Unit11
Financial Investment

Investment vs. Saving

- How is investing different from saving?
  - Investing means putting money to work to earn a rate of return, while saving means put the money in a home safe, or a safe deposit box.
  - Investments usually have a higher expected rate of return than saving, though sometimes investment can have negative returns.
  - In exchange, there are risks involved with investment.
- Although in our daily language the term "saving" is often used as if it were "investing" (for example, savings account that earns an interest rate), in personal finance we do differentiate them.

Why investing?

- Investment involves risks. Why would people be willing to take those risks?
  - Because taking this risk is the only way the purchasing power of your money might not decrease over time. If you don't earn a return, inflation will eat away the purchasing power of your money.
- Investment does not mean "getting rich quick"
  - If you are lucky you may be able to. But chances are you cannot. The main goal of investment is to transfer purchasing power to the future.

Risk - The most important concept of investment

- In the Unit on assets protection we talked about two types of risks: pure risk and speculative risk
- Investment is a type of speculative risk, which means the outcome of this risk can be either good or bad.

What are the different types of investment risks?

- Default risk (also called credit risk especially for bonds):
  - The risk of losing all or a major part of your original investment.
    - Example: When Enron stocks tanked, stockholders lost almost all of their original investment.
- Liquidity risk
  - The risk of not being able to cash-in your investment for all your money at the time you want to cash-in.
    - Example: land, houses, etc.
    - In a slow market you might have to wait years before the market bounces back and you can sell a house for the price you want.

- Interest rate risk
  - The possibility of a reduction in the value of a security, especially a bond, resulting from a rise in interest rates.
    - Example: Bond – when market interest rate increases, the value of existing bond decreases, and vice versa.
    - Note the textbook has a different definition for interest rate risk. However the definition used here is much more common in the areas of finance and economics
- Inflation risk
  - The risk that the investment return won't keep up with inflation.
    - Long-term investment tools are particularly subject to inflation risk.
- Reinvestment risk
  - The risk associated with needing to reinvest your investment returns and not being able to invest on the same terms.
    - Example: If you get \$1000 interest return on a 5-years CD paying 8%, you may not be able to reinvest this \$1000 at the same 8% return as now similar CDs might be only paying 5%.

Measuring risk

- Risk is the uncertainty about the rate of return you will earn from an investment
- The best way to measure risk is "variability of return," which is the standard deviation of past returns.
- There are two more specific measures for stocks and bonds:
  - For stocks – Beta
    - A beta of 1.0 measures the general risk of the entire stock market
    - Betas of individual stocks are then compared to the entire market
    - Example: Beta=0.5 --> The variability of the rate of return of this stock is only half the risk of the entire stock market.
  - For bonds - SP's and Moody's bond ratings
    - Example
      - SP's: AAA,AA,A,BBB,BB,B,CCC,CC,C,D
      - Moody's: Aaa,Aa,A,Baa,Ba,B,Caa,Ca,C
    - Table 8.1 on page 430 provides a good summary description of these ratings.

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The Iron Law of Risk and Return

- Risk and rate of return tend to go hand in hand.
  - High risk --> high expected return
  - Low risk --> low expected return
- This does not mean if you take higher risk, you will automatically receive higher return. In fact, in some years you might lose money. This law does mean, that on average, in the long run, risky investments can generate higher average returns.
- This also does not mean if you take higher risk in the long run you will always do better than if you take lower risk. Your actual return will depend on your particular investment choices.

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Risk-aversion

- Risk-aversion is the reluctance of a person to accept a bargain with an uncertain payoff rather than another bargain with a more certain but possibly lower expected payoff.
- For example, a person is given the choice between a bet of either receiving $100 or nothing, both with a probability of 50%, or instead, receiving some amount with certainty. The person is
  - Risk-averse if he would rather accept a payoff of less than $50 with certainty (for example, $40).
  - Risk-neutral if he is indifferent between the bet and $50 with certainty.
  - Risk-loving if it's required that the payment be more than $50 (for example, $60) to induce him to take the certain option over the bet.

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What is your risk tolerance level?

- There are many ways to assess your risk tolerance level. The Survey of Consumer Finance has a simple question:
- Which of the statements on this page comes closest to the amount of financial risk that you and your (spouse/partner) are willing to take when you save or make investments?
  1. TAKE SUBSTANTIAL FINANCIAL RISKS EXPECTING TO EARN SUBSTANTIAL RETURNS
  2. TAKE ABOVE AVERAGE FINANCIAL RISKS EXPECTING TO EARN ABOVE AVERAGE RETURNS
  3. TAKE AVERAGE FINANCIAL RISKS EXPECTING TO EARN AVERAGE RETURNS
  4. NOT WILLING TO TAKE ANY FINANCIAL RISKS
- Take a moment to see what you would choose …

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SCF Risk-tolerance question answer distribution

- For a nationally representative sample in 2008,
  - 6.4% answered substantial risk
  - 23.6% answered above-average risk
  - 41.8% answered average risk
  - 28.2% answered no risk at all
- The level of risk you should take depend on how risk-averse you are. There is no right or wrong. Studies have found that people's risk tolerance level increases with income and wealth.

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Types of investment returns and taxation

- Income return - taxed every year
  - Income paid periodically to the investor
  - Principal does not change
  - Taxed just like salary income
  - Example: dividends paid by a stock.
- Capital gain - taxed when cashed in. If you don't sell you don't get taxed.
  - Returned by an investment when you can sell it for a price higher than what you paid
  - Gain on principal
  - Example
    - Stock buying price = $50/share, selling price = $55/share
    - Capital gain = $5/share
- Combination of income return and capital gain
  - Example
    - Stock – has both income dividends and capital gains
    - Rental property – you get rents (income), and the value of the property might increase as well (capital gain)

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Return (Yield) Calculations

- Yield calculation on capital gain investment
- Yield calculation on income investment
- Yield calculation on capital gain and income investment

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Yield calculation on capital gain investment

- Annual effective yield (AEY)
  = (1+ total proportional gain)^ (1/n) - 1
  - n = number of years
- Example: Stock A
  - Beginning of year 1 -> $80/share (purchased)
  - End of year 5 -> $115/share (sold)
  - AEY = [1+(115-80)/80]^ (1/5) -1
    = (1+0.438)^ 0.20 -1 = 0.075 = 7.5%
- Example: Calculating loss
  - Beginning of Year 1 -> $80/share (purchased)
  - End of year 5 -> $60/share (sold)
  - AEY = [1+(60-80)/80]^ (1/5) -1 = (1-0.25) ^0.20 -1
    = -0.056 = -5.6% (negative means loss)

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Yield calculation on income investment

- Annual effective yield =(1+percentage gain)^1/n -1
  - Example
    - You bought a stock at $100/share. Six-month later, you got a dividend distribution of $2 per share. Then you sold the stock at $100/share. What is your annual effective yield?
    - Percentage gain = 2/100 = 2%
    - AEY = (1+2%)^(1/0.5)-1=(1+2%)^2 -1 = 4.04%
  - Example: Discount investments (you pay a lower than face-value for the investment. When it matures you get the face value)
    - Six-months Treasury Bill: You buy it at a price (9,400) < face value price (10,000)
    - R= (10,000 - 9400) / 9400 = 6.38%
    - Annual effective yield = (1+6.38%)^(1/0.5)-1=(1+6.38%)^2 -1 =13.17%

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Yield calculation on capital gain and income investment

- Simple combination of the two returns
  - Example: Stock
    - Purchasing price = $20/share
    - Selling price = $22/share six months later
    - Income distribution = $1/share at the end of the sixth month
    - Capital gain: AEY = [1+(22-20)/20)]^2 -1 = 21%
    - Income gain: AEY = (1+1/20)^2 -1 = 10.25%
    - Total annual yield
    - = AEY on capital gain + AEY on income gain
    - = 21% + 10.25% = 31.25%

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Impact of Taxes

- Tax makes a big difference in how much money you actually get. We use after-tax rates to take tax into consideration.
- After-tax yield
  - After-tax yield = AEY * (1 - marginal tax rate)
  - Example
    - AEY = 8.7%. Marginal tax rate = 28%
    - After-tax yield = 8.7% * (1- 28%) = 6.3%
  - Tax-free investment
    - Municipal bonds
      - No federal tax is charged
      - Some state taxes are waived as well.

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Impact of taxes continued

- A comparison of two investments
  - Example: Stock AEY = 8%. Municipal bond AEY = 6% (note municipal bonds are federal tax free)
    - For person 1: marginal tax rate = 33%
      - After-tax AEY for stock = 8% (1-33%) = 5.36%
      - Bond is better
    - For person 2: marginal tax rate = 15%
      - After-tax AEY for stock = 8% (1-15%) = 6.8%
      - Stock is better

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Three Basic Ways to Invest Money

- Buy nonfinancial assets (land, art, gold)
  - We will not get into the details of that in this class other than housing, which we covered in Units 7 and 8.
- Lend your money
- Buy part ownership in a company

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Lending = Buy a Bond

- There are many risks, but the following two are most important.
  - Risk 1, "Credit Risk": Borrower may go bankrupt.
    - Greatest risk: "junk bonds" ("high-yield bonds").
    - Least risk: U.S. Treasury bonds.
  - Risk 2, "Interest Rate Risk": Interest rates might rise after you buy the bond – the longer the term, the higher the risk.
    - Greatest risk: 30 year ("long-term") bonds.
    - Least risk: 1, 2, or 3 month bonds ("bills," "money market instruments").

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Combined Risk of Bonds

		Credit Risk		
		U.S. Government debt	High-grade corp., municipal, mortgage	Junk (high-yield) bonds
Interest Rate Risk	Money market (< 3 months)	No risk	Minimal risk	N/A
	Limited term (3 years)	Minimal risk	Moderate risk	Moderate risk
	Intermediate term (12 years)	Moderate risk	Moderate risk	High risk
	Long term (30 years)	Moderate risk	High risk	Highest risk

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Historical Returns of Bonds

	Money market instruments	Intermediate term U.S. treasury	Long term U.S. treasury
Annual nominal return	3.7%	5.3%	5.0%
Annual real return	-0.6%	0.4%	0.2%
Worst loss	1% (1938)	3% (1931)	9% (1967)
Years with loss	1/68 (1%)	6/68 (9%)	18/68 (26%)
Best gain	15% (1981)	29% (1982)	41% (1982)

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Buying Part Ownership in a Company = Buying Stock

- Definition
  - Stocks are shares of ownership in the assets and earnings of a business corporation.
- Types of returns
  - Income dividends: Each share of the company will earn some dividend distribution periodically.
  - Capital gain: The price of the stock may go up or down when traded in the market

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Classifications of common stock

- There are many different ways common stocks are classified. But the most basic classification is to see if the stock is mostly an income stock (return mostly comes from income dividends) or a growth stock (return mostly comes from capital gain).
  - Large company stocks are mostly income stocks
  - Small company stocks are mostly growth stocks

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Security markets

- Stocks are traded either in organized stock exchanges or over-the-counter.
  - Organized stock exchanges: NYSE, AMEX,
  - Over-the-Counter: NASDAQ
- Many security market Indexes are used to provide a summary description of the stock market
  - Dow Jones (1884, 30 stocks on NYSE)
  - S&P500 (500 stocks on NYSE)
  - NYSE, AMEX, NASDAQ composite

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Historical Returns of Stocks

	Large company	Small company
Annual nominal return	10.3%	12.4%
Annual real return	3.8%	5.2%
Worst loss	45% (1931)	55% (1929, 1937)
Years with loss	20/68 (30%)	21/68 (30%)
Best gain	55% (1933, 1954)	145% (1933), 85% (1943, 1967)

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Theories on the Determinants of Stock Prices

- Efficient-market theory (random-walk hypothesis)
  - Short-term stock price movements, such as over one year, are purely random.
- Technical theory
  - Use current market action to predict future supply and demand for securities and individual issues.
- Fundamental theory
  - Stock price is determined by current and future earning trends, industry outlook, and management expertise. Imperfect information cause some stocks to be over-priced and under-priced.
- Currently most people in academia believes the efficient-market theory.

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Ways of Buying

- Buy individual assets
- Buy mutual fund

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How to Buy Individual Assets

- Buy bonds
  - Initial sale of treasuries – you can buy treasury security directly from the government.
- Buy stocks
  - Using brokerage firm
    - Full-service brokerage firm – offers advise. Charges a commission for the service so higher fees.
    - Discount brokerage firm (internet or not)– usually no advise. Fee is lower.
  - Direct investment and direct reinvestment – sometime you can contact the company directly to buy stocks from them. See individual company policies on that.

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Mutual Funds

- These pool people's money.
- There are bond mutual funds, money market mutual funds, stock mutual funds, indeed mutual funds of almost any type of asset.
- You can put retirement IRA money into mutual funds.

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Mutual Fund Expenses

- At the low end: 0.2% every year.
  - Example: some funds run by the Vanguard Group. Disadvantage: They do not give you any personalized investment advice.
- At the high end: You get personalized investment advice, and pay up to the following (this is approximately the worst-case scenario; almost always it is less):
  - 8% front-end load (“sales charge”) [not per year]
  - 3% back-end load (“surrender charge”) [not per year]
  - 2% expense ratio [every year]
  - 0.75% 12b-1 fee [every year]
  - 1% wrap account fee [every year]
  - 1% mortality and expense risk charge [every year]

Mutual Fund Management Strategies

- Active Management
  - The investment company tries to get above-average returns for your money.
  - In most years, this fails.
- Passive Management/Index Fund
  - The investment company tries to get exactly average returns for your money.
  - This essentially always succeeds if done by a competent investment company.

The Simplest Recommended Portfolio

- A Money Market fund paying a high interest rate with permanently low expenses
- A “balanced,” low-cost Index Fund, where “balanced” means very roughly 50% stocks and 50% bonds.

Asset Allocation

- Determine the level of risk you can take and how much time you have
- Allocation
  - Diversification: cash, bonds, stocks. You need to diversify so you can reduce your risk.
- Investment strategies
  - Dollar-cost averaging: equal amount of money at regular intervals ($100 investment per month)
  - Value averaging: equal value increment at regular intervals ($100 increase in total investment value each month)