilities	**(20.00)**
NAV Total	**$605.00**
÷ # Fund Shares	**20.00**
NAV	**$ 30.25**

How Funds Are Sold

About half of the funds are 'Sales force distributed.' This means that brokers and planners recommend the funds to investors. These funds will typically have a front end load. A front end load is an up front cost (fee) to purchase a share of a mutual fund. Some funds may have a back end load and or a 12b-1 fee instead of or in addition to the front end load. These other charges are described below. There may also be revenue sharing on sales force distributed funds between the recommender and the fund. This creates a potential conflict of interest between the broker or planner and the investor. Other funds are directly marketed. The investor has to find them on their own. These funds should not have a front end load although they may have a back end load or even in some cases a 12b-1 charge.

Potential Conflicts of Interest: Revenue Sharing

- ❖ Brokers put investors in funds that may that may not be appropriate for the investor.
- ❖ Mutual funds could direct trading to higher cost brokers because the broker recommends their fund.
- ❖ Revenue sharing is legal but it must be disclosed to the investor.
- ❖ Revenue sharing, soft dollar commissions and other such practices should be prohibited. These practices create conflicts of interest and reduce transparency. Restoring trust with the public is even more important after the financial crisis.

Some funds are sold in financial supermarkets such as at Charles Schwab. Investors can purchase load funds from Schwab or others without paying the load. However there is no free lunch, the fund may charge higher expenses to offset. Nevertheless investors often get the benefit of low cost switching even between fund families and easier to interpret record keeping when investing this way.

Funds and Investment Objectives

(This section relies on Morningstar's definitions of fund types and the analysis relies heavily on Burton Malkeil's work in "A Random Walk Down Wall Street.") Investment funds follow policy general policy guidelines and may be roughly grouped according to the type of fund. Investors should be aware however that large differences exist between different funds within the same category. An investor should never invest in any particular fund without reading and understanding the prospectus. If one is willing to pay a load charge the investor can obtain advice from a broker or planner.

1. Domestic Stock Funds
    a. Aggressive Growth
        i. Sector, Small Cap Growth, Mid Cap Growth
    b. Growth
        i. Large Cap Growth

        c. Growth & Income
                i. Small, Medium, Large, Blend
                ii. Small, Medium, Large Value
        d. Countercyclical
                i. Bear Market

Investors in these type funds should be seeking capital gains rather than stable income. You can expect fairly high turnover and substantial potential for capital loss in any one year.   The instructor may wish to pull recent data from Morningstar on average returns in each of these categories. Small Cap is < $1 billion (Hot Topic (Ticker HOTT)), Mid Caps are $1-$5 billion, (Barnes and Noble) and Large Caps > $5 bill (GE).

2. Index funds
        a. Broad market
        b. Industry or market subset
        c. International market
        d. Size subset

The goal of these funds is duplicate the performance of an index or market sector. These funds have low turnover and low expenses. In this category bigger funds tend to be more efficient and have lower costs. These funds suit investors who believe in efficient markets and those who are looking for low expenses and turnover. This risk depends on the type chosen. Some sector funds are quite risky.

3. Balanced funds
        a. Allocation funds
                i. World, moderate, conservative
                ii. Convertibles
        b. Target date funds
                i. Near term (to 2014), Intermediate (2015-2029), Long term (2030+)
Allocation funds modify weights (asset allocations) according to manager's forecasts. These funds vary, some may be riskier and can generate higher turnovers and tax liabilities while some have an income focus and may generate more tax liability.   Convertibles invest in convertible securities. Target date funds are designed for investors who need the money during the targeted year. Typically investors reduce risk as retirement nears. They change their asset allocation and reduce the weight on stocks and particularly risky stocks. Target date funds change these allocations automatically as the target date nears. These funds suit investors who believe in efficient markets and those who are looking for low expenses and turnover. This risk depends on the type chosen. Some sector funds are quite risky.

4. Fixed Income Funds
        a. Federal Government
                i. Short, Intermediate, Long Term
                ii. Inflation Protected
        b. Corporate
                i. Ultrashort, Short, Intermediate, Long Term
                ii. High Yield, Multisector
                iii. Emerging Market

iv. Bank Loans

These funds focus on income and current yield more so than capital gains. They have a lower potential for capital loss, and inflation risk (except for a. ii.) is higher. These funds are suitable for more risk averse investors with short to intermediate time frames. These funds add diversification, income and safety to a portfolio. Investors should be aware of the potential higher tax liability involved in these funds however.

5. International Stock Funds
   a. Foreign
      i. Size and Value/Growth
   b. Global or World
      i. Size and Value/Growth
   c. Geographic region
   d. Emerging Market

Foreign funds usually exclude the U.S. and global or world funds include both foreign and U.S. investments. The risk of these funds varies but it can be high. Investors may also have indirect foreign exchange exposure as currency movements can affect the dollar returns. Expense ratios on some of these funds have also been high. Investors should be aware that some of these funds such as emerging market funds may have substantial potential for capital loss. On the positive side these funds can provide additional diversification benefits.

6. Money Market Funds
   a. Taxable
   b. Tax Exempt

Money market funds have their NAV fixed at $1.00. There are no capital gains or losses, just income distributions. These funds provide some income while maintaining safety of principal. They earn more than bank accounts with little additional risk, although two (out of thousands) have now broke the buck or failed.

Trading Scandals
Late trading allowed some investors to purchase or sell fund shares after the NAV has been determined for the day. (NAVs are established once per day at the end of trading.) Market timing is allowing investors to buy or sell on stale net asset values based on information from international markets. For example a fund NAV may be based on prices in foreign markets which close at different times. A U.S. mutual fund specializing in Japanese stocks may create an exploitable opportunity since the Japanese markets close before ours, at which time the fund's NAV will be set. If the U.S. markets subsequently go up late in the day, probably Japanese stocks will go up the next day, driving up NAV for the fund the next day. The effect of these activities is to transfer wealth from existing owners to those engaging in these activities, in effect creating a privileged fund holder class. Reforms have included a strict four P.M. cutoff to execute orders that day. Late orders must be executed the following day. Fair value pricing may also be employed where the NAV is updated based on trading in open markets. Finally, redemption fees may be imposed on short term holding periods under one week. In aggregate, funds paid more than $1.65 billion to settle these claims.

4. Costs of Investing in Mutual Fund

> PPT 4-30 through PPT 4-38

Funds with a front-end load initially reduce the investment amount. This makes the cost of a front end load higher and investors who feel comfortable picking their own funds should pick a no load fund. If the investor's choice is between a front end load or a 12b-1 fee the choice is less clear cut. A 12b-1 fee is a different way to assess a front load charge. In a front load the individual investor pays the full amount of his/her load charge. In a 12b-1 fee the load is assessed against the NAV of the fund, in effect, all investors share in paying the 12b-1 fee. The 12b-1 fee is an annual assessment that an investor must pay as long as they are invested in the fund whereas the front load is a one time fee. Hence if investors plan on holding the mutual fund for a sufficiently long time the front end load may be preferable to a 12b-1, even though the front load reduces the invested amount.

12b-1 fees are an attempt by the industry to 'hide' or at least reduce the visibility of the load. As investors have become more savvy the number of load funds has declined and average load charges have fallen. Some funds have both a front end load and a 12b-1 fee and presumably the investor has a choice which to pay. If the fund is charging both then this fund should be avoided.
A back-end load or exit fee may be charged when the shares are redeemed. It is common for an exit fee or the back-end load to become smaller with longer investment periods. This is called a holding period contingent fee.

When comparing expense ratios on funds, the 12 b-1 charges should be added to the fund expenses since the 12b-1 fees represent an annual charge. Operating expenses that are reported may not fully reflect operating costs because of soft-dollar payments. Some brokerage houses provide supposedly free services to mutual funds (including such services as research, database costs, etc.). Items purchased with the soft dollars are not reported in expense data so funds may understate actual expenses. Soft dollar payments should be prohibited by the SEC.

The research with respect to the relationship of performance and expenses indicates that funds with high expense ratios and high levels of turnover tend to be poor performers.
Several examples of the effects of expense are provided in the PowerPoint.

5. Taxation of Mutual Funds

> PPT 4-39 through PPT 4-43

Mutual funds are not taxed as long as the fund meets certain diversification requirements and the fund distributes virtually all income earned, including capital gains, (less fees and expenses) to fund shareholders. The investor is taxed on capital gain and dividend distributions at the investor's appropriate tax rate. The distribution requirements imply that portfolio turnover may affect an investor's tax liability. The fund itself pays commission costs on purchases and sales of portfolio holdings, which are charged against NAV although these commissions are lower than what you and I pay. Nevertheless, total commission expenses are higher if the portfolio has higher turnover.

The turnover rate is measured as the total value bought or sold in a year divided by the average total asset value. For example, if a fund had an average total asset value of $10 million and $6 million of securities were bought or sold that year the turnover rate was 60%.

The average security holding period can be found from the turnover ratio as follows:

Average holding period or AHP

AHP = 0.5 x (1 / turnover ratio)

AHP = 0.5 x (1 / 0.60) = 0.83 years

Turnover rates vary from under 5% to well over 300% per year.

Investor directed portfolios can take advantage of tax consequences and time when to take taxable gains, while investment in most mutual funds cannot be structured to take advantage of specific tax considerations. High turnover may lead to higher taxes and results in greater expenses for the fund.

6. Exchange Traded Funds

> PPT 4-44 through PPT 4-48

Exchange Traded Funds have become popular and offer investors alternatives to traditional mutual funds. Key aspects on ETFs are displayed in PPT 4-27. ETFs allow investors to trade portfolios of indexes as individual shares of stock. A wide variety of indexes, both international and domestic can be traded. Some advantages include lower taxes and costs as well as the ability to trade the index portfolios intra-day and to engage in margin purchases and short sales. Potential disadvantages include price deviation from NAV and payment of brokerage fees to trade the funds.

7. Mutual Fund Investment Performance: A First Look

> PPT 4-49 through PPT 4-52

The evidence on mutual fund performance does not show a consistent superior performance to broad market indexes. Evidence shows a tendency for some persistence in superior performance by funds but the evidence is far from conclusive. Mutual fund marketing literature emphasizes past performance but the evidence indicates that historical performance is not a good predictor of future performance. There is some evidence that funds with higher expense ratios are more likely to be poorer performers.

8. Information on Mutual Funds

> PPT 4-53 through PPT 4-57

A partial list of sources of information on mutual funds appears in PPT 4-54. As the popularity of mutual funds has grown in recent years, nearly all major business publications feature some reporting on performance of mutual funds. Several agencies or publications rank mutual fund performance, including Morningstar. However fund rankings which are based on historical data are not necessarily good predictors of future fund performance.

9. Choosing a Specific Fund

> PPT 4-58 through PPT 4-65

This material is NOT in the text. It draws heavily from, "A Random Walk Down Wall Street," by Burton Malkeil.

Match the fund's objective with the investor's goals and time horizon to identify the category of funds desired. Be aware that multiple funds and multiple categories may be desirable. The choice may be a function of the age of investor; younger investors can normally tolerate more risk. The investor's goal will also matter.

Decide whether to go with a load or a no load fund. If you are willing to pay a load, you can obtain advice from a broker or commission based planner about fund choice. Either you must research no load funds or can hire a fee based financial planner.

Examine the firm's 3 year, 5 year and 10 year performance, return and risk. Be aware that historical performance may not be repeated in the future. The fund's expense ratios, 12b-1 charges and any loads should be analyzed and compared with other potential fund investments.

Be leery of fund's claims about historical performance. Funds emphasize the most favorable periods and higher returns may be the result of higher risk. The performance statistics should be compared to a benchmark with similar risk. There is little evidence that funds can successfully engage in frequent major changes in asset allocation (market timing). Be aware that the fund's growth rate is largely a function of marketing expenditures rather than truly superior returns. Larger funds may have larger overhead and may have a harder time finding sufficient numbers of better investments needed to generate superior returns for fund investors.

Diversification is a great advantage of investing in mutual funds. Investing in several funds may be necessary to optimally diversify. Substantial additional diversification benefits can be achieved with the purchase of international mutual funds.

Management style and tenure: Learn the investment style of the fund and ensure it matches your own preferences (value, growth, allocation, index, etc.).

10. Sample Problems

PPT 4-66 through PPT 4-76

Nine problems are covered that the instructor may wish to go over to illustrate the chapter concepts.

CHAPTER FIVE
RISK AND RETURN: PAST AND PROLOGUE

CHAPTER OVERVIEW

This chapter introduces the concept of risk and return. To induce rational investors to accept more risk they must be promised a sufficient large enough return to overcome their risk aversion. The concept of excess returns or risk premiums is developed and Value at Risk (VaR) and the Sharpe performance measure are introduced. The primary focus of the chapter however is to calculate the expected return and risk of an individual security and to determine the return and risk of combinations of risky assets and risk free investments. The chapter also presents historical return and risk data for some asset classes. The difference between real returns and nominal returns is presented along with the Fisher effect. This chapter is a foundation chapter for understanding modern portfolio theory and the efficient frontier, topics covered in Chapter 6.

LEARNING OBJECTIVES

After covering this chapter, the student should be able to calculate ex post and ex ante risk and return statistical measures, such as holding period returns, average returns, expected returns, and standard deviations. Readers should understand the differences between time weighted and dollar weighted returns, geometric and arithmetic averages and have some idea when to use each. Students will also gain a basic understanding of returns and risk of various asset classes and understand that securities that offer higher returns have higher risk. In addition, the student should be able to construct portfolios of different risk levels, given information about risk free rates and returns on risky assets. The student should be able to calculate the expected return and standard deviation of these combinations.

Students will learn that theoretically one can easily construct portfolios of varying degrees of risk by simply altering the composition of the portfolio between risk free securities and mutual funds. In addition, the student is introduced to the concept of further increasing returns (and risk) by buying additional risky securities with borrowed funds.

CHAPTER OUTLINE
1. Rates of Return

> PPT 5-2 through PPT 5-23

The PPT begins calculating holding period returns or HPRs and discusses why we calculate returns and sometimes annualize them. Annualizing with and without compounding is illustrated. This should be a review of their basic finance course.

There are several methods for averaging returns over multiple periods. The first choice with respect to averaging is the choice of using the arithmetic or geometric average. The arithmetic average, by the nature of its calculation, assumes that at the start of each period any earnings are withdrawn and the original principal is maintained. Geometric mean calculations assume reinvestment of all gains and losses. The geometric mean will normally be lower because it is a compound return and a smaller growth rate is required for a given set of values if there is compounding. This is a common student question. The geometric mean is lower if the returns vary and the differences between the two will grow with a greater standard deviation of returns, particularly if negative returns are included in the series.

A simple example of measuring a portfolio return is next presented before we tackle the tougher problem of measuring returns through time when the amount invested may change. Time series returns may be averaged through calculating time weighted returns or via dollar weighted returns. In time weighted returns the investor is assumed to hold only 1 share of the security in each time period. The calculated returns are solely a function of the security performance over the time under evaluation. Once the return series is calculated, either a geometric or an arithmetic average may be calculated. Dollar weighted returns include the effects of the investor's choices of when they bought and sold securities. Thus dollar weighted returns give the investor a truer estimate of the rate of return they earned based on security return performance and their own choices of when they bought and sold the security.

2. Risk and Risk Premiums

> PPT 5-24 through PPT 5-39

This section begins by illustrating calculations of expected returns and standard deviation ex ante for individual securities via scenario analysis. Ex post average return and standard deviation calculations are also provided. Basic characteristics of probability distributions are then covered including definitions of mean, variance, skewness and kurtosis. For distributions that are skewed, the median and mean returns are different.   For normal distributions the mean and variance or standard deviation are sufficient statistics to characterize the distribution.

Value at Risk
Value at Risk attempts to answer the following question:
How many dollars can I expect to lose on my portfolio in a given time period at a given level of probability?
The typical probability used is 5%.
In a given probability distribution we need to know what HPR corresponds to a 5% probability.
If returns are normally distributed then we can use a standard normal table or Excel to determine how many standard deviations below the mean represents a 5% probability:
From Excel: =Norminv (0.05,0,1) = -1.64485 standard deviations. In the Norminv function in Excel the 0.05 is the 5% probability, 0 is the mean and 1 is the standard deviation of a standard normal variate.

From the standard deviation we can find the corresponding level of the portfolio return:
$VaR = E[r] + -1.64485\sigma$
For Example:
A $500,000 stock portfolio has an annual expected return of 12% and a standard deviation of 35%. What is the portfolio VaR at a 5% probability level?
$VaR = 0.12 + (-1.64485 * 0.35)$
$VaR = -45.57\%$ (rounded slightly)
$VaR\$ = \$500,000 \times -.4557 = -\$227,850$
What does this number mean?: The greatest annual expected loss 95% of the time is $227,85.

VaR is an easily understood quality control measure. Investment oversight boards can determine whether this loss is acceptable given the portfolio's goals. The VaR calculation does not require normal distributions. The text illustrates calculating VaR if you have a normal distribution. If options or other complex instruments are included in the portfolio you will not have a normal distribution. You then have to approximate the distribution or perhaps use a Monte Carlo simulation to build a distribution of future returns.

VaR versus standard deviation:
For normally distributed returns VaR is equivalent to standard deviation (although VaR is typically reported in dollars rather than in % returns). VaR adds value as a risk measure when return distributions are not normally distributed. Note the actual 5% probability level will differ from 1.68445 standard deviations from the mean due to kurtosis and skewness if these are present. In these cases the standard deviation is a not a sufficient statistic to measure risk.

Risk Premium and Risk Aversion
The risk free rate is the rate of return that can be earned with certainty. The risk premium is the difference between the expected return of a risky asset and the risk-free rate. The risk premium may be called an 'excess return.' The excess return can be depicted as:

Excess Return or Risk Premium$_{asset}$ = E[r$_{asset}$] – rf

Risk aversion is an investor's reluctance to accept risk. An investor's aversion to risk is overcome by offering investors a higher risk premium.

3. The Historical Record

PPT 5-40 through PPT 5-46

Annual Holding Period Returns Statistics 1926-2008From Table 5.3				
Series	**Geom.Mean %**	**Arith. Mean%**	**Excess Return%**	**Kurt.**	**Skew.**
World Stk	9.20	11.00	7.25	1.03	-0.16
US Lg. Stk	9.34	11.43	7.68	-0.10	-0.26
Sm. Stk	11.43	17.26	13.51	1.60	0.81
World Bnd	5.56	5.92	2.17	1.10	0.77
LT Bond	5.31	5.60	1.85	0.80	0.51

The geometric mean is the best measure of the compound historical rate of return. Nevertheless the arithmetic average is the best measure of the expected return. Notice the greater divergence of the GAR and AAR for small stocks. This is because of the high variance and the higher proportion of negative returns in the small stock portfolio. Although we don't have statistical significance it appears that some of the portfolios exhibit kurtosis. Kurtosis of the normal distribution is zero. The world stock, US small stock and world bond portfolio appear to exhibit kurtosis. This indicates a higher percentage of observations in the tails that is predicted by the normal distribution. Non-zero value of skewness are also apparent, although we can't tell if they are significant. The world stock and US large stock portfolios may exhibit negative skewness. This indicates a higher probability of extreme negative returns than is predicted in a normal distribution.

	Portfolio		
	World Stock	US Small Stock	US Large Stock
Arithmetic Average	.1100	.1726	.1143
Geometric Average	.0920	.1143	.0934
Difference	.0180	**.0483**	.0209
½ Historical Variance	.0186	**.0694**	.0214

If returns are normally distributed then the following relationship among geometric and arithmetic averages holds:

Arithmetic Average – Geometric Average = $\frac{1}{2}\sigma^2$

The comparisons above indicate that US Small Stocks may have deviations from normality and therefore VaR may be an important risk measure for this class.

Actual vs. Theoretical VaR 1926-2008

Series	Actual VaR%	VaR% if Normal
World Stk	**-21.89**	**-21.07**
US Lg. Stk	**-29.79**	**-22.92**
Sm. Stk	**-46.25**	**-44.93**
World Bnd	**-6.54**	**-8.69**
LT Bond	**-7.61**	**-7.25**

These comparisons may indicate that the U.S. Large Stock portfolio, the US small stock portfolio and the World Bond portfolio exhibit differences from normality although we should be careful with these inferences because we don't know the statistical significance of the differences.

4. Inflation and Real Rates of Return

PPT 5-46 through PPT 5-52

The concept of real versus nominal rates and the Fisher Effect are presented. The reason for needing the exact version of the Fisher Effect is given in a hidden slide with a hyperlink so that the instructor may use it or not. Note that the approximation version and the exact version of the Fisher Effect will diverge at higher rates of inflation. The effects of inflation and taxes on an investor's return are illustrated. Note that since taxes are paid out of nominal earnings you must take taxes out of the nominal return before finding the real return.

Historical Real Returns & Sharpe Ratios 1926-2008

Series	Real Returns%	Sharpe Ratio
World Stk	6.00	0.37
US Lg. Stk	6.13	0.37
Sm. Stk	8.17	0.36
World Bnd	2.46	0.24
LT Bond	2.22	0.24

Stocks have much higher real returns over long time periods. To illustrate what this implies we can calculate the following future values:

LT Bond portfolio: $1 x 1.022^{82} = $5.96; if you had invested $1 in the LT Bond portfolio for 82 years your $1 would have grown to the equivalent purchasing power of just under $6.

US Large Stock portfolio: $1 x 1.06^{82} = $118.87; if you invested $1 in the US Large Stock portfolio for 82 years your $1 would have grown to the equivalent purchasing power of just under $119.

The Sharpe ratio is a measure of the excess return per unit of standard deviation risk. It literally measures the return per unit of risk taken. Higher Sharpe ratios indicate better the performance for that asset class. Notice that the Sharpe ratios are higher for the three stock portfolios than the bonds. Thus the stocks offered a higher rate of return per unit of risk. Does that mean investors should not hold bonds? No, adding bonds to a stock portfolio will eliminate proportionally more risk than the return sacrificed and can lead to higher Sharpe ratios.

5. Asset Allocation Across Risky and Risk-Free Portfolios

PPT 5-53 through PPT 5-72

Investors can choose to hold risky and riskless assets. We may consider investments in a money market mutual fund as a proxy for the riskless investments that an investor might actually engage in. The PPT includes some calculations of weights in the risky and riskless portfolios and the weights in the complete (including the risky and riskless components) portfolio. The PPT slides then illustrate different asset allocations, i.e., different allotments or weights to the risky and the riskless components of the complete portfolio. These combinations fall on a straight line (see below) because the standard deviation of the riskless asset is zero and because the correlation between the risky and the riskless asset is zero. Hence all combinations of the risky and the riskless portfolio are linear. The line that depicts the possible allocations between the risky and the riskless portfolio is termed the Capital Allocation Line or CAL.

The CAL is useful to describe risk/return trade-offs and to illustrate how different degrees of risk aversion will affect asset allocation. Risk aversion will impact the combinations chosen by an investor. An investor with a low tolerance for risk will likely prefer to invest some funds in the risk-less asset. An investor with a high tolerance for risk may choose to use leverage. Understanding the CAL now will help students understand the modeling in the next chapter when we consider multiple risky asset combinations.

Possible Combinations
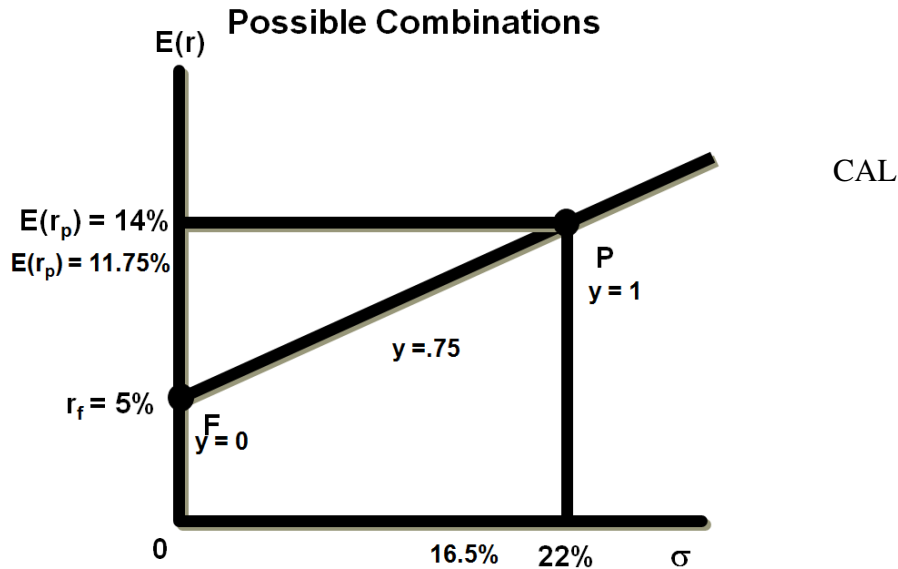
The expected return is on the vertical axis and the standard deviation of the total portfolio is on the horizontal axis. With all of your money in the risk free asset (F) you will have a 7% return and a zero standard deviation. With 100% of your money in the risky asset you will have a 15% expected return and a 22% standard deviation. Combinations (y) less than one represent varying percentages invested in the risky asset P and (1-y) the percentage invested in the risk free F. Combinations above P are possible by borrowing money at F. This is conceptually equivalent to buying stock on margin. More risk averse investors would choose a lower y and less risk averse investors would choose a larger y.

Quantifying Risk Aversion
Some efforts have been made to quantify risk aversion (A). The text assumes that the risk premium or excess return is proportional to the product of the risk aversion level A and the variance of the portfolio.

$$E(r_p) - r_f = 0.5 \times A \times \sigma_p^2$$

E(rp) = Expected return on portfolio p
rf = the risk free rate
0.5 = Scale factor
$A \times \sigma_p^2$ = Proportional risk premium
A larger A indicates that the investor requires more return to bear risk. In the asset allocation decision the optimal weight in the risky portfolio P (W_P) is:

$$W_p = \frac{E(r_P) - r_f}{A\sigma_P^2}$$

The coefficient of risk aversion A is generally thought to be between 2 and 4.
With an assumed utility function of the form:
$U = E[r] - 1/2A\sigma_p^2$

the A term can used to create indifference curves. Indifference curves describe different combinations of return and risk that provide equal utility (U) or satisfaction. Indifference curves are curvilinear because

they exhibit diminishing marginal utility of wealth. The greater the A the steeper the indifference curve and all else equal, such investors will invest less in risky assets. The smaller the A the flatter the indifference curve and all else equal, such investors will invest more in risky assets. The PPT slides contain illustrations of using indifference curves to choose the optimal asset allocation on a given CAL.

6. Passive Strategies and the Capital Market Line

PPT 5-73 through PPT 5-76

In a passive strategy the investor makes no attempt to neither find undervalued strategies nor actively switch their asset allocations. Investing in a broad stock index and a risk free investment is an example of a passive strategy. The CAL that employs the market (or an index that mimics overall market performance) is called the Capital Market Line or CML. In competitive markets active strategies that entail more information production and trading costs might not consistently perform better than passive strategies after considering those costs. As active investors trade upon their information prices will incorporate that information. This implies that passive investors are able to "free ride" upon the activities of active investors.

Excess Returns and Sharpe Ratios implied by the CML

| Time Period | Excess Return or Risk Premium | | Sharpe Ratio |
	Average	σ	
1926-2008	7.86	20.88	0.37
1926-1955	11.67	25.40	0.46
1956-1984	5.01	17.58	0.28
1985-2008	5.95	18.23	0.33

The average risk premium implied by the CML for large common stocks over the entire time period is 7.86%. However looking at the subperiod variation and the large standard deviation indicates that we cannot be very confident about using the historical data to estimate what the risk premium is likely to be in any given time period. Sharpe ratios have varied considerably as well. Notice the higher risk premium and Sharpe ratio during the time period including the Great Depression. In periods of economic uncertainty we can expect to see higher risk premiums.

7. Selected Problems

PPT 5-77 through PPT 5-83

Five problems are illustrated in the PPT.

CHAPTER SIX
EFFICIENT DIVERSIFICATION

CHAPTER OVERVIEW

In this chapter, the concept of portfolio formation moves beyond the risky and risk-free asset combinations of the previous chapter to include combinations of two or more risky assets. The concept of risk reduction via diversification created by combining securities with different return patterns is introduced. The student is introduced to analytical tools that are used to create the lowest risk portfolio that meets a target expected return. After finding the best diversified combinations the risk free asset is combined with the risky portfolio. The capital allocation line that is tangent to the so called efficient frontier of best diversified portfolios will dominate all risky portfolios, regardless of the level of risk aversion. As in Chapter 5, investors will optimally vary their asset allocation decision according to their risk tolerance by varying the amount they invest in the tangency portfolio and the amount invested in the risk free asset. See Text figure 6.6. The single factor index model is introduced; this model predicts stock returns based upon both the firm-specific and market risks of the security. Firm-specific risk may be eliminated by adding more securities to the portfolio. In a diversified portfolio, firm-specific risk is eliminated, and thus beta (systematic or market risk) becomes the relevant risk measure of the portfolio.

LEARNING OBJECTIVES

Students should be able to calculate the standard deviation and return for two security portfolios and be able to find the minimum variance combinations of two securities. Upon completion of this chapter the student should have a full understanding of systematic and firm-specific risk, and of how one can reduce the amount of firm-specific risk in the portfolio by combining securities with differing patterns of returns. The student should be able to quantify this risk-reduction concept by being able to calculate and interpret covariance and correlation coefficients. Building upon these concepts and upon the material in Chapter 5 (adding a risk-free asset to the portfolio and the reward-to-variability ratio), the student should be able to construct the optimal portfolio consisting of both risky and risk-free assets. Investors of different levels of risk aversion select varying combinations of the risky asset portfolio and the risk-free investment. Given security and market return data, the student should be able to calculate (estimate) the firm's beta, and thus determine the firm's reaction to macroeconomic (market) events. After this chapter the student should understand that firm-specific risk may be eliminated by investing in a variety of securities, and that portfolio systematic risk is a weighted average of the betas of the securities in the portfolios, where weights are the asset allocation percentages. Furthermore, if the portfolio is adequately diversified and firm-specific (or nonsystematic) risk is eliminated, then beta (or systematic risk) becomes the relevant risk measure for the portfolio.

In addition, the students should be able to construct portfolios of different risk levels, given information about risk-free rates and returns on risky assets or portfolios of risky assets. The students should be able to calculate the expected return and standard deviation of these portfolios.

CHAPTER OUTLINE

1. Diversification and Portfolio Risk
2. Asset Allocation with Two Risky Assets

PPT 6-2 through PPT 6-33

When we put stocks in a portfolio, $\sigma_p < \Sigma(W_i\sigma_i)$ Why? When Stock 1 has a return $> E[r1]$ it is likely that Stock 2 has a return $< E[r2]$ so that rp that contains stocks 1 and 2 remains close to its expected return. Covariance and correlation measure the tendency for r1 to be above expected when r2 is below expected?
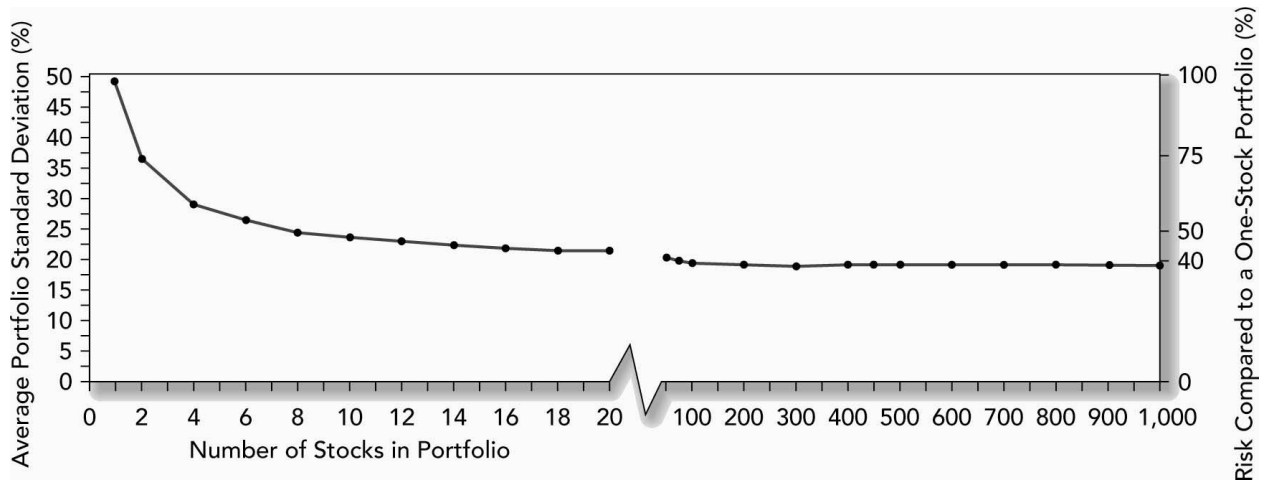

Text Figure 6.2

Text Figure 6.2 illustrates how adding securities to the portfolio reduces the portfolio risk as measured by the standard deviation. Notice how large is the standard deviation of a single stock portfolio. At about 50%, holding a single stock is extremely risky. If the stock has an expected return of 15% and a standard deviation of 50% then the investor can expect returns to be within the range of +65% and -35% two out of three years. This range is huge! These stocks were randomly selected and about 60% of the risk of an individual stock is eliminated by combining the stocks into a portfolio. With naïve diversification most of the diversification benefits are achieved at about 25 to 30 stocks in the portfolio. Modern portfolio theory, using the asset's covariances allows us to achieve even better diversification.

The PPT for this section contains formulas and examples for calculating the return and covariance, correlation and standard deviation for a two-security portfolio are presented. The effects of covariance and correlation on portfolio risk can be illustrated with the following graphs that are also in the PPT:

Assets A and B have positive standard deviations and the correlation between A and B is +1. Thus, the standard deviation of Portfolio AB is a simple weighted average of
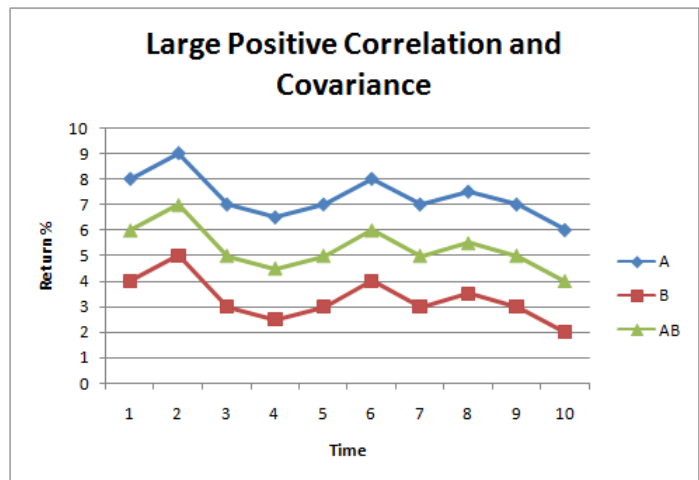
the standard deviations of A and B and no risk is reduced by combining the two.

Assets C and D have positive standard deviations and the correlation between C and D is -1. In this case the standard deviation of Portfolio CD is much less than a simple weighted average of the standard deviations of C and D and in this specific case CD has no risk. All of the risk has been averaged or diversified away.

Return and Risk of a Two Asset Portfolio

The expected return of a portfolio is simply a weighted average of the returns of the portfolio components.   Because of the diversification effects however, the standard deviation of the portfolio is not a simple weighted average of standard deviations of the components. The relevant formulas are as follows:

Large Negative Correlation and Covariance
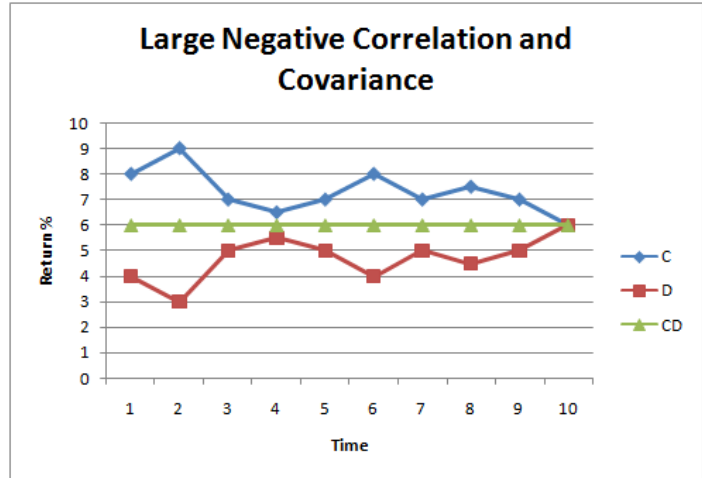
$$E(\bar{r}_p) = \sum_{i=1}^{n} W_i \bar{r}_i; \quad n = \# \text{ securities in the portfolio} \qquad \sum_{i=1}^{n} W_i = 1$$

$$\sigma_p^2 = \sum_{I=1}^{n} \sum_{J=1}^{n} [W_I W_J Cov(r_I, r_J)]$$

$W_I, W_J = $ Percentage of the total portfolio invested in stock I and J respectively

$n = $ The total number of stocks in the portfolio

$Cov(r_I, r_J) = $ Covariance of the returns of Stock I and Stock J

If $I = J$ then $Cov(r_I, r_J) = \sigma_I^2$ & $Cov(r_I, r_J) = Cov(r_J, r_I)$

For the two asset portfolio:

$$\sigma_p^2 = W_1^2 \sigma_1^2 + 2W_1 W_2 Cov(r_1, r_2) + W_2^2 \sigma_2^2$$

$\sigma_1^2 = $ Variance of Security 1
$\sigma_2^2 = $ Variance of Security 2
$Cov(r_1 r_2) = $ Covariance of returns for Security 1 and Security 2

The PPT provides ample detail about the correlation coefficient and about why correlations are easier to interpret than covariance. This detail can be skipped if your students are reasonably proficient in statistics.

Note that for an n security portfolio the portfolio standard deviation calculation will be comprised of n variances but n(n-1) covariances. As you add more securities to the portfolio the covariance terms dominate the risk calculation and the individual security standard deviations matter less.
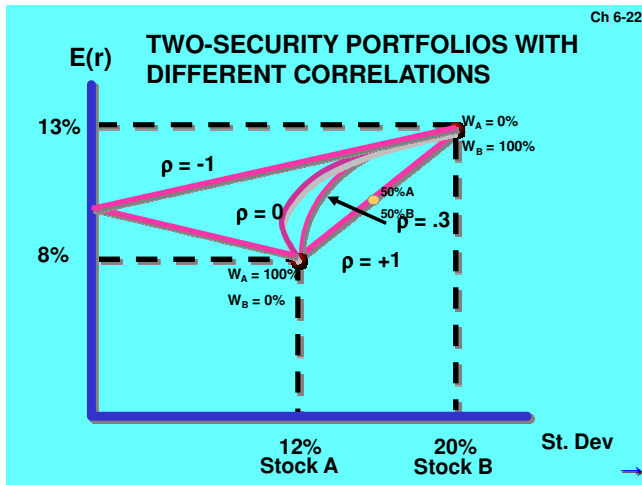
The graph depicts return risk combinations of two securities, A and B for different hypothetical correlation coefficients. If there is a perfect positive correlation between A and B, combining the two securities yields no diversification benefits and combinations of A and B fall on a straight line because in this case $\sigma_p = \Sigma W_i \sigma_i$. However if the assets are perfectly negatively correlated we can combine the two securities to completely eliminate variance in the combined portfolio. Generally asset correlations will be between -1 and +1 and the combinations can eliminate some risk but not completely remove it. It is critical that students understand that diversification will improve the Sharpe ratio, this is why people diversify.

In the two asset case it is fairly easy to calculate the minimum variance weight with the following equations:

$$W_1 = \frac{\sigma_2^2 - Cov(r_1 r_2)}{\sigma_1^2 + \sigma_2^2 - 2Cov(r_1 r_2)}$$
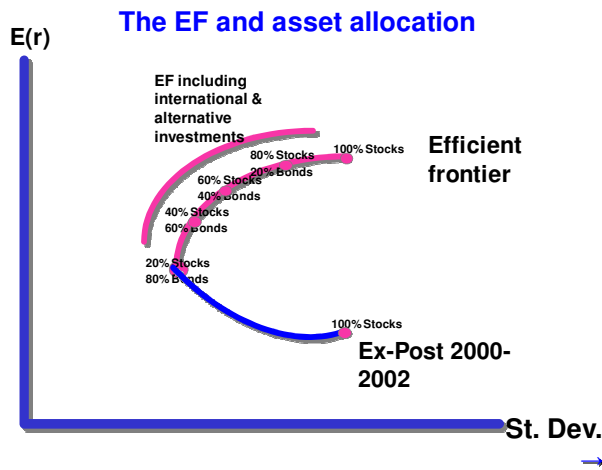
$$W_2 = (1 - W_1)$$

Once the weights are known the minimum variance portfolio expected return and risk can be calculated.
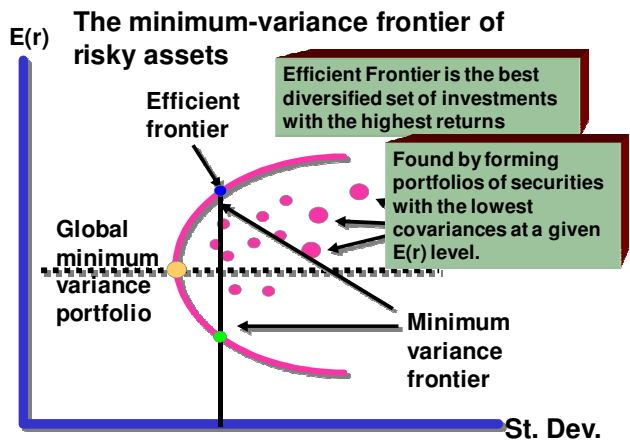
From this point in the development it is an easy step to illustrate the minimum variance set and the efficient frontier for large numbers of securities. Considering many risky asset combinations and always keeping the combinations that have the least risk for a given return level one can build a minimum variance frontier. In actuality however we are only concerned with the upper portion of the curve. Any minimum variance point on the bottom of the curve can be dominated by the similar point on the upper portion of the curve. The curve

from the global minimum variance portfolio up and to the right represents the efficient frontier, which are the best diversified combinations or the least risky for each possible expected return level.

The EF and asset allocation

E(r)

EF including
international &
alternative
investments

80% Stocks
20% Bonds   100% Stocks   **Efficient
60% Stocks   frontier**
40% Bonds
40% Stocks
60% Bonds

20% Stocks
80% Bonds

100% Stocks

**Ex-Post 2000-
2002**

St. Dev.

This graph is a very important tool to illustrate to students the real world applicability of the efficient frontier. The numbers provided are hypothetical but the idea is drawn from an account executive that came into my class and illustrated how he sets up portfolios for clients. Note that alternative investments include items such as REITs, mortgage backed securities, gold, other precious metals, & other commodities.
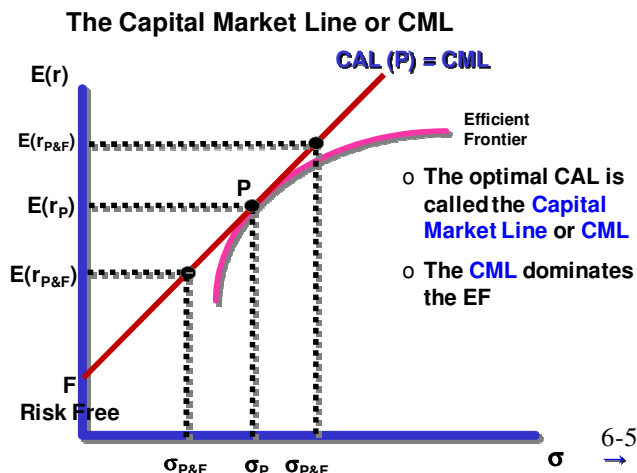
The text also illustrates the benefits of diversification by using historical data to examine the effects of including stocks and bonds in the portfolio in some of the extreme loss years. The overall standard deviation of the diversified portfolio that includes bonds is smaller than the standard deviation of either stocks or bonds individually. Thus, combinations that include bonds are likely to have higher Sharpe ratios, that is, more return per unit of risk. Combinations that provide more return per unit of risk are superior regardless of anyone's risk tolerance because of the **principle of separation**. The separation property is the idea that portfolio choice can be separated into two independent tasks: (1) determination of the optimal risky portfolio and (2) the personal choice of the best mix of the risky portfolio and the risk free asset. This is a crucial point. It means that a widow (with high risk aversion) and a 'yuppie' (a young upwardly mobile professional with low risk aversion) should both choose the same risky portfolio. Their asset allocations in their complete portfolios would differ however with the widow choosing to put a higher percentage of her money in the risk free asset than the yuppie. The PPT illustrates the separation property with indifference curves.

3. The Optimal Risky Portfolio with a Risk-Free Asset
4. Efficient Diversification with Many Risky Assets

PPT 6-34 through PPT 6-40

The Capital Market Line or CML

E(r)

CAL (P) = CML

**Efficient
Frontier**

E(r$_{P\&F}$)

P   o **The optimal CAL is
                       called the Capital
E(r$_P$)   Market Line or CML**

E(r$_{P\&F}$)   o **The CML dominates
                       the EF**

F
Risk Free

σ$_{P\&F}$ σ$_P$ σ$_{P\&F}$ σ

6-5

The extension to include a risk-free asset results in a single combination of stock and bonds that is optimal when that portfolio is combined with the risk-free asset. As explained in Chapter 5 the resulting capital allocation line is now linear. This is because the covariance between the risk free asset and the risky portfolio is zero.

At this point the Capital Market Line or CML can be developed as the optimal CAL that results from combining the risk

free asset with the efficient frontier as depicted below:

CAL(P) = Capital Market Line or CML dominates other lines because it has the largest slope or equivalently, the largest Sharpe ratio

$$\text{Slope} = (E(r_p) - rf) / \sigma_p$$

That is, the CML maximizes the slope or the return per unit of risk or it equivalently maximizes the Sharpe ratio. Regardless of risk preferences some combinations of P & F will dominate all other combinations. All investors' complete portfolio will fall on the CML.

The Capital Market Line or CML
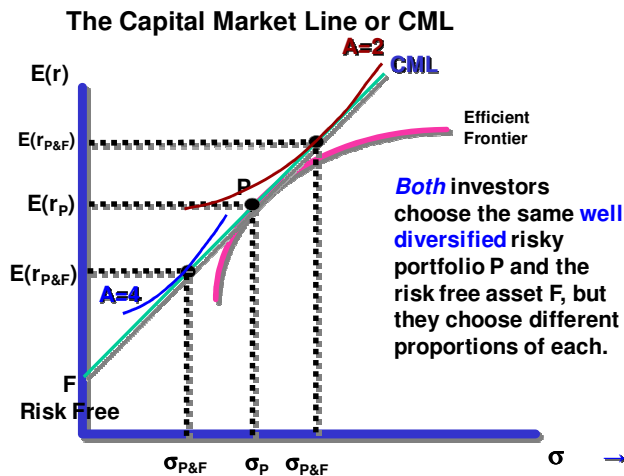
In this graph we have two investors with different levels of risk aversion. The A coefficient of 4 indicates a high level of risk aversion and a steeper indifference curve. A steep indifference curve indicates a high level of additional return required by the individual investor to bear risk. The slope of the indifference curve is the marginal rate of substitution (MRS). The slope of the CML is the marginal rate of transformation (MRT). The optimal complete portfolio is found on the CML where the MRS = MRT.

Practical Implications

The analyst or planner should identify what they believe will be the best performing well diversified portfolio, call it P. P may include funds, stocks, bonds, international and other alternative investments. This portfolio will serve as the starting point for all their clients. The planner will then change the asset allocation between the risky portfolio and "near cash" investments according to the risk tolerance of client. The risky portfolio P may have to be adjusted for individual clients for tax and liquidity concerns if relevant and for the client's opinions.
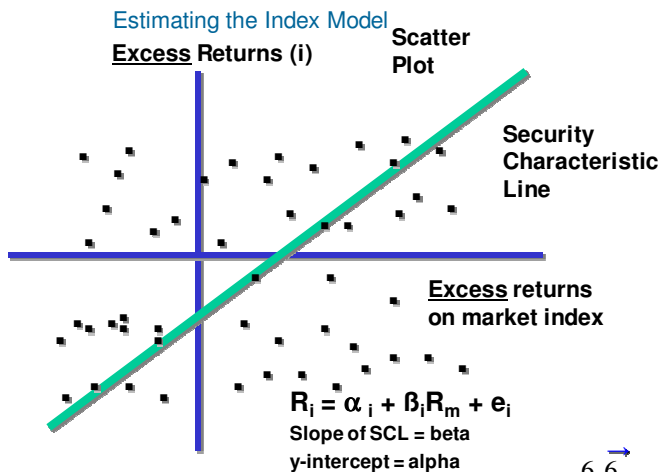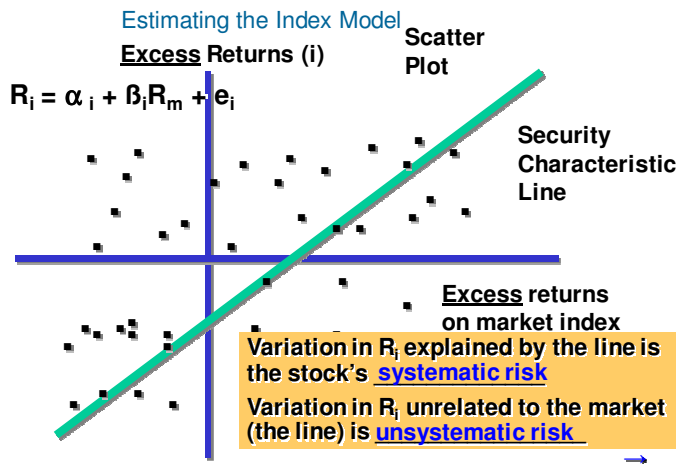

5. A Single Index Asset Market

PPT 6-41 through PPT 6-62

We have learned that investors should diversify, thus individual securities will be held in a portfolio.

The risk that cannot be diversified away, i.e., the risk that remains when the stock is put into a portfolio is called systematic risk. Systematic risk is also called non-diversifiable risk. It is the risk that cannot be averaged away when put into a portfolio.

Systematic risk arises from events that effect the entire economy such as a change in interest rates or GDP or a financial crisis such as occurred in 2007and 2008. If a well diversified portfolio has no unsystematic risk then any risk that remains must be systematic. That is, the variation in returns of a well diversified portfolio must be due to changes in systematic factors. We have already learned that the predominant statistic in determining the risk of a portfolio is the covariance. Similarly, the systematic risk of an individual stock is a function of the covariance of the stock and the well diversified portfolio.

Estimating the Index Model
Excess Returns (i) Scatter Plot

$R_i = \alpha_i + \beta_i R_m + e_i$

Security Characteristic Line

Excess returns on market index

Variation in R_i explained by the line is the stock's **systematic risk**

Variation in R_i unrelated to the market (the line) is **unsystematic risk**

The single factor model of excess returns can be used to estimate a security's beta. Each point would represent a sample pair of excess returns observed for a particular holding period. A regression analysis will find the "best fit" line to fit the data. The expected return for the security when the market has zero excess return is the point where the line crosses the vertical axis and is referred to as alpha. Beta is the slope of the regression line. A higher beta means higher systematic risk. Betas above 1 are riskier than the market since a regression of the market excess returns versus market excess returns would by definition yield a beta of 1. The scatter plot can also be used to illustrate systematic and unsystematic risk. The risk related to the systematic or macroeconomic factor, in this case the market index. A stock's total risk as measured by its standard deviation can be partitioned into systematic and unsystematic risk.

Measuring Components of Risk

$\sigma_i^2 = \beta_i^2 \sigma_m^2 + \sigma^2(e_i)$
   where;

σ_i^2 = total variance

$\beta_i^2 \sigma_m^2$ = systematic variance

$\sigma^2(e_i)$ = unsystematic variance

The advantages offered by the single index model are described in the PPT. Since the relationship of each security is compared or related to the common index, data requirements are much smaller than they would be if each pair-wise correlation was measured. Betas also provide an easy reference point since the market beta is 1.

7. Selected Problems

> PPT 6-68 through PPT 6-80

CHAPTER SEVEN
CAPITAL ASSET PRICING AND ARBITRAGE PRICING THEORY

CHAPTER OVERVIEW

This chapter first presents the capital asset pricing model (CAPM), an equilibrium pricing model derived from a set of fairly restrictive assumptions delineated in the PPT. This model was instrumental in the development of modern finance theory and several of its developers won the Nobel Prize for Economics. The essential feature of the CAPM is that the portfolio tangent to the Capital Market Line (CML) is the market portfolio of all risky assets. The chapter also presents an empirical model, the well known Fama-French 3 factor model. Finally, the chapter discusses the arbitrage pricing theory (APT).

LEARNING OBJECTIVES

After studying this chapter, the student should understand the concept and usage of the capital asset pricing model (CAPM). Similarly the reader should to be able to construct and use the security market line. The student should also have a basic understanding of index models and the Fama-French model. Readers should also understand the arbitrage pricing theory (APT) and to be able to use this theory to identify mispriced securities. The student should also understand the similarities and differences between the two main theories and the limitations of each.

CHAPTER OUTLINE
1. The Capital Asset Pricing Model

> PPT 7-2 through PPT 7-18

The introduction of the CAPM starts with an overview of the importance of the model and the assumptions that underlie it. The implications or conditions that will result from the CAPM are provided. Once the major implications and conditions have been discussed, the Capital Market Line can be examined. In discussing the CML, it is important to stress that any complete portfolio on the CML will dominate all portfolios on the efficient frontier (other than the tangency portfolio). The resulting conclusion is that investors, regardless of their risk preferences, will combine the market portfolio with the risk free investment. Since the equilibrium conditions result in all investors holding the same portfolio of risky investments, pricing of individual securities is related to the risk that individual securities have when they are included in the market portfolio. The relevant measure of risk is the covariance of returns on the individual securities with the market portfolio. The Security Market Line (SML) graphically depicts the market price of risk. The beta for the individual security is the [Cov (r_i, r_m)]/Var r_m. The beta is the measure of the amount of systematic risk a stock has, or equivalently the amount of risk a stock will have when it is put into a well diversified portfolio. Thus, the product of the market wide price of risk $(r_m - rf) / \beta_m$ times β_i is thus the premium for bearing risk and the required return for a security that compensates for its systematic risk is risk premium described above plus the risk free rate. The SML can also be used to illustrate a security's alpha. Several examples are provided in the PPT. Portfolio betas are simple weighted averages of the component security betas and are easy to calculate.

2. The CAPM and Index Models

> PPT 7-19 through PPT 7-22

Development of an index model and an example security characteristic line (SCL) are provided. Using regression analysis and the risk premiums for individual stocks, the slope of the relationship is the beta for an individual stock.

In the PPT a sample calculation of an index model using an example of GM is presented. The concept of adjusted betas is also presented. The depth in which you choose to cover this topic should depend on the background of your students. You may wish to spend some time in class developing confidence intervals and discussing the notion of statistical significance. The significance of the alpha and beta measures is an important item to be discussed in class if the student's preparation in statistics is adequate.

3. CAPM and the Real World

> PPT 7-23 through PPT 7-26

This brief section gives some background about some of the main conclusions that can be drawn from studies of the real world applicability of the CAPM. Although the model cannot be directly tested (remember Roll's critique) the practicality of the CAPM as it used can and has been extensively tested. The main conclusion of these tests is that there may be better measures of the risk premium than the estimates we use following the CAPM. This is the motivation for the Fama-French model described in the next section. As an aside, we can conclude that the CAPM is false based on the validity of its assumptions. Nevertheless the concepts from the CAPM remain valid and very important. In particular, investors should diversify, only systematic risk matters, and a well diversified portfolio can be suitable to a wide range of investors with different risk tolerances. A broker or planner will still wish to identify the best performing set of risky investments, chosen for maximum diversification at a target return level and this portfolio will be optimal for investors with different risk tolerances. Risk tolerances are adjusted for by the asset allocation decision. Some people tend to equate the idea of efficient markets with the CAPM. We have to be careful with this linkage however. If the CAPM assumptions and results were completely valid then the markets would have to be defacto informationally efficient. However if the CAPM is false this only says that our model of expected returns is wrong and it technically says nothing about information efficiency.

4. Multifactor Models and the CAPM

> PPT 7-27 through PPT 7-31

The aforementioned limitations of the CAPM theory eventually led to the development of multifactor models and the arbitrage pricing theory. These models either downplay or eliminate the central role of the market portfolio, which is unobservable anyway. The Fama-French (FF) three factor model has become a standard in equity analysis. The FF model was developed because the researchers found that stocks of smaller firms and of firms with a high book to market ratio had higher stock returns than predicted by single factor models. An example calculation of the FF model for GM is presented in the PPT and the instructor can compare the results with the single index model in prior slides. At the risk of sounding heretical, I must note that the FF model is based on empirical regularities that are apparently longstanding in the data. Nevertheless it is a model without a sound theoretical underpinning. This raises questions about whether the priced factors will remain significant in the future.

5. Factor Models and the Arbitrage Pricing Theory

PPT 7-32 through PPT 7-37

After laying the conceptual groundwork and defining terms the concept of arbitrage pricing for well diversified portfolios is presented in the PPT via some simple examples. Arbitrage opportunities exist if an investor can construct a zero investment portfolio with a sure profit. If such opportunities exist, an investor can take large positions to secure riskless profits. In efficient markets if profitable arbitrage opportunities exist traders will take positions to secure the riskless profit and we should expect such opportunities to disappear quite quickly. The PPT also covers some of the most significant difference between the APT and the CAPM and some practical difficulties in using the APT.

6. Selected Problems

PPT 7-38 through PPT 7-56

Sixteen worked out problems are presented in the PPT.

CHAPTER EIGHT
THE EFFICIENT MARKET HYPOTHESIS

CHAPTER OVERVIEW
This chapter examines the concept of market efficiency. We are asking whether securities are on average fairly priced according to the benefits they give an investor. If they are then one cannot expect to consistently earn more than you should for the risk level you are taking. In other words you cannot consistently beat the market's risk-adjusted return. There are two aspects of efficiency although the text does not explicitly separate the two.   In an informationally efficient market, price changes are unpredictable. It is this aspect of efficiency that the text is concerned with. However we may also ask a related question, "Are the markets efficient allocators of capital?" In other words do market prices accurately reflect the current worth of risk adjusted expected future cash flows? If they do then the markets are allocationally efficient.   Markets could be allocationally inefficient, but still be informationally efficient. This may arise due to behavioral problems discussed in Chapter 9 or due to structural market problems. We will have more to say on this later.

LEARNING OBJECTIVES
After studying this chapter, the student should thoroughly understand the concept of informational market efficiency and how to make rational investment decisions based upon the existence of market efficiency. The student also should have a working knowledge of some of the many tests of market efficiency, the forms of market efficiency, and observed market anomalies. Market efficiency is akin to the perfect competition model to which it is related. Like perfect competition, it should be interpreted as an ideal that markets move toward but probably will never totally achieve at all times. Nevertheless the financial markets are highly competitive and it is likely that markets will closely approach efficiency, the occasional bubbles notwithstanding. Bubbles remind us that math and models of cash flows, etc., do not drive financial asset prices, but rather, people do. The most telling lesson of this chapter is not that you can never find a great buy, but rather if you find a great buy, you should grab it quickly and don't expect to find very many such buys in the competitive markets we have.

CHAPTER OUTLINE
1. Random Walks and the Efficient Market Hypothesis

> PPT 8-2 through PPT 8-14

Definitions of informational and allocational efficiency are provided. Implications of efficiency are then discussed and the idea of random walk is introduced and illustrated. Note that we actually expect there to be a positive trend in stock prices albeit with random movements about those positive trends. The reason that we would expect to see price changes that are random is related to efficiency. If information that has importance for stock values arrives or occurs in a random fashion, price changes will occur randomly. If the market is efficient in its analysis, the change in prices will reflect that information in a timely basis. The result will be random price changes. The concept of market efficiency is related to the concept of competition. In efficient markets, once information becomes available, participants will trade quickly on that information. Competition assures that prices will reflect that information very quickly. If the information does not become incorporated into price very quickly, market participants would act to eliminate the inefficiency. Questions arise about efficiency due to possible unequal access to information, structural market problems and the psychology of investors (Behavioralism). Structural

market problems refers to market imperfections such as transaction costs limiting arbitrage, constraints on short sales doing the same and recognizing that in volatile markets, most arbitrage strategies are really risky arbitrage, not riskless arbitrage. We will have more to say on this later.

The forms of the efficient market are presented. In a weak form efficient market, prices will reflect all information that can be derived from trading data such as prices and volumes. In a semi-strong form market prices will reflect all publicly available information regarding the firm's prospects. In a strong form market, prices would reflect all information relevant to the firms' prospects, even inside information. It is important that students understand the following Venn diagram.
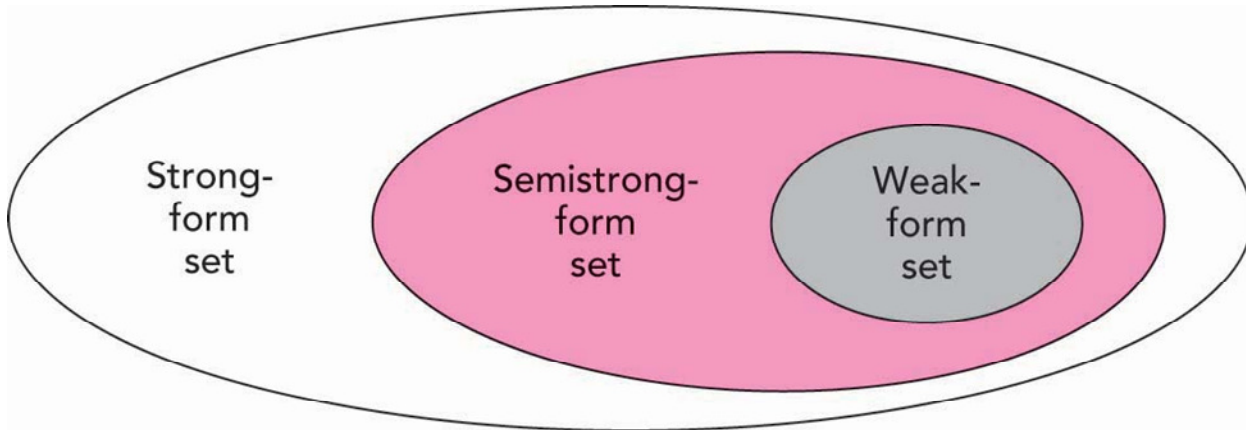
Many students struggle with this concept so it is worth taking the time to point out the relationships among the different forms of efficiency.

2. Implications of the EMH (for Security Analysis)

PPT 8-15 through PPT 8-25

Technical and fundamental analyses are defined in this section as well as the implications of the different forms of market efficiency with respect to security analysis. If markets are weak form efficient, technical analysis, such as charting, should not result in superior profits. If markets are semi-strong form efficient, fundamental analysis should not result in consistent superior profits. Fundamental analysis involves using information on the economy as well as information such as earning trends and profit trends to find undervalued securities. If markets are at least semi-strong efficient, investors would tend to employ passive strategies such as buying indexed funds or employing a diversified buy and hold strategy. Active management such as security analysis or attempting to time the market would not result in consistently superior profits if markets are efficient.

Even when markets are efficient portfolio management is required. For one thing, the appropriate risk level will vary over an investor's life. Tax considerations will call for different types of securities to be included in the portfolio. Other considerations could be related to reinvestment risk associated with cash flow or considerations related to diversifying employment related risk.

3. Are Markets Efficient?

PPT 8-26 through PPT 8-46

Over time stock prices tend to follow a submartingale. This has nothing to do with efficiency, per se. It does however have serious implications for tests of efficiency. This implies that a randomly chosen portfolio of stocks can be expected to have a positive return. In practice this means that when trying to figure out if some portfolio manager is earning abnormal returns we must compare their performance to the performance of a randomly chosen portfolio. That is they must outperform the random portfolio or in practice they must beat some benchmark rate of return. The PPT illustrates the idea of an event study and how an event study might look in an efficient and in an inefficient market and introduces a market model to provide the expected return that is needed to assess whether the investor earns an abnormal return. The magnitude, selection bias and lucky event issues are also covered as well as possible model misspecification. Because a model of expected return is needed to assess whether an investor or an investment rule earns excess return, tests of market efficiency are joint tests of the model used to estimate expected returns and market efficiency. Hence, even when an anomaly is discovered we have to be careful in interpreting the results. Some apparent anomalies are discussed including the Fama-French results, the Keim and Stambaugh findings and the Campbell and Shiller work. Note that each of these results may also be consistent with changing risk premiums and may have nothing to say about market efficiency.

Periodically stock prices appear to undergo a 'speculative bubble.' A speculative bubble is said to occur if prices do not equal the intrinsic value of the security. Does this imply that markets are not efficient? There is no definitive answer to this question. However we can make some observations:
- It is very difficult to predict if you are in a bubble and when the bubble will burst. I have been through two bubbles now and you can't understate the significance of this point.
- Stock prices are estimates of future economic performance of the firm and these estimates can change rapidly.
- Risk premiums can change rapidly and dramatically.

Nevertheless, with hindsight there appear to be times when stock prices decouple from intrinsic or fundamental value, sometimes for years. What does this imply?
- Prices eventually conform once more to intrinsic value. Many who don't believe in efficient markets anyway have jumped on this result to pronounce the death of market efficiency. However, the bubbles bring into question the allocational efficiency of the markets more than the informational efficiency. Very few people will be able to consistently predict the extent and duration of a bubble.
- Some claim the bubbles imply that investors are irrational. Perhaps, but think about what determines the price of gold. Is it irrational to buy an asset for more than its fundamental value if you believe that you can sell it for more than you paid for it? It is indeed risky to engage in this type transaction, but is it irrational?
- Bubbles seem to occur during two periods: 1) when technology is changing rapidly and 2) during periods of cheap capital when interest rates are low for extended periods. In the first case values will be more heavily determined by future growth prospects rather than the value of assets in place. During periods of cheap capital, new investments will be undertaken based on future growth prospects as well. In both situations, new investors with less investment knowledge and experience are likely to enter the markets, making a bubble even more likely. When the bubble bursts, there will appear to be a return to hardnosed rationality as investors look carefully to invest according to their beliefs about fundamental values and will employ higher risk premiums. For more on thoughts on this topic (and more history about bubbles) read Burton Malkeil's

book, "A Random Walk Down Wall Street" to learn how 'Castles in the Air' sometimes outweigh fundamental values in price setting.

Some of the major types of tests that researchers have done on market efficiency are described. If markets are inefficient, then professionals who spend considerable resources in investment should secure superior performance. The tests are broken down in terms tests of the forms of efficiency. Tests have uncovered some inefficiency in pricing but many possible interpretations of results are possible. Tests of weak-form efficiency show small magnitudes of positive correlation for very short term tests; hence prices do not strictly conform to a random walk. Studies of returns for periods of 3 to 12 months offer evidence of positive momentum. Longer horizon tests have uncovered some pronounced negative correlation. Tests do document tendencies for long term reversals in results. This may be because of information flow in competitive markets. People rush to buy recent winners and in so doing drive up the price enough so that future returns are not abnormal. This does not imply inefficiency unless the same investors can consistently do this. Attempting to interpret the results of test of efficiency has led to various explanations that arrange from model misspecification to data mining.

4. Mutual Fund and Analyst Performance

PPT 8-47 through PPT 8-58

Some recent studies on mutual funds have documented some persistence in positive and negative performance. Some researchers question whether the performance is abnormal or whether the studies have measurement errors or model biases. The overall test results are mixed at best but the evidence shows that some superstars exist. Note that Warren Buffet's portfolio, (Buffet is one of the postulated superstars) took quite a beating in the financial crisis of 2008. Although the evidence isn't conclusive it appears safe to state that the ability to consistently earn abnormal returns greater than one should for the risk level undertaken is very rare.

I also include a wrap up summary in this section to drive home the main points of the chapter. I did this because students seem to have some trouble with the implications of market efficiency and because in some cases it is difficult to get them past their own prior beliefs in spite of what the evidence reveals.

5. Selected Problems

PPT 8-59 through PPT 8-71

Ten problems are worked out and included in the PPT.

CHAPTER NINE
BEHAVIORAL FINANCE AND TECHNICAL ANALYSIS

CHAPTER OVERVIEW
The chapter describes the developing area of behavioral finance and describes some of the types of behavior that may lead to price movements being predictable. Technical analysis (TA) may be useful in an environment that features some of the behavior patterns presented in behavioral finance, although most of the tests of technical analysis have not demonstrated that TA has value. The origin, with the Dow Theory, of technical analysis is presented and charting is explained. Various other types of technical indicators are presented.

LEARNING OBJECTIVES
After studying this chapter, the student should be cognizant of typical analytical errors related to behavioralism or psychology. The student should also understand some of the basic technical indicators presented in this chapter. The student should also understand the theoretical problems of technical analysis in competitive markets that approach efficiency.

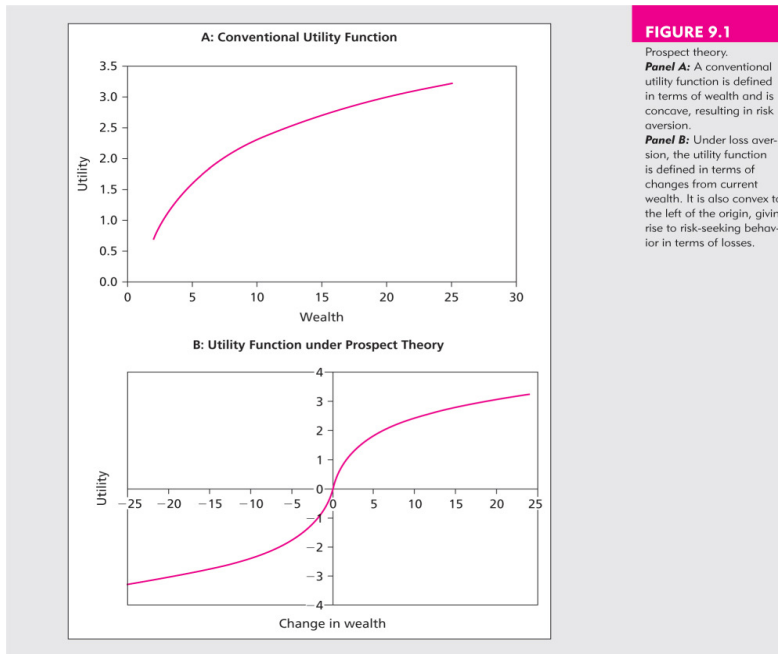## CHAPTER OUTLINE
1. The Behavioral Critique

> PPT 9-2 through PPT 9-13

The area of behavioral finance is relatively new but has been growing in popularity. The behavioralists offer explanations of asset pricing that may perhaps explain some of the observed anomalies in efficient markets although other explanations are possible. The purpose of behavioral finance is to improve decision making under uncertainty by considering information processing errors that can lead investors to misestimate true probabilities of possible events or rates or return. Various commonly posited examples are explained in the PPT. Psychologists also believe that individuals would tend to make less-than-fully rational decisions even if they used perfect information processing. The impetus for the growth of behavioral research has been the dot-com and the housing bubbles. Whether behavioralism will remain as popular in today's environment remains to be seen. I have considered many of the behavioral studies and they are very close to data mining so I remain somewhat skeptical about the empirical results although it seems very likely that the behaviors described do actually occur. Extrapolation bias and overconfidence can occur if an analyst or investor places too much confidence in historical statistical behavior. For instance believing that earnings will continue to rise simply because they have for the last eight quarters will lead to underestimating volatility and overestimating value. Some of these problems have arisen because of an overreliance on historical data in general in making forward estimates and also an overweighting of recent results. Future performance will be strongly affected if not determined by future economic events, not historical results. Using the historical data as the main basis for a forecast is tantamount to using the data as a technical trading rule. Like many technical rules it will work for a time, until it stops working because the underlying economic fundamentals change. Anchoring bias, or conservatism, as the text calls it is a similar phenomenon. The PPT refers to framing errors. This term refers to a person's tendency make a different decision with same set of facts if they are framed differently. Regret avoidance and loss aversion are examples of framing decisions. Some individuals tend to increase risk if they believe they are facing a loss anyway in an attempt to avoid the loss. They

may choose to do this even if the risk is not a fair gamble. This is not 'rational' for a risk averse investor. It is not clear to me however why this problem could not be overcome by training and experience.

Standard utility (satisfaction) theory versus prospect theory
In standard utility theory of investments investors desire more wealth and less risk. Wealth provides diminishing marginal utility, thus a gain of $1,000 provides less utility than the utility loss from losing $1,000. This gives rise to risk aversion. Prospect theory is an alternative behavioral based theory that asserts that investor utility depends on the change in wealth from the start of the investment rather than on the starting level of wealth.

FIGURE 9.1
Prospect theory.
Panel A: A conventional utility function is defined in terms of wealth and is concave, resulting in risk aversion.
Panel B: Under loss aversion, the utility function is defined in terms of changes from current wealth. It is also convex to the left of the origin, giving rise to risk-seeking behavior in terms of losses.

Prospect theory is an example of loss aversion. To the right of zero the investor acts like a typical risk averse investor with diminishing marginal utility as the increase in wealth becomes larger. To the left of zero in Panel B an investor is "in the domain of losses" and their behavior may change and they may become risk seeking. In other words, if you think you are going to take a loss, you are more likely to take a risk in hopes of avoiding the loss, even if it is not a good gamble. I have conducted a test in class that demonstrates some people do exhibit loss aversion. This may explain why people are reluctant to sell losers in their portfolio, holding on to them during periods of declining performance.

- A typical response to behavioralism is that in competitive markets if some are letting behavioral biases affect prices, why don't other better trained investors engage in profitable arbitrage? I think this is probably part of the reason for the growth in hedge funds. There are some restrictions to arbitrage activity however that are covered in the PPT. One of them is illustrated below:
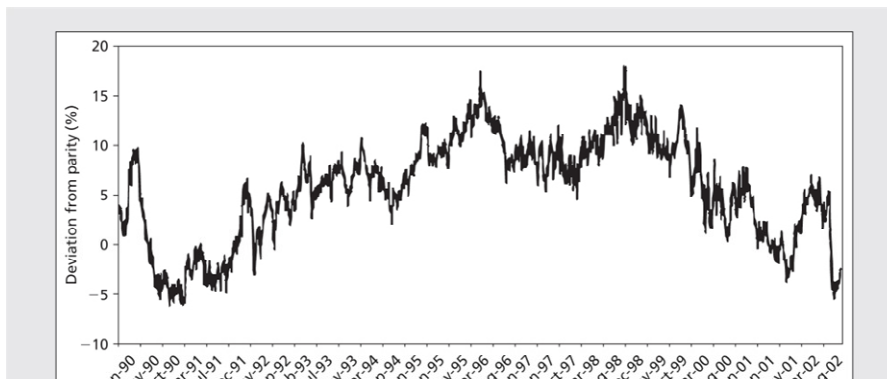
60:40 split of profits from merger between RD and Shell
Stock price ratio RD/Shell should = 60/40 = 1.5
If RD/Shell > 1.5 then short RD and buy Shell
If you had done this in 1993, you would have LOST money until 1999.

In 1907 Royal Dutch Petroleum merged with Shell Transport, although their stock continued to trade separately. Under the merger agreement RD receives 60% of the profits of the joint company and ST receives 40%. Hence the ratio of the share price of RD/ST should be 60/40 or 1.5. The price has deviated from this parity level for extended periods of time. You can find similar evidence in equity carve outs and perhaps in closed end fund discounts and premiums, although both of these may have other explanations. Remember Keynes' quote, "Markets can remain irrational longer than you can remain solvent." What if prices don't conform to your models in the near term? This can be disastrous if you are levered. Ultimately this is why Long Term Capital Management Hedge Fund failed. In the long run their bets were correct, but the markets did not return to 'normal' levels immediately and the fund's huge amount of leverage forced it under.

Behavioralism provides stories designed to fit individual situations, but there is no coherent theory of behavior and some behaviors contradict others. Much of the empirical support for these ideas comes from the dot-com bubble and perhaps the housing bubble. I would argue that behavioralism has more to say about allocational efficiency than informational efficiency but authors in this area don't seem to grasp this point and some appear to start with the prior assumption that markets are not efficient. The behavioralism literature also does not provide solutions to the stated behavioral problems. It seems to me that most of the behavioral problems stem from a lack of training in economics. Many of them derive from overreliance on historical or statistical data rather than understanding the underlying economics of a given investment. At a minimum being aware of these potential pitfalls in decision making should help investors avoid such errors and I don't understand why these would be self-perpetuating. Behavioralists appear to have some other unspecified assumptions.

2. Technical Analysis and Behavioral Finance

PPT 9-14 through PPT 9-30

Technical analysis (TA) uses price and/or volume data to attempt to find undervalued securities. Technicians believe that there are predictable patterns in stock prices and that these patterns can be exploited to secure abnormal profits. Technical analysts believe that market prices conform to new data

only slowly; giving rise to price trends and/or that prices are affected by predictable behavioral or psychological factors. The so called 'disposition effect' may help explain the first TA belief. Under the disposition effect investors exhibit loss aversion so that they are reluctant to sell on bad news and price converges slowly to its new fundamental value. While some investors undoubtedly behave this way, this seems unlikely to be a true description of market prices behavior.

The PPT covers various simple technical analysis rules. There are a vast number of TA rules that can be used; some are far more complex than those described in the text. There is a whole set of jargon used by technical analysts that is well, very technical.

Technical rules include trends and correction techniques such as the Dow Theory and point and figure charts where chartists look for trends and congestion areas (the latter are periods where there is no apparent trend). Other indicators that technicians use are moving averages: when the stock price rises above the moving average, it is an indication that the stock will continue to increase in price and a buy signal is said to occur. A sell signal occurs when the stock price falls below the moving average. The breadth of stock price movements looks at the extent to which movements in a broad index are reflected widely in movements of individual stocks. Some of the more popular charting methods used are defined. Several sentiment indicators are displayed in the PPT. The Trin statistic measures the number and trading volume on stocks that are advancing and declining. If the Trin statistic exceeds one, a bearish signal occurs. For many indicators, both bullish and bearish views are possible for the same relative measure of a statistic. Using the put call ratio as an example, when the number of puts gets large relative to calls, a bearish interpretation may be inferred because investors buy puts to protect against stock price declines. If most investors are bearish, the number of puts will rise. Some contrarian investors argue that when the number of puts gets high it is an indicator that market participants are too pessimistic. For a contrarian, a rise in the put call ratio is bullish.

As a final word of warning—the ability to discern apparent patterns with stock market prices is often irresistible and, as a result, it is also possible to perceive patterns that may not exist. This is aptly illustrated in the PPT using the associated figures in the text.

3. Selected Problems

> PPT 9-31 through PPT 9-36

Two multiple part discussion problems are included in the PPT that are related to market efficiency and behavioralism. The problems also include a suggested fix for the behavioral problems specified.

CHAPTER TEN
BOND PRICES AND YIELDS

CHAPTER OVERVIEW
This chapter presents various types of bonds, bond characteristics, bond safety and bond ratings, and pricing and yield calculations. This edition also covers credit default swaps.

LEARNING OBJECTIVES
After studying this chapter, the student should be able to calculate bond prices including accrued interest, promised yields and realized yields (called holding period yields or HPYs). Readers should also understand how bond prices change as they approach maturity. The text discuses what bond ratings mean and provides some of the major ratios that ratings agencies use. The reader should also have a basic understanding of credit default swaps and yield spreads. They should be able to understand the effects of common bond features such as the call feature, convertibility and sinking fund provisions on bond yields. Finally students should understand what determines the shape of the yield curve.

CHAPTER OUTLINE
1. Bond Characteristics

> PPT 10-2 through PPT 10-14

Data from 2008 on the size of the bond markets is provided at the beginning. Notice that the bond markets in total are much larger than the equity markets. Basic characteristics of bonds follow in the PPT. Stress that the most common denomination is $1,000 for corporate bonds and Treasury bonds. Individual investors can buy $100 par T-notes and T-bonds but the standard is $1,000, and in many cases the bonds are bundled and sold as a group in multiples of $1,000. Bonds issued by federal agencies and municipalities may not have $1,000 par. Many will have substantially larger par amounts because of the institutional nature of these markets. Note the main differences with the municipal bonds are the tax features and insurance. Interest income on municipal bonds is not taxed at the federal level and often if an investor buys a bond issued by an entity in their home state the interest income is exempt from state taxes as well. Capital gains taxes will still apply. Many municipal bonds are insured by a bond insurer such as MBIA. This is done to improve marketability.

U.S. bonds are registered, but most bonds issued outside the U.S. are bearer bonds. With bearer bonds you must clip off the coupon and mail it in to get your interest as you are not a registered owner, although a broker can do this for you. With registered bonds the issuer and the issuer's trustee knows you are the owner and you will receive your interest and principal payments automatically. Registration helps the IRS ensure that interest income is declared for tax purposes.

A list of major corporate bond provisions is presented in the PPT. Secured bonds are backed by assets of the corporation which serve as collateral for the bond. Unsecured bonds, referred to as debentures, have no specific assets that serve as collateral. A callable bond gives the issuing corporation the right to call the bond back from the bond holders. The call provision is in the favor of the bond issuer, the issuer is likely to call in the bond when interest rates have fallen. The bond will be redeemed at a price over par, but the investor will be left with reinvesting in a lower interest rate environment. The firm is not going to call the bond unless its market value would have been above the call price. Most bonds are callable after

an initial call protection period of 3 to 5 years. The quid pro quo is that bond issuers will have to pay a slightly higher yield rate if the bond is callable. Convertible bonds may be converted to common stock at the option of the bondholder. This one is in the favor of the bondholder and the conversion 'sweetener' may reduce the required return. In a putable bond the bondholder has the right to put the bond back, sell it back, to the bond issuer, usually on a coupon payment date.

Foreign bonds are bonds issued by a borrower from a country other than the one in which the bond is sold. The bonds are denominated in the currency of the country in which it is sold. They are often given colorful names. For instance, Yankee bonds are bonds issued in the U.S. by foreign borrowers; they are denominated in U.S. dollars. Likewise, Samurai bonds are issued in Japan by non-Japanese borrowers and are denominated in yen. Bulldog bonds are issued in Great Britain by non-British borrowers and are denominated in British pounds. Eurodollar bonds are dollar denominated bonds issued outside the U.S. They are thus not regulated under U.S. securities laws the way Yankee bonds are. Yankee bonds must be registered with the SEC for example. Similarly Euroyen bonds are yen denominated bonds that are issued outside of Japan. These offerings allow banks and corporate treasurers to borrow money in different currencies and at different interest rates.

A list of many of the key innovations in the bond market is provided. Developments in the asset-backed markets are changing traditional methods of finance for many corporations. One of the innovative types of bonds, inverse floaters, was a type of security held by Orange County Municipality when they went bankrupt. While they were holding the floaters interest rates rose about 200 basis points, creating large losses on the bonds. The losses, coupled with a high degree of leverage caused the fund to go bankrupt.

2. Bond Pricing

PPT 10-15 through PPT 10-18

The bond pricing equation and a sample calculation are presented in the PPT. The example is set up so that you can ask the students to calculate the result and then show them the answer.   Textbooks often use T for a time counter but many of the students' calculators will use N and that is what I used in the formula. Note that the PPT also provides the percentage of the present value that is provided by the coupon payment stream and the percentage due to the principal payment at maturity. These percentages affect the riskiness of the bond, to wit, the extent to which the bond's price will be affected by an interest rate change.

Prices that are quoted in the financial pages do not contain accrued interest. Most pricing examples that we use in finance also do not include accrued interest. Actual invoice prices to buy a bond will include any interest that has accrued since the last coupon payment. The flat price or quoted price assumes the bond is purchased on a coupon payment date. If the bond buyer purchases a bond between payment dates the buyer's invoice price = flat price + accrued interest. Accrued interest can be calculated with the following formula:

$$\text{Accrued Interest} = \frac{\text{Annual Coupon\$}}{2} + \frac{\text{Days since last coupon payment}}{\text{Days between coupon payments}}$$

The key provisions for a bond are outlined in the indenture (or contract) of the bond. Note that the indenture will specify a trustee to enforce the covenants in the bond contract. Covenants are specific

provisions within the bond contract that specify things like payment terms, financial constraints on the bond issuers such as a maximum debt to equity ratio, minimum liquidity ratios, maximum dividend payment, etc.

3. Bond Yields

PPT 10-19 through PPT 10-27

The relationship between bond prices and yields along with a graph of the relationship are presented. The concept of yield to maturity can be related to prior work the students have done by equating it to the IRR. The yield to maturity is simply the discount rate that equates the present value of the cash flows from the bond to its current price. Finding the ytm is a trial and error solution unless you have a financial calculator. There is also a major assumption associated with this calculation. If the ytm solution is to be your actual rate of return one must reinvest each coupon as it is received for the remaining time to maturity at a reinvestment rate equal to the calculated promised yield. There is no mechanism to ensure that a bondholder can earn this rate of return. Mutual funds or a broker can automatically reinvest the coupon income but there is no guarantee it will earn the same promised yield rate. The ytm is the yield rate used to fix the price of the bond rather than the last word on what rate an investor can actually expect to earn. This is why the holding period yield (HPY) realized return should be calculated using the actual reinvestment rate on the coupon. You would then calculate the HPY using the modified internal rate of return methodology taught in corporate finance and presented in the text.

Alternative measures of yield are also presented. The current yield is measured by the annual dollar coupon divided by the current price of the bond. The discussion of current yield can also be tied to the discussion of discount and premium bonds through examples. The discount bond increases in price to compensate the bondholder for a lower current yield while the opposite occurs with a premium bond.
The PPT also displays how the call option affects value when comparing a callable and non-callable bond. The call provision caps the upside potential when rates decline. The impact that reinvesting has on future values is also shown.

4. Bond Prices over Time

PPT 10-28 through PPT 10-31

The behavior of discount and premium bonds over time is presented. Class discussion of the reasoning behind the premium and discount as it relates to current yields helps students to understand pricing. A premium bond is priced above par because the coupon rate is too high relative to what the bond is supposed to be yielding. The only way to get the expected yield down to the ytm is to have the bond priced above par. In this case, the current yield on the bond will be above the promised yield. Hence there must be a capital loss on the premium bond over the year to get the overall yield down to the promised ytm. These price movements over time are called the "Pull to Par" that all bonds with a finite maturity experience. STRIPS are Treasury securities where the coupon payments and the final principal payment are 'stripped' out and sold separately. These can be useful for cash matching when a payment is due in a set time period in the future.

The IRS rules that the built in price increase due to approaching maturity on all original issue discount (OID) bonds is taxable as interest income and is taxed at the investor's ordinary income tax rate. Any other gains or losses on the OID bond are treated as capital gains or losses. This is true for all OIDs, not just zeros.

5. Default Risk and Bond Pricing

PPT 10-32 through PPT 10-44

The rating systems contain major and sub-categories that allow for differentiation in the major categories. The highest four major categories are labeled as investment grade. Bonds that have ratings in lower major categories are referred to as speculative grade or junk bonds.
The major factors that determine a bond's rating are provided The highest rated firms have high levels of profitability, high levels of cash flow to debt, high levels of coverage and liquidity ratios and lower levels of financial leverage.

Some bond contracts have covenants that provide protection against default. Sinking funds can prevent a cash crisis at maturity since they require the firm to systematically repay part of the principal. The larger cash flow requirements of a sinking fund can substantially reduce coverage and cash flow ratios prior to maturity and may not serve their intended purpose for all issues. Note that some sinking funds and serial bonds may actually hurt a bond investor's rate of return. In some sinking funds the issuer may repurchase a given fraction of the outstanding bonds each year, but in others the issuer may either repurchase at the lower of the open market price or at a pre-specified price, usually par; in the latter case bonds are chosen randomly. The second type of sinking fund may hurt investors if interest rates fall in the same way that calling bonds can hurt the bondholder. Serial bonds are not callable and this is a plus, but the staggered maturities can reduce the liquidity of the bonds and make them more expensive.
Subordination of future debt and dividend restrictions serve to protect existing creditors. Collateral provides the protection of asset value in case of default. The Mobil issue in the PPT contains an illustration of protection included in the indenture. Students should be aware that a bond without any collateral is termed a debenture.

Defaults, Credit Default Swaps (CDSs) and the Financial Crisis

During the credit crisis of 2008 the spread between Treasury bonds and junk bond yields widened from 3% in 2007 to 15% at the start of 2009! Many blame the crisis on excessive use of exotic derivatives such as CDSs. They are partly correct but excess leverage, lax regulation, excessively cheap credit, congressional interference in the mortgage markets, currency manipulation by export driven countries, unethical mortgage originators and misaligned executive pay incentives all played a significant role, along with major failures of the ratings agencies to identify the level of risk involved in mortgage securities. Ratings agencies are paid by the firms issuing the securities. This creates a large conflict of interest between the issuer and the bond rater. The government has granted a monopoly to the top three rating agencies, although others exist. One wonders why. Even now, participation in TALF funding requires the securities be rated by one of the big three (Moody's, S&P and Fitches). We have known for a long time that bond prices move ahead of announced downgrades in ratings. This is probably not due to information leakage ahead of the announced change, but rather due to the slowness of the agency to respond and the unwillingness to downgrade. These agencies have to change. They are also guilty of extrapolation bias as explained below.

A credit default swap (CDS) is an insurance policy on the default risk of a bond or loan. The seller of the swap collects an annual premium (and sometimes an upfront fee) from the swap buyer. The buyer of the swap collects nothing unless the bond issuer or loan borrower defaults, in which case the seller of the swap essentially pays the drop in value from par to the swap buyer. Hedge funds (and AIG!) are the main sellers of CDSs. They have sold 60% of investment grade and 80% of low grade debt default swaps. CDSs can also be used to speculate on financial health of firms as the swap buyer need not hold the underlying bond or loan. At their peak there were reportedly $63 trillion worth of CDS; US GDP is about $14 trillion. Obviously if the economy experiences greater than expected defaults these contracts magnify the losses many times over resulting in a series of defaults. More detail can help students to understand this problem. With a CDS there was no principal investment required, a low capital requirement (important if regulated) and if seller has strong credit rating, little collateral was required. The result was excessive risk taking on both sides. Buyers take on more risk because they are insured, even though insurer's collateral was woefully inadequate. Seller does not plan on having to ever make the payment so does not have sufficient collateral or credit to get it. This is also a good example of extrapolation bias discussed in the behavioral chapter. Financial modelers had modeled only a 5% percent chance of any drop in home prices on a national basis. … So their models told them that writing the swaps was not risky. In hindsight, they were terribly wrong.

As the text points out the lack of transparency in this market helped cause the credit freeze up after the subprime mortgage crisis began. No one could tell the obligations and exposure of counterparties so it was too risky to make a loan. AIG had over $400 billion in CDS contracts on subprime mortgages and other loans and was obviously going bankrupt. If AIG went under, it might have triggered defaults at other institutions that were counting on payments from AIG to protect their own investments. Ultimately the government decided it was too risky to let AIG become insolvent. New regulations on CDS will certainly be implemented although the industry is fighting the changes. CDS contracts will be required to be traded on an exchange with collateral requirements to limit risk. Exchange trading will also increase transparency of positions of institutions.

6. The Yield Curve

> PPT 10-45 through PPT 10-53

The term structure of interest rates depicts the relationship between term to maturity and maturity for a group of bonds that are identical in all aspects except maturity. In practice, identical means the same rating, preferably the same coupon so that you don't get into tax differences.

The major theories that are used to describe the relationship between yield and maturity are presented in PPT 10-34. The expectations theory asserts that long-term rates are determined solely by expectations of future short-term rates. The liquidity preference theory asserts that long-term rates are determined by expectations of future short-term rates but also include added compensation, a liquidity premium, for greater risk.

The Pure Expectations Theory of the Term Structure
Long term rates are a function of expected future short term rates. This is the case with some restrictive assumptions. First, if transactions costs are zero, securities are perfectly divisible, and most importantly, future interest rates can be perfectly predicted. With these assumptions a simple arbitrage argument will require that the long term spot rate equal the (geometric) average of the expected future short term rates.

If the n-year long rate was above the average of the short term rates the investor could borrow money one year at a time and invest the money at the long rate for n years all at once. This must yield a riskless profitable arbitrage that requires no initial investment. Investors are indifferent between investing for n years all at once or for investing n year by investing a year at a time, or at any combination of years that add up to n. This is a key point. In this case an upward sloping term structure unambiguously implies that the market is expecting higher future short term rates and a downward slope means that the market is expecting lower future short term rates.

Liquidity Preference
The liquidity preference idea deals with the reality that future interest rates cannot be forecast perfectly so that the arbitrage argument used above is a risky arbitrage and more importantly it is riskier to invest for n years all at once as opposed to investing a year at a time for n years. To compensate investors for the risk of a long term investment they must be offered a premium. Hence, the long term rate is greater than the (geometric) average of the expected future short term rates. This implies that the actual term structure has an upward bias with respect to actual expectations of future rates because the observed long-term rate includes a risk premium.

The formula for calculation of forward rates is presented. The example is based on a 2 year bond. Depending on the scope of coverage in your class, it can be useful to extend the discussion to a multi-year context. Sample yield curves and volatility of term spreads are also provided.

Excel Applications
Two excel spreadsheets for this chapter are available on the web cite. The first spreadsheet provides a template for students to calculate bond values and the second one calculates yield to maturity.

CHAPTER ELEVEN
MANAGING BOND PORTFOLIOS

CHAPTER OVERVIEW
This chapter discusses active and passive bond portfolio management strategies. Much of the chapter is devoted to explaining interest rate risk management. The concept and use of duration are explained, as are several types of portfolio immunization strategies utilizing duration. In addition, various active strategies, or bond swaps, are described.

LEARNING OBJECTIVES
After studying this chapter, the student should have an understanding of duration, modified duration and convexity. He or she should be able to calculate duration and should understand how to construct an immunized portfolio. The student should also understand active bond portfolio management, from the concept of interest rate predictions and exploit mispriced bonds.

CHAPTER OUTLINE
The basic decision involved in fixed-income management is the decision to purse an active or a passive investment strategy. An active strategy seeks to earn superior returns from the fixed-income portfolio. Superior returns can be earned if the investor can predict interest rate movements that are not currently incorporated into a bond's price or if the investor can identify bonds that are mispriced due to other factors. For example, finding a bond that has a credit risk premium that is too large for its level of risk creates an opportunity to purchase a bond with an abnormally low price. Passive management of a bond portfolio focuses on earning the promised yield by minimizing the effects of interest rate changes on the portfolio rate of return.

1. Interest Rate Risk

> PPT 11-2 through PPT 11-15

As interest rates rise and fall, bondholders experience capital gains and losses and changes in the future value of reinvestment income. Thus bond yields are subject to interest-rate risk even when coupon and principal payments are paid as promised. The text and the PPT present six rules of bond pricing:
1. Inverse relationship between bond price and interest rates (or yields)
2. Long-term bonds are more price sensitive than short-term bonds. There are some exceptions to this rule because deep discount bonds can have a lower duration at longer maturities. This is pretty much a math quirk and won't be true for most traded bonds.
3. Sensitivity of bond prices to changes in yields increases at a decreasing rate as maturity increases
4. A bond's price sensitivity is inversely related to the bond's coupon. If interest rates increase and I have a high coupon bond, I am getting more current income to reinvest at the new higher rates so my bond's price is not affected as much a bond with a lower coupon and vice versa.
5. Sensitivity of a bond's price to a change in its yield is inversely related to the yield to maturity at which the bond currently is selling. At higher yield rates the present values of the more distant cash flows are reduced by more than the present value of the nearer in time cash flows. Thus at higher yield rates the near term cash flows make up a higher percentage of the bond's value. With more of the value based on near term cash flows, the bond will have lower price volatility.

6. An increase in a bond's yield to maturity results in a smaller price decline than the gain associated with a decrease in yield. This is an artifact of convexity. Because the bond price interest rate relationship is curvilinear, a given increase in interest rates results in a different percentage price change than the same decrease in rates.

The main points can be succinctly summarized:
1. Any security that gives an investor more money back sooner (as a % of your investment) will have lower price volatility when interest rates change.
2. Maturity is a major determinant of bond price sensitivity to interest rate changes, but
3. It is not the only factor; in particular the coupon rate and the current ytm are also major determinants.

Be careful not to equate lower price volatility with lower interest rate risk. Interest rate risk is reduced by minimizing the difference between the duration of the bond portfolio and the investor's investment horizon and not necessarily by reducing the duration or the price volatility.

Duration is the first derivative of the bond price formula with respect to interest rates. The description of duration that is used here stresses the concept of average life. Since the measurement of duration considers the timing and value of intermediate payments, it is an accurate measure of average life and is more meaningful than maturity for a bond that has coupon payments. Students have a difficult time grasping the concept of duration even when given the definition. The weight of each cash flow for a fixed income instrument is the present value of the cash flow as a percentage of total value. Duration is the sum of the product of the weights of each cash flow and the period that it is received. The measure is in units of the cash flow payment during the year. For example, with a mortgage that has monthly payments, duration would be in months. For a bond with semi-annual compounding, the measure would be in 6 month periods. The duration is affected by the coupon rate, the discount rate and maturity.

Duration can be used to predict the price change of a coupon bond when interest rates change because price changes on fixed-income securities are approximately proportional to duration. Duration incorporates both the coupon rate and maturity effects on price volatility into a single measure. The concept of modified duration is used extensively in the industry.

The text also presents modified duration but it does not really explain why modified duration is useful.

D^* = modified duration

$D^* = D / (1+y)$

$\Delta P/P = - D^* \times \Delta y$

The minus sign in this equation reminds us that if interest rates go up, prices go down and vice versa. Although the text simplifies this you have to be careful using modified duration. It is used for instruments that have non-annual cash flows as follows:

"Modified duration" = Duration_{Mod}

The purpose is for use with bonds & loans with non-annual payments

$\text{Duration}_{Mod} = \text{Duration}_{Annual} / (1 + r_{period})$; where r_{period} = periodic interest rate, typically semiannual for a bond

The predicted price change using modified duration is

$\Delta P/P = -\text{Duration}_{Mod} * \Delta r_{Annual}$

Notice using modified duration allows one to plug in the annual rate change rather than the change in semi-annual rates. This is why it is commonly used by practitioners.

2. Passive Bond Management

PPT 11-16 through PPT 11-24

Interest rate risk is the possibility that an investor does not earn the promised ytm because of interest rate changes. A bond investor faces two types of interest rate risk:

1. Price risk: The risk that an investor cannot sell the bond for as much as anticipated. An increase in interest rates reduces the sale price.
2. Reinvestment risk: The risk that the investor will not be able to reinvest the coupons at the promised yield rate. A decrease in interest rates reduces the future value of the reinvested coupons.

The two types of risk are potentially offsetting because if interest rates rise, the sale price will fall but the reinvestment income will be higher and vice versa. If we could choose just the right amount of price volatility to offset the change in the future value of the reinvestment income we could eliminate interest rate risk. We are then said to be 'immunized.'

Immunization of interest rate risk is a tool that can be used for a type of passive management. Immunization is an investment strategy designed to ensure the investor earns the promised ytm. Financial institutions use immunization to minimize risk to their rate of return on investments and to minimize the exposure of their equity to interest rate changes on their financial assets and liabilities. To control for interest rate risk, managers of financial institutions minimize the difference between the durations of their asset and liability portfolios. Target date immunization can be used to lock in a fixed rate of return for some investment horizon. If the duration of the fixed-income investments equals the desired holding period, reinvestment risk and price offset and it is possible to approximately lock in a rate of return. Numerical and graphical illustrations of the concept of immunization are presented. Cash flow matching is another passive form but is more costly to implement as cash flows must match a series of obligations. Dedication is simply multi-period cash flow matching. Note this can be done with a set of zeros of different maturities or with coupon bonds. The STRIPS mentioned in the prior chapter can be useful for this purpose.

There are some problems with immunization strategies:

1. May be suboptimal if you have a rate forecast and are willing to take a position on which way rates will move. This is actually an important point. If you think rates will fall you want a duration longer than your investment horizon. If you are right, the portfolio will earn more than the promised ytm. If you think rates will increase you want a duration shorter than your investment horizon. Again, if you are right, the portfolio will earn more than the promised ytm. Note that this goes against conventional wisdom that states you are hurt in bonds by rising interest rates. (Real returns may be reduced if the rate increase is due to inflation, but not nominal returns.)
2. Does not work as well for complex portfolios with option components, nor for large interest rate changes

3. Requires rebalancing of the portfolio periodically, which then incurs transaction costs Rebalancing is required when interest rates move and is required over time because duration and time to investment horizon change at different rates.

3. Convexity

PPT 11-25 through PPT 11-31

Because duration is the first derivative of the bond price formula, its price change predictions strictly hold only for infinitesimally small interest rate changes. For larger interest rate changes, duration predictions will be wrong. The duration prediction is always pessimistic. It predicts a larger price drop than will occur if interest rates rise and duration predicts a smaller price increase than will actually occur if interest rates fall. Convexity corrects for these errors. Convexity measures the degree of curvature in the bond price interest rate relationship. Price change predictions that include convexity are quite accurate.
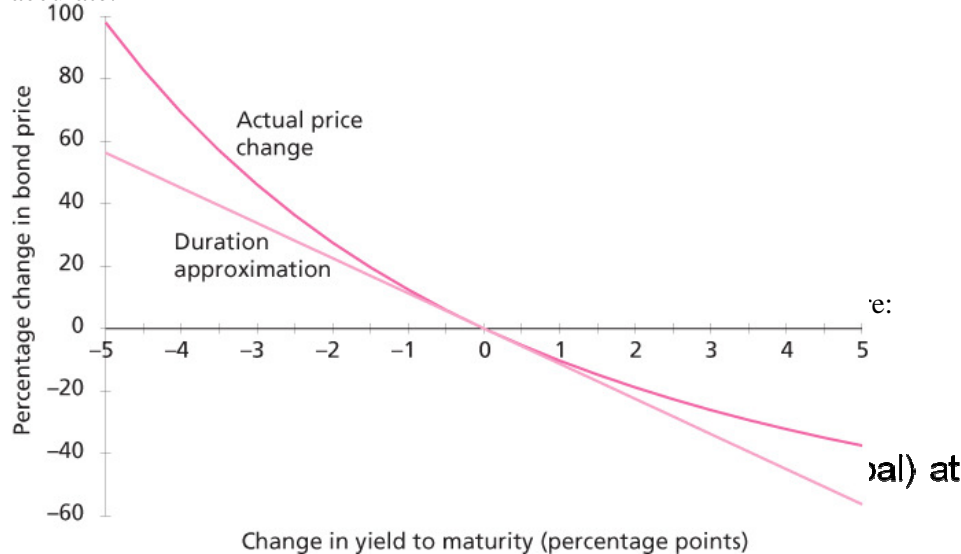
The prediction model including convexity is:

$$\frac{\Delta P}{P} = -D \times \frac{\Delta y}{(1+y)} + \left[1/2 \times \text{Convexity} \times \Delta y^2 \right]$$

4. Active Bond Management

PPT 11-32 through PPT 11-35

Several active bond strategies are presented. Various bond swaps may be instituted when the fixed income portfolio is being actively managed. Substitution, intermarket spread and rate anticipation swaps require some level of market disequilibrium. With a substitution swap, two bonds that are substitutes, offer different rates of return. The strategy involves purchase of the bond that is offering the higher rate of return and selling the bond that has the lower rate of

return. The intermarket swap requires some disequilibrium in the markets as well. In an intermarket swap, the bonds could be of different credit risk but the interest rate differential is not perceived as correct. The rate anticipation swap involves changing the duration of the fixed-income portfolio to profit from a change in interest rates. The change in interest rates must not be anticipated by the rest of the market for the swap to result in superior profits.

The remaining two swaps do not require market disequilibrium to be profitable. A pure yield pick-up involves a risk/return trade-off decision by an investor. A tax swap involves a purchase and sale of fixed income securities to take advantage of an individual investor's tax position. Horizon analysis is a form of interest rate forecasting where an analyst selects a particular investment period and predicts bond yields at the end of that period.

Excel Applications
Two excel spreadsheets for this chapter are available on the web cite. The first spreadsheet provides a template for students to calculate convexity. The second model is constructed to apply the concept of time period immunization. It is built to demonstrate how price and interest rate risk can be managed using duration. There is also an excel exhibit which provides a template for calculating duration.

CHAPTER THIRTEEN
EQUITY VALUATION

CHAPTER OVERVIEW

This chapter discusses models to calculate the intrinsic value of common stock. Balance sheet models, dividend discount models (DDMs), Price/Earnings ratios and free cash flow models are presented. These are models used in fundamental analysis rather than technical analysis. The strengths and weaknesses of these techniques are presented and discussed.

LEARNING OBJECTIVES

After studying this chapter, the student should be able to value a firm using either a constant growth or multistage dividend discount model and the price/earnings ratio model. The reader should be able to assess the relative growth prospects of stock s based on their P/E ratios. Students should also have a basic understanding of free cash flow models. The student should also understand the limitations of each of these models.

CHAPTER OUTLINE
1. Valuation by Comparables

> PPT 13-3 through PPT 13-9

Four major types of approaches are used in equity valuation. The first approach is to relate market value to an accounting value by calculating ratios such as price/book value, price/liquidation value or market value/replacement cost.   A second major approach is the dividend discount model approach. The third method is to use price/earnings ratios and the final method uses free cash flow models. The most difficult component of valuation is always the assessment of the firm's growth rates and future opportunities.

Book value is the value of common equity on the balance sheet and it is based on historical values of assets and liabilities, which may not reflect current values. Some assets such as brand name or specialized skills are not even on a balance sheet. Hence the market value of some assets may not be reflected in the book value of equity. Using a market value of equity to book ratio is thought to be a measure of market valuation over the book value, presumably due to future growth opportunities of the firm. Some believe that if the market to book is less than one it indicates an undervalued security that should be purchased. There are unlikely to be very many of these firms and one would have to examine them further to avoid firms that are underperforming for a good reason. Liquidation value is the net amount realized from sale of assets and paying off all debt. The firm becomes a takeover target if the market value of stock falls below this amount, so liquidation value may serve as floor to value. Tobin's Q = Market Value / Replacement Cost; and this ratio should tend toward 1 over time. This ratio may put a ceiling on market value in the long run because values above replacement cost will attract new entrants into the market.

2. Intrinsic Value versus Market Price

> PPT 13-10 through PPT 13-14

Underlying the process of fundamental analysis is the concept of intrinsic value. The intrinsic value is the value that the analyst places on a stock. It establishes the basis for a trading signal. An intrinsic value can be estimated using a variety of models or approaches. The section starts by presenting the expected holding period return for one year:

$$\text{Expected HPR} = E(r) = \frac{E(D_1) + \left[E(P_1) - P_0 \right]}{P_0}$$

The CAPM can be used to calculate the required return (k or k_e):

$$k = r_f + \beta \left[E(r_M) - r_f \right]$$

In equilibrium k = E(r).
Intrinsic value (V_0) is the present value of all expected future cash flows discounted by a risk adjusted required return. Based on a one year holding period we can estimate value with:

$$V_0 = \frac{E(D_1) + E(P_1)}{1 + k}$$

Comparing intrinsic value and market price can generate buy or sell signals.

3. Dividend Discount Models

PPT 13-15 through PPT 13-34

The intrinsic value equation can be generalized to multiple periods by realizing that $E(P_1)$ (the sale price in time 1) is the present value of expected future dividends after the time of sale. Because stocks are infinitely lived the valuation model is an infinite sum:

$$V_0 = \sum_{t=1}^{\infty} \frac{D_t}{(1+k)^t}$$

This equation is not useable because it is an infinite sum of variable cash flows. Therefore we have to make assumptions about the dividends to make the model tractable. If a firm's earnings and dividends are not expected to grow in the foreseeable future, the value of the stock can be estimated using the no growth model. Preferred stock exactly fits this model although regulated utilities may approximate this model:

$$V_0 = \frac{D}{k}$$

If a firm's earnings and dividends are expected to grow at a constant rate in the foreseeable future, the general model simplifies to the constant growth model.

$$V_0 = \frac{D_0 \times (1+g)}{k - g}; g = \text{perpetual growth rate in dividends}$$

The growth rate that is used in the constant model is a long-term and permanent growth rate. Students often are not clear on this concept. The approach to estimating growth using return on equity and retention rates only applies if current measures are reasonable estimates for long term values and this is a key point that the instructor should stress.

Note that stocks with high growth cost more. In other words you have to pay for expected growth. This does not necessarily mean these stocks will have better returns to investors. Buying stocks that have high expected growth is risky, because if the growth does not occur, the stock's price will collapse.

The level of reinvestment has a significant impact on growth rates. Higher levels of reinvestment lead to higher levels of growth. The concept of partitioning the value of stock into a no growth and a present value of growth opportunities component is presented.. The numerical example fits the valuation examples used earlier for the no growth and constant growth models. The concept of using the PVGO approach is very useful in assessing how much of the value is being attributed to growth and growth opportunities. If a substantial portion of the value is attributed to growth, careful analysis of the growth assumptions is appropriate. The PVGO model is given by:

$$PVGO = \frac{D_0(1+g)}{(k-g)} - \frac{E_1}{k}$$

Since many firms do not fit the constant growth model, the multistage growth approach can be used to obtain a better estimate of value in many cases. The multistage growth model allows the analyst to model firms whose earnings and dividends are expected to grow at high rates for a short time horizon. Following the rapid growth, the rate of growth is expected to settle to a normal or constant growth rate. The multi-stage model is:

$$V_0 = \left[D_0 \sum_{t=1}^{T} \frac{(1+g_1)^t}{(1+k)^t} \right] + \frac{D_T(1+g_2)}{(k-g_2)(1+k)^T}$$

The PPT also includes an example of the two stage growth model using the Value Line data for Honda. This example will help students get a feel for using real world data and help them see the assumptions that have to be used to construct an estimate of intrinsic value.

4. Price Earnings Ratios

PPT 13-35 through PPT 13-48

An alternative approach to using the dividend growth model approach is to use a P/E approach. The P/E method is used extensively in industry and is helpful in comparing relative values of firms, particularly with respect to future growth opportunities. The appropriate P/E is a function of two factors; the required rate of return and expected growth in earnings, with the latter dominating. While the P/E appears easier to use, the same estimates that apply to the dividend discount approach apply to the P/E approach. The appropriate P/E multiple depends on growth and is really a version of the dividend discount mode although many practitioners seem not to understand this.

The price earnings ratios that are presented in the chapter are based on next year's expected earnings. The P/E ratios that are reported in the financial press are often based on historical earnings. Both measures of Price/Earnings ratios are used in industry but theoretically the P/E should be based on forward or next year's earnings. A higher P/E ratio generally implies a higher expected future growth rate of earnings and if the earnings growth does not materialize, the P/E will eventually fall, generating losses for investors.

Riskier stocks, all else equal, will have lower P/E multiples as riskier firms will have a higher required rate of return. Some analysts look at the PEG ratio, which is the P/E ratio divided by the expected growth rate of earnings and dividends. Since the P/E is a proxy for growth, some investors believe that stocks with a PEG less than one are a good buy.

There are also pitfalls associated with the P/E analysis as earnings can be affected by somewhat arbitrary accounting rules. Earnings management has been pervasive. Thus, one of the issues that has become more important in the current environment is the choice of what earnings number to use in P/E analysis. The freedom of choice in reporting earnings makes the choice difficult. The graphs in the PPT can be used to discuss some of the limitations of P/E ratios including the variability in P/E ratios. Additionally, it's important to discuss the significant impact that inflation can have on price earnings ratios as higher levels of inflation lead to higher required returns, all else equal. This in turn leads to lower P/E ratios. Alternative valuation models and ratios are presented. With the price-to-book a high ratio indicates a large premium over book value, and a 'floor' value that is often far below market price. The price-to-cash flow ratio may be used instead of P/E because the former is less subject to accounting manipulation. The price-to-sales ratio is useful for firms with low or negative earnings such as firms in the early growth stage. Analysts may have to be creative and identify the key variables in an industry.

5. Free Cash Flow Valuation Approaches

PPT 13-49 through PPT 13-54

An alternative approach to the dividend discount model values the firm using free cash flow. One approach uses the free cash flow for the firm (FCFF) discounted at the weighted-average cost of capital. The value of equity is then found by subtracting the existing market value of debt. A similar approach focuses on the equity holders and discounts cash flows directly at the cost of equity to obtain the market value of the firm equity. These methods are useful for firms that don't pay dividends, and are very helpful to understand sources and uses of cash.

The FCFF may be found as:

$$FCFF = EBIT(1 - T_C) + Depreciation - Capital\,Expenditures - Increase\,in\,NWC$$

If your students used the Ross, Westerfield and Jordan Fundamentals or Essentials of Corporate Finance texts for their introductory corporate course, you can remind them that the FCFF measure is Cash Flow From Assets (CFA) in that text.

The free cash flow methods discount year to year cash flows plus some estimate of the terminal value PT where

$$P_T = \frac{FCFF_{T+1}}{WACC - g}$$

WACC = Weighted average cost of capital

g = estimate of long run growth in free cash flow
T = time period when the firm approaches constant growth

$$\text{Firm Value} = \left[\sum_{t=1}^{T} \frac{FCFF_t}{(1+WACC)^t}\right] + \frac{P_T}{(1+WACC)^T}$$

Equity value = Firm Value – Market Value

Equity residual free cash flows (FCFE) can be directly calculated with the following:

$$FCFE = FCFF - \text{Interest Expense}(1-T_C) + \text{Increase in Net Debt}$$

Equity value can then be estimated as:

$$\text{Equity Value} = \left[\sum_{t=1}^{T} \frac{FCFE_t}{(1+k_E)^t}\right] + \frac{P_T}{(1+k_E)^T} \qquad\qquad P_T = \frac{FCFE_{T+1}}{k_E - g}$$

In theory free cash flow approaches should provide the same estimate of intrinsic value as the dividend growth model. In practice the various approaches often differ substantially. Simplifying assumptions are used in all models and the details may vary slightly in the different approaches. At best the models establish ranges of likely intrinsic value and using multiple models forces rigorous thinking about the inputs.

6. The Aggregate Stock Market.

PPT 13-55 through PPT 13-59

The most popular approach for forecasting the overall market is to use the earnings multiplier technique applied to aggregate earnings. The earnings multiplier approach takes a forecast of corporate profits for the coming period for an index such as the S&P500. Derive an estimate for the aggregate P/E ratio using long-term interest rates. This can be done based on the relationship between the 'earnings yield' or E/P ratio for the S&P 500 and the yield on 10 year Treasuries and this graph is depicted in the PPT along with an example. The product of the two forecasts is the estimate of the end-of-period level of the market.

Excel Applications
This chapter contains an Excel exhibit that allows calculation of a two-stage and multi-stage dividend stock price. The multi-stage model makes it easier to apply the valuation concepts to a larger group of firms.

CHAPTER FOURTEEN
FINANCIAL STATEMENT ANALYSIS

CHAPTER OVERVIEW
This chapter discusses the income statement, balance sheet and the statement of cash flows. The text stresses the differences between accounting and economic income and provides good detail on return on equity (ROE), the decomposition of the ROE into component ratios for the purpose of financial analysis, and other ratios relevant for financial analysis. Financial statement comparability problems are also presented.

LEARNING OBJECTIVES
After studying this chapter, the student should be able to analyze a firm using the basic financial statements to perform ratio analysis. The student should be able to identify the source of problems over time by decomposing the ROE using the Du Pont procedure. Several examples are provided in the text. The effects of leverage on returns is also discussed and the concept that firms must earn a higher return than on reinvested funds than the required return to add value is amply illustrated. The student should also be able to identify comparability problems across firms due to the varying generally accepted accounting principles available to the firm and understand that accounting standards will be changing over the next several years due to the upcoming adoption of international financial accounting standards.

CHAPTER OUTLINE
1. The Major Financial Statements

> PPT 14-3 through PPT 14-11

The purpose of financial statement analysis uses the firm's accounting data. The financial statements are the starting point of a financial analysis. The income statement contains flows that occur during the current period that relate to profitability primarily. The balance sheet gives an analyst a snapshot for the firm's financial position and a broad overview of the level of investments in major asset categories. Analysts typically work with common size statements to remove size distortions. Indexed or trend statements are used to analyze changes over time.

The statement of cash flows removes much of the effects of accrual accounting to give the analyst a better look at the cash flows of the firm. The statement of cash flows recognizes only transactions in which cash changes hands. Analyzing cash flows and estimating their future levels is the crux of financial forecasting. It may be worthwhile to go beyond the text and discuss cash flow modeling of the firm according to the statement of cash flows:

Cash Flow = Operating Cash Flow + Cash Flows From Investing + Cash Flow From Financing

Operating Cash Flow = Net income + Depreciation + Net Operating Sources of Funds

Net Operating Sources of Funds = Working capital operating sources of funds – working capital operating uses of funds[2]

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[2] Operating sources and uses should include changes in working capital accounts related to operations such as inventories and receivables and should exclude non-operating sources and uses such as bank loans and short term notes payables.

Cash Flow From Investing would include net investments in fixed assets and Cash Flow From Financing will contain changes in debt and equity accounts and dividends. Note that interest expense is not included in Cash Flow From Financing and is also not added back to Operating Cash Flow.3

Not all sources of funds are equal in terms of their sustainability. A firm can increase its cash by becoming more profitable (generally a good thing), by divesting fixed assets (which could be good or bad depending on the earnings potential of the assets) or by increasing financing sources (which is probably not sustainable).

Financial statement analysis can often lead the analyst to general conclusions about a firm, but it rarely gives the analyst a sufficiently complete picture to make a forecast.

2. Accounting versus Economic Earnings

PPT 14-12 through PPT 14-13

Accounting earnings are earnings reported on the income statement that follow a set of generally accepted, but widely divergent, accounting practices. Economic earnings are the sustainable cash flow to the stockholders that does not impair the productive capacity of the firm.

3. Profitability Measures

PPT 14-14 through PPT 14-18

Return on equity and return on assets are total earnings expressed on a per-dollar invested basis. The firm's financial policies affect how ROA and ROE are linked because ROE is after tax and ROA is before interest and taxes. Note that the text uses ROA = EBIT / Assets, whereas many other texts calculate ROA = NI / Assets. It is crucial that the instructor make this point with the students. In concept the text uses a measure of operating return on assets rather than an overall return on assets.

The relationship between ROA and ROE is presented:

$$ROE = (1 - \text{Tax rate}) \left[ROA + (ROA - \text{ Interest rate}) \frac{Debt}{Equity} \right]$$

This relationship can be used to illustrate a key point about leverage and the return on equity. Using debt in the capital structure can increase the ROE if the ROA is greater than the interest rate on the debt. Hence, the choice of the optimal capital structure will be dependent on expected earnings on investments in relation to the cost of debt. Few students will understand this, but they should for their investment choices and in their personal finances. Because the interest expense is a fixed cost it adds to the risk of the firm. There is no free lunch, seeking higher returns requires taking on more risk.

4. Ratio Analysis

PPT 14-19 through PPT 14-32

Ratio analysis is used to highlight specific aspects of performance. All ratios require a benchmark (although 'rules of thumb' have been developed for some) for comparison. The benchmark may be the same ratio in a different time period or the value of a competitor or group of competitors. Ratios are very

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[3] This seems odd, as it implies that Operating Cash Flow is actually understated by interest expense, although leaving it out of both places assures that the statement reconciles with the balance sheet. Note that research that has examined firms that report their financial statements on a cash basis and an accrual basis indicates there is no guarantee that the cash flow from the statement will reconcile with actual cash flows.

important to the investment community and are used extensively in security analysis. They are also used by credit rating agencies to establish security ratings.

ROE = Net Income/Equity is the key bottom line ratio in financial statement analysis because it is a measure of the accounting return to equity. Literally it measures the firm's ability to convert a dollar of equity invested in the firm into bottom line profitability. ROE can be decomposed as follows:

$$ROE = \frac{Net\ Profit}{Pretax\ Profit} \times \frac{Pretax\ Profit}{EBIT} \times \frac{EBIT}{Sales} \times \frac{Sales}{Assets} \times \frac{Assets}{Equity}$$

$$(1) \quad \times \quad (2) \quad \times \quad (3) \quad \times \quad (4) \quad \times \quad (5)$$

$$Tax \quad \times \quad Interest \quad \times \quad Margin \times Turnover \times Leverage$$
$$Burden \qquad Burden$$

Ratio (1) Tax Burden (TB) measures the percentage of pretax profit that the firm keeps after paying taxes. Ratio (2) Interest Burden (IB) measures the percent of EBIT kept after paying interest expense. This ratio is 1 if the firm has no debt. One can see this by restating the relationship as follows:

$$\frac{Pretax\ Profit}{EBIT} = \frac{EBIT - Interest\ Expense}{EBIT}$$

The IB ratio is closely related to the times interest earned or TIE = EBIT / Interest expense. A high TIE indicates a low probability of bankruptcy. $1 - (1/TIE)$ = maximum sustainable drop in EBIT that just allows the firm to cover its interest expense. With a TIE of 5 for instance, the firm could lose $1 - (1/5)$ = 80% of its EBIT and still just cover its interest expense.

Ratio (3) Operating Profit Margin measures the percentage of sales revenue that remains after subtracting cost of goods sold, selling and administrative expenses and depreciation. Ratio (4) Asset Turnover Ratio (ATO) measures the efficiency of the firm at generating sales per dollar invested in the assets. The Margin x ATO = ROA.

Ratio (5) Leverage ratio = 1 + Debt / Equity. The leverage ratio is a measure of the percentage of debt in total capitalization. Note that it appears that using more debt as a percent of capital will increase ROE, but using more debt also reduces the interest burden ratio.

The various debt ratios are all algebraically equivalent. Knowing the Debt / Asset ratio, one can find the Equity / Asset ratio because the two ratios must sum to 1. Taking the ratio of these two will give one the Debt / Equity ratio and adding 1 to that will give the leverage ratio.

The decomposition process allows an analyst to see what factors have the most significant influence on the summary measure. For example, analysis and comparison of the factors 3, 4 and 5 highlight profit margin on sales, total asset turnover and leverage (equity multiplier). When factors 3 and 4 are multiplied together, the analyst has a measure of EBIT/Assets. This measures the operational profit of the firm without the financial leverage. The decomposition is useful in highlighting relevant factors influencing overall profit.

The types of ratios and the individual ratios that are used for the different types of ratios vary in importance for different industries. For example, inventory turnover is not critical for a service firm while inventory turnover is critical for a manufacturer.

Profitability ratios measure profits to sales, assets or equity. Four of the more common profitability ratios are displayed in PPT 14-18 and PPT 14-19. All profitability measures that include net income are subject to potential problems in comparability. Since net income is influenced by financial leverage, if firms use different amounts of borrowing, it is difficult to compare the profitability directly. We would expect firms with more leverage to have higher levels of profitability but firms using higher degrees of leverage are also riskier than firms that do not use as much debt.

Management efficiency or activity ratios are used to assess the effectiveness of management in generating sales. The most common types of management efficiency ratios are turnover measures that tie sales to assets or groups of assets. Generally, higher levels of turnover mean that the company is using its assets more efficiently in generation of sales.

Liquidity ratios are designed to measure the firm's ability to meet a short term obligation. The current ratio and the quick ratio are commonly used to measure liquidity.

Leverage ratios are used to investigate the firm's use of debt. Times-interest-earned and fixed-charge-coverage ratios are used to assess the firm's ability to service debt. Debt to assets and debt to equity are used to assess how much debt financing the firm is using.

The price-to-earnings and market-to-book ratios are presented. These ratios are regularly reported and discussed in the financial press. The relevance of the market to book ratio varies with industries. The relevance depends on how accurately the book value reflects economic value and how significant asset levels are in the production of profits and sales. Analysts also use the price-to-sales ratio as an indicator of how a stock is valued, particularly if a firm has low or negative earnings.

The PPT also includes applications of ratio analysis for Growth Industries (GI) that parallels the text. This analysis covers efficiency ratios, liquidity ratios and market price ratios. The PPT is set up so that the instructor can ask the students to calculate the ratios. Students routinely have difficulty interpreting ratios so stressing the literal interpretation of these ratios and how they reflect different aspects of firm performance should be discussed.

5. Economic Value Added

PPT 14-33 through PPT 14-36

The concept of economic value added is another tool that can be used to analyze a company's performance. Economic value added compares return on assets with a cost to the capital that is required to make the investment in assets. The main point of the analysis is management adds value to stockholders by retaining earnings and reinvesting only if the ROE > k. The related point should also be made, namely that EPS growth can be generated simply by retaining earnings, but this does not mean the firm is adding value or maximizing shareholder wealth unless the return on the investment is greater than k.

6. An Illustration of Financial Statement Analysis

> PPT 14-37 through PPT 14-39

Some of the issues that short-term borrowing brings to analysis are illustrated by the example using Growth Industries, Inc. Key ratios and the statement of cash flows for Growth Industries, Inc. show that careful analysis of financial ratios can indicate problems that may not be presented in the annual report. The analysis shows that ROE is declining while ROA is remaining steady. The firm is using large amounts of long-term debt to maintain its 20% growth in assets and this is not sustainable for very long.

7. Comparability Problems

> PPT 14-40 through PPT 14-49

Since financial ratios are based on accounting data, an analyst must be aware of differences in accounting methods that could affect comparison of ratios. Some of the key problems of comparability include different inventory valuation methods. This is an important factor since it influences cost of goods sold, which is the major component of costs on most income statements. There are also various problems related to depreciation. First, accounting depreciation is different from economic depreciation. Firms can also choose different methods of depreciation. Depreciation affects reported income and reported asset values. Inflation can distort reported income and the balance sheet. Differences in international accounting standards make comparisons of international firms difficult.   With the increased pressure on firms to meet expected earnings, more management of earnings is taking place in today's environment. Fair value accounting uses market values rather than book values in the firm's financial statements. Market value is a truer picture of the current value of the firm, as market value is forward looking and book value is backward looking. The trend is toward market value accounting   Financial Accounting Standards Board (FASB) Rule 157 classifies assets in one of three buckets: Level 1: Assets that are traded in active markets and should be valued at market prices, Level 2: Asset that are not actively traded, but their values may be estimated from market data on similar assets, Level 3: Assets that can only be valued with inputs that are difficult to observe. Level 2 and Level 3 assets may be valued using pricing models and the values may be 'marked to model.'

Note that banks must mark to market some of their asset holdings. Bankers have fought mark to market rules for years, sometimes claiming it couldn't be done, and other times claiming it shouldn't be done. The financial crisis has exacerbated the debate. We learned from the S&L crisis of the 1980s and from Japan in the 1990s that you should have mark to market rules. Otherwise the financial statements are hiding losses in periods of distress. It may make sense to mark to a calculated fundamental value rather than market value if market value is at fire sale prices during periods when markets are not functioning properly.

A list of items used by analysts to assess the quality of earnings is displayed in the PPT. A firm in the modern corporate environment has a great deal of flexibility in reporting and quality is a real issue. International accounting conventions are presented in the final part of this section. Quality of earnings refers to the realism and sustainability of reported earnings. This implies that

- Allowance for bad debts must be realistic
- Extraordinary and Non-recurring items are sometimes pretty ordinary and common
- Earnings smoothing is pervasive
- Revenue & expense recognition options

- Engaging in contingent off-balance sheet assets (certain leases) or liabilities (selling credit default swaps) that have unknowable effects on earnings

Remember that earnings are supposed to translate into cash flow and we are always trying to identify the trend in expected future cash flows.

International Accounting Conventions

Overseas firms have far more discretion in their ability to set aside reserves for future contingencies (or not) than U.S. firms have. This means foreign firms' earnings are more subject to managerial manipulation. Foreign firms typically use accelerated depreciation on their financial statements and U.S. firms don't, so foreign firms have lower reported earnings, ceteris paribus. Treatment of intangibles varies widely between countries as well, increasing comparability problems. The International Financial Reporting Standards (IFRS) have been adopted by the European Union and by over 100 countries. In 2007 the SEC began allowing foreign firms to list their securities in U.S. markets if they prepared their statements using IFRS. In 2008 the SEC ruled that large U.S. multinational firms may start using IFRS rather than GAAP in 2010 and that all firms should use IFRS by 2014. IFRS standards are principle based rather than rules based. The IFRS standards will generally allow more flexibility in reporting standards.

8. Value Investing: The Graham Technique

PPT 14-50 through PPT 14-51

The last section of the chapter provides a discussion of Benjamin Graham's techniques for investing. Graham was the founder of modern fundamental analysis. Graham believed careful analysis of a firm's financial statements could turn up bargain stocks and his work was used by generations of analysts. He developed many different rules for determining the most important financial ratios, as his ideas became popular they stopped working.

CHAPTER FIFTEEN
OPTIONS MARKETS

CHAPTER OVERVIEW
This chapter describes characteristics of options, terminology used in the options' markets, option payoffs and profits to both option owners and sellers (called writers), and positions that are comprised of combinations of options and stock or multiple option contracts. Option-like assets, such as callable bonds, warrants, and collateralized loans are also described.

LEARNING OBJECTIVES
After studying this chapter, the student should be able to calculate potential profits resulting from various option trading strategies and to formulate portfolio management strategies to modify the risk-return attributes of the portfolio. The student should be able to identify the embedded options in various assets and to determine how these option characteristics affect the prices of these assets.

CHAPTER OUTLINE
1. The Option Contract

PPT 15-4 through PPT 15-10

A listed call option is a contract giving the holder the right to buy 100 shares of stock at a preset price called the exercise or strike price. A listed put option is a contract giving the holder the right to sell 100 shares of stock at a preset price. Expirations of 1,2,3,6, 9 months and sometimes 1 year are normal contract periods. Contracts expire on the Saturday following the third Friday of the expiration month. Friday is the last day you can exercise. Contracts may be sold prior to maturity. This is an important point. You don't have to exercise to realize the value of the option. In fact in most cases an option should be sold rather than exercised because exercising forfeits the option's time value (See Chapter 16.) If a call option holder wishes to purchase the stock, he or she will exercise the option. The option holder must pay the exercise price to the option writer. Exercise prices are adjusted for stock splits and stock dividends, but not cash dividends. The cost of an option is called the premium and it is a small percentage of the cost of the underlying asset. The option buyer pays the cost; the option writer receives the cost at the time of sale of the option. The underlying company is not involved in the option market. Options are a zero sum game that transfers gains and losses between option buyers and writers that occur as the price of the underlying asset changes.

American vs European options
With an American style option the option can be exercised at any date after purchase whereas with a European style option the option can only be exercised immediately before expiration (only on the last Friday before expiration). Most options that are traded in this country are American options. Foreign currency and stock index options that trade on the Chicago Board Options Exchange are exceptions. European style options are cheaper, that is the motivation for

them. Note that the style (American vs European) has nothing to do with where the options are traded.

Options Uses
Options have a long and checkered history. There are records that show that options were used in ancient Egypt. They were also used during the tulip bulb mania in Holland and when the tulip bubble burst many option holders lost large sums and option writers defaulted. After this episode option were banned for several hundred years. Option trading has been the province of the Chicago markets, but it really didn't take off until the Black-Scholes model of option pricing was discovered. Options can be used to hedge changes in stock price, change your risk and return profile (for example, buying a call is analogous to buying stock on margin, often with a lower initial margin requirement) and avoid short sale constraints.

The OCC
The option exchanges operate the Option Clearing Corporation (OCC). An option buyer or seller technically buys or sells from or to the OCC. The OCC backs performance of both counterparties. This allows liquid anonymous trading to occur. To limit the OCC's risk the option seller (or writer) must post margin. The margin varies with option price and whether the option position is covered or exposed. An in the money option requires more margin than an out of the money option. Margin varies with the exposure of the option seller. A covered call writer write a call on which they own stock. The writer can post the stock to satisfy the margin requirement, whereas a naked call writer must post cash. When an option is exercised an option seller is randomly selected.   If a call is exercised the selected call writer must deliver 100 shares of stock in exchange for receiving the strike price. If a put is exercised the selected put writer must purchase 100 shares of stock at the strike price.

Options are available on a variety of financial assets including a host of interest rates products and currencies. Index options are very popular instruments used in hedging. Options are also available on other derivative instruments such as futures contracts. Most of the pricing and payoff examples that are built in the text are stock options.

2. Values of Options at Expiration
PPT 15-11 through PPT 15-39

This section requires the use of some terminology:
Symbols & Valuation
C_t = Price paid for a call option at time t. t = 0 is today,
T = Immediately before the option's expiration.
P_t = Price paid for a put option at time t.

S_t = Stock price at time t.
X = Exercise or Strike Price
A call is "in the money" if $S_t > X$.   A put is "in the money" if $S_t < X$.
A call is "out of the money" if $S_t < X$.   A put is "out of the money" if $S_t > X$.
An option is in the money if you could profitably exercise it right now. Basic option pricing boundaries are developed below:

The basics of option pricing
a) Price boundaries

- $C_t \geq 0$.   Why?
- $C_t \geq S_t - X$,   Why?

- $P_t \geq 0$
- $P_t \geq X - S_t$

      $5 $60 $50
- If $C_t < S_t - X$ How could you take advantage of this?
- Thus $C_t \geq$ Max $(0, S_t - X)$ - $P_t \geq$ Max $(0, X - S_t)$
- Just before expiration at time T:
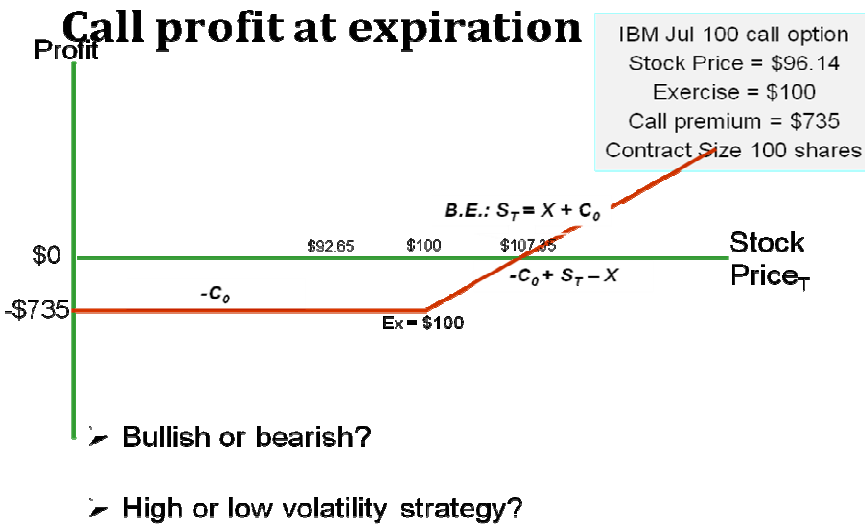   If $S_T < X$ then $C_T = 0$ if $S_T > X$ then $C_T = S_T - X$

C and P are greater than zero because the holders have a choice to use them or not. A simple arbitrage argument (shown above) can be used to demonstrate that the call price must be greater than or equal to the difference between the stock price and the exercise price. This is the basis for the price boundary of a call $C_t \geq$ Max $(0, S_t - X)$.

Constructing a profit table is an excellent method to model and understand the payoffs of any option strategy and having students work though some of these tables is an excellent teaching exercise. Several profit tables are included in the PPT and they are set up with the animation so that you can ask students to fill in the blanks. After the table is complete it is very easy to see the way the profit graph should look. For example the profit at expiration of buying a call if ST < X is –C0, hence profit is a straight line at the level equal to –C0. If ST > X then profit = –C0 + ST – X. Since the horizontal axis on the profit graph (see below) is ST and the profit equation in this region has a +1 coefficient, the profit diagram is a positive slope 45° line. See the profit table below:

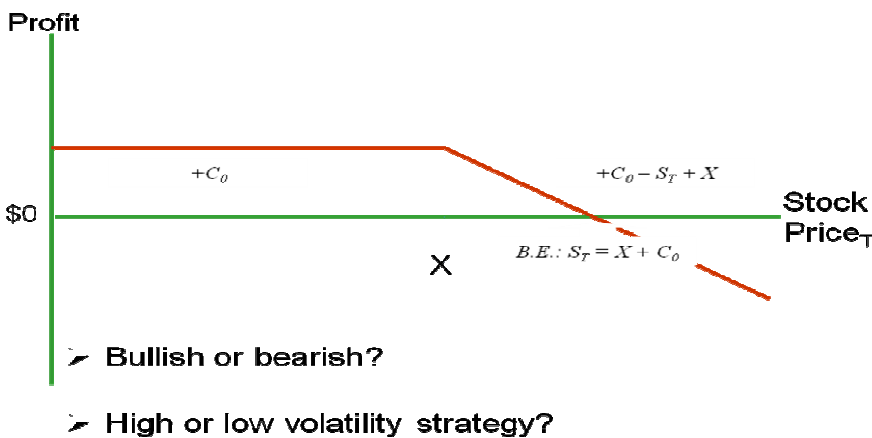| BUYING A CALL		
Profit Table	$S_T < X$	$S_T > X$
$- C_0$	$- C_0$	$- C_0$
$+C_T$	0	$S_T - X$
= Profit	$- C_0$	$- C_0 + S_T - X$
Breakeven		$S_T = X + C_0$

Using data on IMB calls given in Figure 15.1 in the text for the July 100 call we can construct the profit graph that illustrates the possible payoff at option expiration that can result at various stock prices.

Call profit at expiration

IBM Jul 100 call option
Stock Price = $96.14
Exercise = $100
Call premium = $735
Contract Size 100 shares

Profit

B.E.: $S_T = X + C_0$

$0 $92.65 $100 $107.35   Stock Price$_T$

$-C_0 + S_T - X$

$-C_0$

-$735

Ex = $100

➢ Bullish or bearish?

➢ High or low volatility strategy?

The breakeven can be found as X + C0 or $100 + $7.35 = $107.3 Buying this option is placing a bet that the stock price will climb above $107.35 by July. It is a bullish (price rising), high volatility strategy. The strategy benefits from having high stock price volatility and benefits from increases in volatility.

The profit diagram for writing a naked call can be developed similarly.

Writing a naked call

Profit

$+C_0$ $+C_0 - S_T + X$ Stock Price$_T$

$0

X   B.E.: $S_T = X + C_0$

➢ Bullish or bearish?

➢ High or low volatility strategy?

This is a bearish and low volatility strategy. Any strategy that is opens upward will be a high volatility strategy and any strategy that opens downward will be a low volatility strategy.

Option traders use Greek symbols to characterize strategies. A +Δ strategy is bullish, a bearish strategy is said to be negative delta or -Δ. A delta neutral strategy is unaffected by a stock price change or is equally affected by the same amount for a given price increase or decrease. Negative theta –τ strategies lose value as the option expiration approaches and are basically bets that that the stock price movement will be large enough to offset the so called time decay in value as the position approaches option expiration. +τ strategies gain in value as the option expiration approaches and are generally low volatility strategies that are bets that the stock price will not move very much before option expiration. Positions that open upward are negative τ and positions that open downward are positive τ. Positions that increase in value if volatility increases are said to be positive vega or +υ. Negative vega positions increase in value if perceived stock volatility declines.

The put writer has unlimited loss potential if the stock price falls. The profit for a put writer is limited to a premium of the option.   The text has an excellent boxed item entitled, "The Black Hole: How Some Investors Lost All Their Money in the Market Crash." The example of the risk involved in writing naked puts surrounding the October 1987 Market Crash points out the substantial risk in writing naked options. The profit graphs are based on the value of the option at expiration.

Some other strategies are illustrated in the PPT. A protective put involves the purchase of stock and the purchase of puts on an equivalent number of shares. The strategy reduces upside potential if the stock price rises by the cost of the put but it limits the loss if the stock declines in price.

A covered call involves ownership of stock and writing a call option. It is referred to as covered since the stock is owned if the option buyer exercised their option. The position has limited upside potential and offers some protection to the owner of the stock if the stock price declines.

A straddle is constructed by purchasing a call and a put with the same exercise date and maturity date. A straddle will result in profits if the stock price increases or decreases enough to overcome the premiums for the options.

Bullish spreads allow an option investor to gain a limited amount of profit if the stock price rises while also protecting the investor if the stock price declines.

A collar is an options strategy that brackets the value of a portfolio between two bounds and may be appropriate for an investor who has a target wealth goal but is unwilling to risk losses beyond a certain level.

Warnings about Option Strategies
Options may have to move 10-15% or more in a short time period before an investor recovers the price & commission. Most options expire worthless. Options are by definition short term instruments; an investor can ride out bad times in spot markets but not in options. The limited

loss feature makes options appear safer than they are. You have to compare equal dollar investments in stocks and options to truly see the higher risk of the option position. Options are traded in a highly competitive market and are priced according to expected volatility of the underlying asset. To profit in options you must be able to forecast price or volatility better than the competition and your gains must exceed your transactions costs. This is a tall order in a competitive market. Many brokers and planners recommend writing covered calls to gain some steady income, and most of the time the stock will not be called away from you. However, the investor never gets the occasional large stock price run up and suffers most of the loss of a big price drop. This strategy eliminates any positive skewness of stock returns and is likely to leave the investor with a portfolio of poorer performers. Writing naked calls (writing calls when you do not own the stock) limits the writer's gain to the call premium but exposes the writer to unlimited loss, and this is a poor strategy in volatile markets.

3. Optionlike Securities

PPT 15-40 through PPT 15-48

Many securities are complex products that include imbedded options. The payoffs and profits associated with securities that contain imbedded options will present payoffs that are similar to options or groups of options. Examples that demonstrate the impact of embedded options include callable bonds, convertible bonds, collateralized loans and levered equity and these are covered in the PPT. The discussion of convertible bonds is particularly important because students routinely think that convertible bonds are a good deal that combine the safety of a bond with the upside potential of equity. There is no free lunch (other than diversification) in finance. When issued the convertible option is out of the money and investors must accept a lower yield rate to get it. Often stock prices will have to increase 20% to 25% before conversion becomes profitable. Virtually all convertibles are callable as well. The issuing firm may call the bond when it is profitable to convert in order to 'force' conversion. This may shorten the expected maturity of the bond.

Collateralized loans have option features as well. Suppose a borrower is obligated to pay back L dollars at loan maturity (Time T) and has posted collateral worth St dollars. The borrower has an option to repay the loan at maturity if $L > S_T$, otherwise the borrower can default and give up the value of L. A similar logic applies to corporate equity if a firm has debt. Equity holders effectively have a call option on firm value as they can choose to pay off the debt if firm value > value of the debt or default otherwise. In order for this analysis to hold this simply the loan would have to be no recourse (other than the collateral posted) and there can be no reputation loss or other costs.

4. Exotic Options

PPT 15-49 through PPT 15-51

 Discussion of these options is useful in making students aware of the all the various types of options that are available to construct different desired payoffs. Asian- Payoff depend on the

average (rather than the final) price of the underlying asset during a portion of the life of the option. Barrier Options' value depends on whether the underlying asset price has passed through some barrier during the life of the option. For example "down-and-out" options expire worthless if the stock price drops below a specified barrier. A lookback option payoff depends on the minimum or maximum price during life of option. Currency Translated Options or Quantos allow a variable amount of foreign currency based on the performance of an investment to be translated to dollars at a fixed exchange rate. Binary or digital options pay a fixed amount if the option is in the money regardless of how far in the money the option goes. Digital options are being used to make bets on economic data such as the number of jobless claims or inflation.

Excel Applications

There are two spreadsheet applications available on the web site. The first one allows the students to examine the changes in profitability and rates of return for an example that is similar to the example in the text. The spreadsheet can be modified to allow for different combinations of options, lending and levels of stock ownership. The second spreadsheet allows students to examine the changes in payoffs and rates of returns for various spread and straddle strategies.

5. Selected Problems

PPT 15-52 through PPT 15-56

Three worked out problems are provided in the PPT. Problem 3 is very useful to point out the tradeoffs involved in purchasing options with different exercise prices, a concept that students often have trouble grasping.

CHAPTER SEVENTEEN
FUTURES MARKETS AND RISK MANAGEMENT

CHAPTER OVERVIEW
This chapter describes the futures markets, trading mechanics involved with futures trading, strategies and risks associated with futures trading and pricing of futures contracts. The material covers background material on stock index contracts, describes how such contracts can be used for hedging and speculation and discusses the concept of index arbitrage. Swaps are also briefly covered.

LEARNING OBJECTIVES
After studying the chapter students should be able to describe basic characteristics of futures contracts, understand short and long positions and profits from such positions, and margin trading arrangements for futures. Students should be able to develop prices for stock index contracts and describe how such contracts can be used to speculate and hedge. Students should also have a basic understanding of interest rate swaps.

CHAPTER OUTLINE
1. The Futures Contract

> PPT 17-3 through PPT 17-7

Basic elements of futures and forwards are described. Futures contracts are more standardized than forwards. Performance on futures contracts is warranted by the clearinghouse. Performance is not warranted on forward contracts. Futures contracts are marked to market and can be traded on secondary markets. With a forward contract there is no active secondary market.

The futures price is the price that is agreed-upon for delivery at maturity. Long positions are contracts in which the owner agrees to purchase the asset at maturity but the purchase price is determined by the futures price at the time the contract is initiated. Short positions, or selling futures, are a promise to deliver the underlying asset at contract maturity future delivery. A profit graph of the gains and losses on futures and a call option are given below:
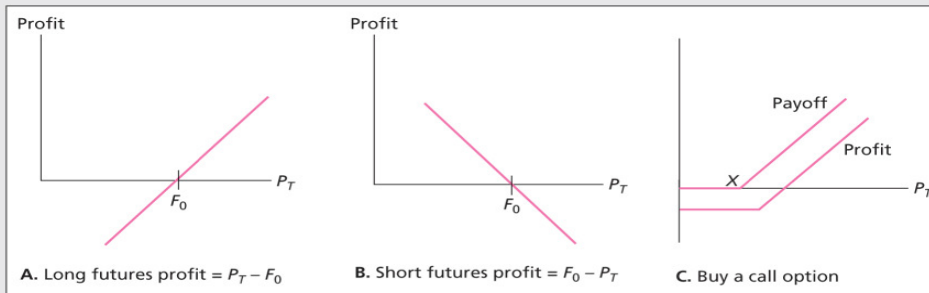

FIGURE 17.2
Profits to buyers and sellers of futures and options contracts
A: Long futures position (buyer) **B:** Short futures position (seller) **C:** Buy call option

The payoff function for the option is different because an option holder has the right to buy the underlying asset but need not, whereas the long futures position is a commitment to buy the underlying at the price F0 when the contract matures. A list of future contracts is provided below broken up into the major categories.

TABLE 17.1

Sample of futures contracts

Foreign Currencies	Agricultural	Metals and Energy	Interest Rate Futures	Equity Indexes
British pound	Corn	Copper	Eurodollars	Dow Jones Industrials
Canadian dollar	Oats	Aluminum	Euroyen	S&P Midcap 400
Japanese yen	Soybeans	Gold	Euro-denominated	Nasdaq 100
Euro	Soybean meal	Platinum	bond	NYSE index
Swiss franc	Soybean oil	Palladium	Euroswiss	Russell 2000 index
Australian dollar	Wheat	Silver	Sterling	Nikkei 225 (Japanese)
Mexican peso	Barley	Crude oil	British gov't bond	FTSE index (British)
Brazilian real	Flaxseed	Heating oil	German gov't bond	CAC index (French)
	Canola	Gas oil	Italian gov't bond	DAX index (German)
	Rye	Natural gas	Canadian gov't bond	All ordinary (Australian)
	Cattle	Gasoline	Treasury bonds	Toronto 35 (Canadian)
	Milk	Propane	Treasury notes	Titans 30 (Italian)
	Hogs	Commodity	Treasury bills	Dow Jones Euro STOXX 50
	Pork bellies	index	LIBOR	Industry indexes, e.g.,
	Cocoa	Electricity	EURIBOR	banking
	Coffee	Weather	Municipal bond index	natural resources
	Cotton		Federal funds rate	chemical
	Orange juice		Bankers' acceptance	health care
	Sugar		S&P 500 index	technology
	Lumber		Interest rate swaps	retail
	Rice			utilities
				telecom

Students are interested in these markets and if you can try to get a futures trader to come speak to your class. I have done this and it works extremely well at generating student enthusiasm and understanding for these more sophisticated instruments. I would also include a current quote sheet for a futures contract. The CME (Chicago Mercantile Exchange) website has 15 minute delayed quotes that you can show in class and explain the terms.

There are several oil contracts available. Students may ask questions about oil speculation since that has been in the news at times when oil prices rose over $100 a barrel. Speculators bore much of the blame for this. This brings up the argument about whether speculation should be allowed in futures and in spot markets. Hedging oil prices allows oil users to better predict their cost and helps keep final costs of their products down. Futures markets allow price discovery and give us better information about expected future spot prices. The futures price is a biased estimate of the expected future spot price. The reason for the bias is a risk premium and the risk premium can be positive or negative. Nevertheless we have more information than we would have otherwise. Speculators also provide liquidity to the market and keep cost of hedging (risk transference) down. If for example a cereal producer can hedge the costs of its grain purchases with futures then this may keep the cost of cereal down. Futures and options give market participants more risk return opportunities (or gives these opportunities to them more cheaply) than they would have otherwise. In other words these contracts help complete the markets. Some fear that there is

transference of volatility from the derivatives markets to the spot markets. Evidence generally indicates that this is not true in normal markets but it probably does happen in abnormal markets such as a panic; hence circuit breakers are employed in the stock markets that break the link between the two markets.

2. Mechanics of Trading in Futures Markets

> PPT 17-8 through PPT 17-16

Trades can be closed out by taking or making delivery or by reversing the trade. Most trades are closed out by reversing the trade and not by taking or making delivery. Futures trading involves a clearinghouse that acts similarly to the Options Clearing Corporation (OCC) from the prior chapter. The clearinghouse eliminates counterparty default risk; this allows anonymous trading since no credit evaluation is needed. Without this feature we would not have liquid futures markets. Entering a futures contract is a commitment to buy or sell the underlying asset. However, because the contract is liquid, over 90% of futures contracts do not result in delivery. They are instead closed out with a reversing trade. The clearinghouse nets the investor's position to zero and no more changes are made to the investor's margin account. An investor might worry that they will forget and accidentally be forced to take or make delivery. It is common to have your broker automatically close out your position on the last trading day before delivery becomes an obligation, or to roll your contract over to the next closest expiration contract. For stock index contracts, the contracts are cash settled only and no delivery can take place. Why delivery doesn't really matter is explained after the marking to market example.

Margin arrangements on futures differ from margin arrangements on stock. The initial margin on futures is a deposit that is made to assure that the contracting party will fulfill the contract. The profits and losses on the contract are realized on an immediate basis at the end of the day when the futures prices is settled. The margin is basically prepaying the possible losses for the day. When the margin falls to a predetermined level, the maintenance margin level, more margin is required to keep the position open. If the investor can't or won't post the required margin, the position will be closed out.

On Monday morning you sell one T-bond futures contract at 97-27 (97 27/32% of the $100,000 face value). Futures contract price is thus $97,843.75. The initial margin requirement is $2,700 and the maintenance margin requirement is $2,000. Margin requirements are available from the CME. These were current when I looked them up but they change frequently as volatility changes. The sizes of the margin requirements are chosen based on daily volatility to limit the clearinghouse's risk. The clearinghouse basically requires the participants to prepay potential daily losses and then all the house does is transfer funds from the long to the short and vice versa. Note that brokers may require higher margin accounts than the exchange mandated minimums stated here. They typically will require higher minimums for retail accounts.

Day	Settle	$ Value	Price Change	Margin Account	Total %HPR (cum.)	Spot HPR (cum.)
Open		$9,7843.75		$2700		
Mon.	97-13	$97,406.25	-$437.50	$3137.50	-16.2%	-0.45%
Tues.	98-00	$98,000.00	$593.75	$2543.75	-5.8%	-0.16%
Wed.	100-00	$100,000.00	$2000.00	$543.75	-79.9%	-2.2%
				+$2156.25 $2700.00		
(1)	(2)	(3)	(4)	(5)	(6)	(7)

The settlement prices are in dollars and 32nds. The settlement price is determined by an exchange committee at the end of each day's trading. Usually it will be the last trade price, although it may vary slightly depending on the volume of trades around the closing. The translated dollar value is in column (3). The price change, column (4) is the new price minus the old price. Column (5) contains the effects on the margin account. Note that as the investor went short, a drop in price is a gain and adds to the margin account whereas price increases are losses. The total %HPR is found from as the cumulative (cum) percent change in the margin account column. For instance, 16.2% = (3137.50 – 2700)/2700, (the price fell so this is a gain to the short, who can ostensibly buy in the spot now and sell at the futures price)
-Similarly,
5.8% = (2543.75 – 2700)/2700,
-79.9% = (543.75 – 2700)/2700

The spot HPR (cum) is the percent change in the $ value column, keeping the Monday open as the basis. This represents what the % return would have been had you 1) used the spot market rather than the futures market and 2) the $ value column = spot prices. It may be used to illustrate the leverage provided by the futures contract. The calculations are shown below:
0.45% = (97,406.25 – 97,843.75)/97,843.75
-0.16% = (98,00.00 – 97,843,75)/97,843.75
-2.2% = (100,000.00 – 97,843.75)/97,843.75
The leverage multiplier can be found by taking the ratio of the futures return / Spot HPR return, for example 16.2% / 0.45% ≈ 36.

Why delivery on futures is not an issue:

You go long on T-Bond futures at Futures0 = $110,000. Suppose that at contract expiration, Spot$_{T\text{-Bonds}}$ = $108,000. With daily marking to market, you have already given seller $2,000 in total so if you take delivery you only owe $108,000. The invoice is adjusted by the net daily marking to market. You are prepaying/earning any gains or losses each day. With no delivery made the seller of the T-Bonds could sell his bonds spot for $108,000 and the seller has already gained $2,000 from the daily marking to market. The net proceeds to seller are $110,000, which is the contracted futures price.

As the contract nears maturity, the spot price and futures price converge. Similarly, the basis, which is the difference between the futures price today and the spot price today will converge to zero.

3. Futures Market Strategies

PPT 17-17 through PPT 17-20

Futures contracts can be used to speculate on price movements or to hedge against price movements. A speculator is hoping to profit from a price change. If a speculator expects the price to fall, a short position is taken. The investor sells the asset at the high price and reverses the trade by purchasing the asset at a lower price in the future. A hedger is protecting against an unfavorable movement in price.
Hedges are named by the position taken in the futures market. Hence a long hedge would entail buying futures. For example, suppose an endowment fund will purchase stock in 3 months. The manager may buy stock index futures now to protect against a rise in price. Similarly, suppose a hedge fund has invested in long term bonds and is worried that interest rates may increase. The fund could sell futures (a short hedge) to protect against a fall in price.

The basis is the difference in the futures price and the spot price. The basis narrows as the contract approaches maturity. Basis risk is variance in the basis. Hedging involves the exchange of price risk for basis risk.

4. The Determination of Futures Prices

PPT 17-21 through PPT 17-26

Pricing on futures contracts is described using the spot-futures parity theorem. The theorem is based on the concept that there are two ways to acquire an asset for use in the future. First, the asset could be purchased at the spot price today and stored until it is needed. Second, a long position in futures could be established today and funds could be placed in an interest-bearing account to acquire the asset in the future. The two strategies must have the same costs. Alternatively you could borrow the amount to acquire the spot, buy the spot and simultaneously sell the futures short. Either way will illustrate that the difference between the futures and the spot prices is the cost of carry.

Action	Initial Cash Flow	Cash Flow at T
1. Borrow S0	S_0	$-S_0(1+rf)^T$
2. Buy spot for S0	$-S_0$	S_T
3. Sell futures short	0	$F_0 - S_T$
Total	0	$F_0 - S_0(1+rf)^T$

In the text and PPT example, a few assumptions should be made explicit. First, the only cost of carry in this example is the time value of money represented by the risk free rate, so we are ignoring any physical storage cost of the commodity which would normally have to be added on. Borrowing the money to buy the spot commodity, buying the spot and concurrently short the futures is riskless because you have the spot and you have locked up the sale price of it with the futures contract. Hence the only difference is the time value of money. The more general cost of carry model is:

F0 = S0 + Net Interest Cost + Storage cost

The Net Interest Cost (NIC) is the cost to borrow S0 from now until T net of any earnings from owning S0. If the spot pays some cash such as a coupon on a bond the NIC could be less than zero. The cost of carry is typically positive and when it is the market is said to be in 'contango.' When the cost of carry is negative the market is said to be in backwardation. The cost of carry can be negative if the yield on the spot commodity is greater than the storage and funding cost. Oil markets are sometimes in backwardation, usually when there are concerns about future supply disruptions. Then owning oil spot carries a convenience yield that can exceed the cost of carry.

Figure 17.5 in the text shows the S&P 500 Monthly Dividend Yield is fairly stable and Figure 17.6 shows how the prices for three different futures contracts of gold move in lock step with each other.

5. Financial Futures

PPT 17-27 through PPT 17-37

Stock index contracts have improved many trading and hedging strategies. Stock contracts are available on a variety of domestic and international stock indexes. They offer considerable advantages over direct stock purchases. The advantages of futures indexes apply to investment strategies and also hedging strategies. An investor that is fearful of a market decline could short index futures rather than the alternative of selling equity holdings and investing in cash equivalents. The futures alternative can be implemented more quickly at lower transaction costs.

Synthetic stock positions where the individual can purchase the stock index instead of the actual shares of stock is presented. Discrepancies in the parity-pricing relationships can be exploited via index arbitrage. This is a form of program trading. Sample contracts are presented in Text Figure 17.2 which is replicated here (see below). Index contracts reduce the cost of a classic market timing strategy involving switching between Treasury bills and stocks based on market conditions. It is cheaper to buy Treasury bills and then shift stock market exposure by buying and selling stock index futures. In this

strategy the investor is changing the relative weights on the riskless and risky asset. Index arbitrage exploits mispricing between underlying stocks and the futures index contract. If the futures price is too high and one would short the futures and buy the underlying stocks. If the futures price is too low one would go long in the futures and short sell the underlying stocks.

TABLE 17.2
Stock index futures

Contract	Underlying Market Index	Contract Size	Exchange
S&P 500	Standard & Poor's 500 index. A value-weighted arithmetic average of 500 stocks.	$250 times the S&P 500 index.	Chicago Mercantile Exchange
Dow Jones Industrials (DJIA)	Price-weighted arithmetic average of 30 blue-chip stocks.	$10 times the Dow Jones Industrial Average	Chicago Board of Trade
S&P Midcap	Index of 400 firms of mid-range market value.	$500 times index.	Chicago Mercantile Exchange
Nasdaq 100	Value-weighted arithmetic average of 100 of the largest over-the-counter stocks.	$100 times the OTC index.	Chicago Mercantile Exchange
Russell 2000	Index of 2,000 smaller firms.	$500 times the index.	Chicago Mercantile Exchange
Nikkei	Nikkei 225 stock average.	$5 times the Nikkei index.	Chicago Mercantile Exchange
FTSE 100	Financial Times-Stock Exchange Index of 100 U.K. firms.	£ 10 times the FTSE Index.	London International Financial Futures Exchange
CAC 40	Index of 40 of the largest French firms.	10 euros times the index.	Euronext Paris
DAX 30	Index of 30 of the largest German firms.	25 euros times the index.	Eurex
DJ Euro STOXX 50	Value-weighted index of 50 large stocks in Eurozone.	10 euros times the index.	Eurex

Foreign currency and interest rates are also available in the financial futures markets. The majority of currency activity occurs off exchange with major banks acting as dealers in spot and forward trading. Quotes from the dealer spot and forward markets are displayed. Futures contracts are available for major currencies at the CME, the LIFFE and others, but only with limited flexibility. For instance, only March, June, September and December delivery contracts are available. This is a good point to remind the class of the differences in forwards and futures. Forwards are negotiated, face counterparty credit risk which may require posting collateral, are not marked to market and are generally not liquid. However if a corporation is a good customer of the bank issuing the forward contract the bank may cancel the contract at the customer's request.

Major contracts include contracts on Eurodollars, Treasury Bills, Treasury notes and Treasury bonds. Contracts on some foreign interest rates are also available. A short position in these contracts will benefit if interest rates increase and may be used to hedge a bond portfolio. A long position benefits if interest rates fall. A bank that has short term loans funded by longer term debt could hedge its funding risk with a long position.

6. Swaps

PPT 17-38 through PPT 17-41

One of the markets that have experienced phenomenal growth is the swap market. From 2004 to 2007 the notional principal of interest rate swaps grew at 25% per year. Swaps are basically groups of forwards that are packaged together. They allow participants in the market to hedge exposures over longer periods than futures contracts. Many swap agreements extend beyond 5 years. This makes swaps one of the best means to hedge long term exposures. In interest rate swaps one party agrees to pay the

counterparty a fixed rate of interest in exchange for paying a variable rate of interest or vice versa; no principal is exchanged. Variations are possible but this example is what is called a 'plain vanilla swap.' An example interest rate swap is presented below and in the PPT. Swaps are among the most flexible tools available and can serve a variety of purposes. In the example below two institutions use swaps to limit their interest rate risk. If an institution has variable rate or short term interest bearing assets funded by longer term fixed rate liabilities it is at risk from falling interest rates. If an institution has fixed rate or long term interest bearing assets funded by shorter term variable rate liabilities it is at risk from rising interest rates. Since an interest rate swap is simply a contract to exchange interest rate payments the two can set up a swap to reduce both institutions' interest rate risk as illustrated below.
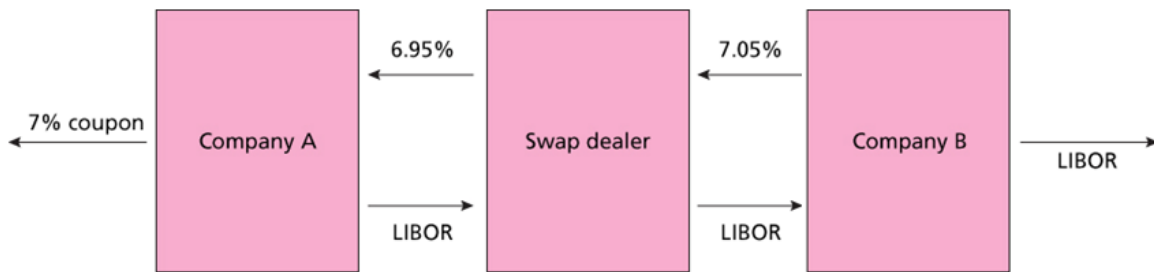
Company B pays a fixed rate of 7.05% to the swap dealer in return for LIBOR. Company A receives 6.95% from the dealer in return for LIBOR. The swap dealer realizes a cash flow each period equal to .1% of notional princial.

Company A wants variable rate financing to match their variable rate investments. They will pay LIBOR + 5 basis points

Company B wants fixed rate financing. They will pay 7.05%

Swap dealer agrees to both deals, manages net risk

Recall that LIBOR is the London Interbank Offer Rate, the rate that banks charge each other in the international banking market. Note that the swap dealer is not exposed to interest rate risk, but they do face counterparty credit risk. The two deals may not be done synchronously, and probably won't be. The dealer (typically a bank) manages the 'swap book.' The variable side is always at LIBOR (flat), the different pricing is on the fixed rate sides. This business has become highly competitive and the dealer profit spread in the example is too high.

Currency swaps are contracts where two parties agree to swap principal and interest payments at a fixed exchange rate. These contracts allow firms to borrow money in whatever currency has a lower interest rate and then swap payments into the currency they prefer. In 2007 there were $272 trillion notional principal in interest rate swaps outstanding and about $12.3 trillion principal in currency swaps. These numbers are from the BIS (Bank of International Settlements) which collects data on all OTC derivatives and publishes a triennial survey of market size. The $272 trillion (yes that is not a typo, its trillion) vastly overstates the market size because interest rate swaps don't involve principal exchanges. Currency markets do involve principal exchanges so the $12.3 number is a more accurate measure of the market size. The numbers for interest rate swaps include only single currency swaps, and the euro is now the number one currency involved in swaps rather than the U.S. dollar.

Excel Applications
There is an excel application on the web site that allows students to examine spot futures parity and time spreads with different futures contracts.