Summary Notes (Incomplete)

Wednesday, January 25, 2023 15:31

Assets

Real Assets	Financial Assets
- Land, buildings, machines, knowledge - Can be both tangible and non-tangible - E.g. patents, customer goodwill, a college education - Determines the PRODUCTIVE CAPACITY of the economy - GENERATES NET INCOME to the economy	- Securities (stocks, bonds, derivatives) and other claims to the income generated by real assets - E.g. lease obligations, a $5 bill - Do not directly contribute to the productive capacity of the economy - Defines the allocation of income or wealth among investors - INCLUDED in U.S. household balance sheets - NOT INCLUDED in composition of national wealth ▪ National level aggregates households and firms, so liabilities are cancelled out (houses owe the firms so it cancels out), and there are no financial assets. Only real assets are left. The total amount is the net worth of a country. The larger net worth, the stronger the economy.

Par value:
The par value is the amount that is due to be paid to the bondholder when the bond reaches maturity. It is the face value of the bond and serves as a reference point for determining the bond's interest payments and market value.

Financial Markets

Money market	Capital market
Short-term, marketable, liquid, low-risk debt securities - Money market instruments are also called cash equivalents because assets in money market can be quickly converted to cash - Many securities trade in large denominations (not accessible to individual investors) ○ **Money market funds** are accessible to individual investors ▪ **Mutual funds** invest in money market instruments ▪ **Average maturity** of less than 3 months ▪ **<u>Government money market fund:</u>** invests in treasury securities ▪ **<u>Prime money market fund:</u>** invests in floating-rate commercial paper ▪ **<u>Municipal money market fund</u>**: invests in municipal bonds (free from fed and state tax) ○ See below for money market assets	Longer term, riskier securities - Longer term bond markets ○ **<u>Bond market/fixed-income capital market</u>**: longer term borrowing or debt instruments than those traded in the money market. Most promise either a fixed stream of income or a stream of income determined by a specific formula ▪ **<u>Coupon payments</u>**: Interest payments before maturity, commonly made semiannually ○ See below for bond market assets - Equity markets (stock market) - Derivative markets for options and futures

Major players in the financial market

1. Households are typically net SUPPLIERS of capital
2. Firms are net DEMANDERS of capital
3. Governments can be BORROWERS or LENDERS

Generally, a nonfinancial corporation will have more real assets and liabilities

Financial Institutions

Connect between the security issuer (e.g. firm) and owner of the security (e.g. individual investor)

Examples of Financial Institutions:

- **Financial intermediaries**
  - Banks, investment companies, insurance companies, credit unions
  - Issuers and owners do not need to directly contact each other
  - Assets and liabilities are overwhelmingly financial (real assets make up a much smaller percentage)
  - *Investment companies:*
    - Pool and manage money of many investors
    - Arise out of **economies of scale**: lower brokerage fees and research costs
    - <u>Mutual funds:</u>
      - Have the advantage of large-scale trading and portfolio management
      - Charge a fixed percentage of assets under management
    - <u>Hedge funds:</u>
      - Pursue complex and higher risk strategies
      - Open to institutional investors, keep a portion of trading profits
- **Investment bankers**
  - Issue securities to raise capital for firms. Can act as both a financial intermediary or owners of securities
  - Advise the issuing corporation on the prices of the issued securities, appropriate interest rates, etc.
  - Market the securities in the primary market
    - **<u>Primary market:</u>** new issues of securities are offered to the public
    - **<u>Secondary market:</u>** investors trade previously issued securities among themselves
- **Venture capital and private equity**
  - Invest in smaller and younger firms

Types of securities:
Stocks: Represent ownership in a corporation. When an individual or an institution buys shares of stock, they become a shareh older in the company and are entitled to a portion of the company's assets and profits.

Bonds: Represent a loan made by an investor to a corporation or government. The issuer of the bond promises to pay the invest or a fixed rate of interest and return the principal at maturity.

Options: Give the holder the right but not the obligation to buy or sell an underlying asset at a certain price.

Futures: Contracts to buy or sell an underlying asset at a certain price on a future date.

Swaps: Agreements between two parties to exchange cash flows, typically based on different interest rates or other financial measures.

Forwards: Similar to futures, but traded over-the-counter rather than on an exchange.

Money market instruments: Short-term debt securities issued by governments, corporations, and other entities, such as Treasury bills, commercial paper, and c ertificates of deposit.

Real estate Investment Trusts (REITs): These are securities that allow individuals to invest in income -producing real estate assets such as commercial, residential and industrial properties, without the need to buy or own the properties directly.

ETFs (Exchange Traded Funds): A basket of securities that can track an index, a commodity, bonds, or a particular sector, ETF s are bought and sold on an exchange similar to stocks.

Mutual Funds: A type of investment vehicle made up of a pool of funds collected from many investors for the purpose of invest ing in securities such as stocks, bonds, money market instruments, and similar assets.

Securities

A security is a financial instrument, such as a stock, bond, or option, that represents **<u>ownership in an asset</u>**, such as a company or government, or the right to buy or sell an asset at a certain price. They are traded on financial markets, and can be bought and sold like other assets. They can also be used to raise capital for businesses or governments.

Types of Securities:

- **Fixed income/debt securities:**
  - Fixed income securities are financial instruments that pay a fixed rate of return to the investor. The investor in these securities lends money to the issuer in exchange for regular interest payments and the return of the principal at maturity. The interest rate paid on these securities is usually fixed and the maturity date is known in advance, hence the name fixed income.
  - These securities are issued by companies, municipalities, and governments to raise capital.
  - Types:
    - **<u>Bonds</u>**
      - Long term maturity (e.g. 3 years to 30 years)
      - Usually the risk of the bond is positively correlated with the time to maturity
      -
    - Treasury notes
    - Municipal bonds

Fixed income securities are financial instruments that pay a fixed rate of return to investors over a specific period of time . The main types of fixed income securities are:

Bonds: Represent a loan made by an investor to a corporation or government. The issuer of the bond promises to pay the invest or a fixed rate of interest and return the principal at maturity.

Treasury bonds: Debt securities issued by the U.S. government with maturities of more than 10 years.

Treasury notes: Debt securities issued by the U.S. government with maturities between 2 and 10 years.

Treasury bills: Short-term debt securities issued by the U.S. government with maturities of less than one year.

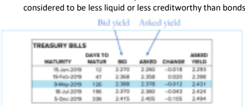
Municipal bonds: Debt securities issued by state and local governments and their agencies to finance public projects such as roads, schools, and water systems.

Corporate bonds: Debt securities issued by corporations to raise funds for business operations.

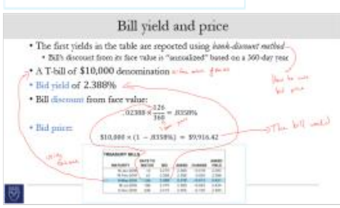
High-yield bonds: Also known as "junk bonds," these are debt securities issued by companies with lower credit ratings, and therefo re pay higher interest rates to compensate for the added risk.

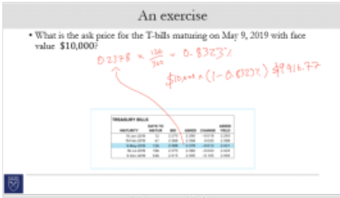
Floating rate notes: Debt securities that pay interest at a rate that varies with a benchmark interest rate such as LIBOR.

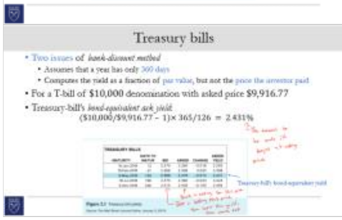
Certificates of deposit (CDs): Time deposits offered by

- **Money Market instruments:**
  - All of these assets are considered to be low-risk, low-return investments, and are often used by investors as a way to park cash or as a safe haven during times of market volatility.
  - Some of these are also fixed income securities but not all
  - Types:
    - **<u>Treasury Bills (T-Bills):</u>** Most common type of money market asset
      - Govt raises money by selling bills to the public, investors buy the bills at a discount from the stated maturity (or face) value, and at maturity, the govt pays the investor the face value of the bill
      - Investor's earnings = difference between the purchase price and the maturity value
      - Most marketable of all money market instruments
      - Issued with initial maturities of 4, 13, 26, or 52 weeks
      - **<u>Ask price</u>**: Price to pay to sell a T-bill from a dealer
      - **<u>Ask yield</u>**: The yield that an investor would receive if they were to sell a bond at the current ask price. The ask price is the lowest price that a seller is willing to accept for a bond. The yield is calculated by dividing the bond's annual coupon payment by the ask price, and then multiplying by 100 to express the result as a percentage.
      - **<u>Bid price</u>**: Price to pay to buy a T-bill from a dealer
      - **<u>Bid yield:</u>** The yield that an investor would receive if they were to buy a bond at the current bid price. The yield is calculated by dividing the bond's annual coupon payment by the bid price, and then multiplying by 100 to express the result as a percentage.
      - **<u>Bid-ask spread:</u>** The difference between ask price and bid price, which is the dealer's source of profit. In general, the bid yield will be lower than the ask yield, because the bid price is usually lower than the ask price. The spread is an indicator of the liquidity of the bond, the creditworthiness of the issuer, or market conditions. Bonds with a wider yield spread are considered to be less liquid or less creditworthy than bonds with a narrower yield spread.
    - 

MATURITY	DAYS TO MATUR	BID	ASKED	CHANGE	ASKED YIELD
15-Jan-2019	12	2.270	2.260	-0.018	2.293
19-Feb-2019	47	2.368	2.358	0.020	2.398
9-May-2019	126	2.388	2.378	-0.012	2.431
18-Jul-2019	196	2.370	2.360	-0.043	2.424
5-Dec-2019	336	2.415	2.405	-0.105	2.494

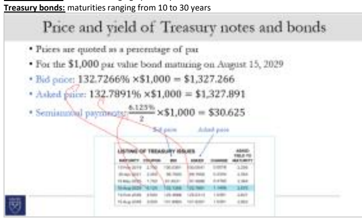






- **<u>Commercial paper (CP):</u>** Short-term unsecured promissory notes issued by corporations to raise funds for working capital or other corporate purposes.
  - Large well-known corporations issue their own short-term unsecured debt notes
  - Often backed by a bank line of credit, which gives the borrower access to cash that can be used to pay off the paper at maturity
  - Maturities range up to 270 days, most often less than 1 or 2 months, usually in multiples of $100k
  - E.g. construction company sources cash via commercial paper to build houses and then sell the homes to pay back commercial paper
- **<u>Repurchase agreements (repos):</u>** Short-term agreements where a financial institution sells securities to an investor with an agreement to repurchase them at a later date at a slightly higher price.
- **<u>Certificates of deposit (CDs):</u>** Time deposits offered by banks and other financial institutions, with maturities ranging from a few days to a year or more.
  - Cannot be withdrawn on demand
  - Treated as bank deposits by the FDIC
  - Insured for up to $250k in the event of a bank insolvency
- **<u>Bankers acceptances (BAs):</u>** Short-term debt instruments issued by banks, typically used to finance trade and other short-term credit needs.
- **<u>Federal funds:</u>** Short-term loans made by banks to each other, typically overnight, to meet reserve requirements set by the Federal Reserve.
- **<u>Municipal notes:</u>** Short-term debt securities issued by municipalities and other local government entities (contrast to municipal bonds which are long-term)

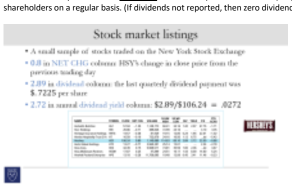
- **Bond Market instruments:**
  - Again some of these are fixed income but not all
  - Types:
    - Issued by U.S. govt and most commonly traded in denominations of $1k:
      - **<u>Treasury notes:</u>** maturities ranging up to 10 years
      - **<u>Treasury bonds:</u>** maturities ranging from 10 to 30 years



- **<u>Municipal bonds:</u>** Debt securities issued by state and local governments and their agencies to finance public projects such as roads, schools, and water systems. These bonds are taxfree at the federal level and in most cases at the state level for residents of the state where the bond is issued.
  - r_taxable = r_muni / (1 - t) where t is the combined federal plus local marginal tax bracket.
  - E.g. if your federal plus state tax bracket (t) is 30%, would you prefer to earn 6% taxable return or 4% tax-free return (the muni bond)?
    - Calculate equivalent 4% taxable yield from the 4% tax -free yield which would be r_taxable = 4% / (1 - 30%) = 0.0571 which is 5.71% which is lower than 6% so you'd want to go for the 6% taxable return instead. ??????
    - Or other way around: If your federal and state tax bracket is 30%, a 6% taxable return would be equivalent to a 4.2% after-tax return (6% x (1 - 0.3) = 4.2%).
  - Cutoff tax bracket is 1 - (r_muni / r_taxable). If investor tax bracket is higher than the cutoff bracket, then muni bond is more appealing. Otherwise, taxable is more appealing.
- **<u>Corporate bonds:</u>** Debt securities issued by corporations to raise funds for business operations. The creditworthiness of the issuer is the main determinant of the bond's risk, and the interest rate offered.
  - Semiannual coupons over their lives and return the face value at maturity
  - Riskier than treasury bonds
  - **<u>Callable corporate bonds</u>**: the firm has the option to repurchase the bond from the holder at a defined call price before maturity. Call price is usually higher than the par value. Usually called when the interest rate is low and the firm can refinance more money at a lower rate.
    In order for the bond to be appealing to investor, they need to be compensated for a higher rate of return
    So usually the callable bond comes with a higher coupon rate/interest rate in order for the holder to be willing to hold such a bond
    Usually the bond holder will get more money before the firm calls back the bond

- **<u>Secured bonds:</u>** secured by a specific asset owned by the owner e.g. real estate
- **<u>Unsecured bonds (debentures)</u>**: backed by general credit rather than by specified assets

- **Common stock or equity:**
  - **<u>Common stock aka equity:</u>** Represents ownership in a corporation.
    - When an individual or an institution buys shares of common stock, they become a shareholder in the company. As a shareholder, they have a claim on a portion of the company's assets and profits, and they also have the right to vote on important matters such as the election of the board of directors.
      - Shareholders elected a board of directors, and the board selects managers, who run the firm on a day to day basis
  - The value of common stock is determined by the market and can fluctuate based on a variety of factors, including the company's financial performance, industry conditions, and overall economic conditions.
  - **<u>Residual claim:</u>** Common stock holders have the last claim on the company's assets, after debtholders, in case the company goes bankrupt or liquidates (equity holder not promised any particular payments). If not in liquidation, they claim to part of the operating income left over after interest and taxes have been paid
  - **<u>Limited liability</u>**: not personally liable for the firm's obligations (unlike mortgages or something)
  - Shareholders may also receive **<u>dividends</u>**, which are a portion of the company's profits paid out to shareholders on a regular basis. (If dividends not reported, then zero dividends)



- Volume: # of shares of the stock
- Market capital (market cap) = # shares of the stock * stock price
  - A measure of the company's total value
- If a stock is split into 2 shares, # shares goes up while stock price goes down. If a stock is worth $2000, it's not good for liquidity because it's very expensive to purchase a share. In many cases, you could only buy an integer number of shares. But on some platforms you can buy a fraction of a share but pay a higher trading cost. So the firm may have some incentives to split the stock. Then the stock price usually goes up in the following days.
- 52 wk high = highest price
  - 52 wk low = lowest price
  - Get a sense of volatility
- Dividend paid to the stockholder. 2.89 is the annual dividend calculated by the dividend paid in the last quarter (in the last quarter, the firm paid 2.89/4 = 0.7225 per share.)
- Yield gives a sense of rate of return from dividend.
  - So it's annual dividend divided by closing price of stock today.
  - Low dividend firms presumably offer greater prospects for capital gains, or investors would not be willing to hold these stocks in their portfolios

- **<u>Price-to-earnings ratio (P/E ratio):</u>** a valuation ratio that compares a company's current stock price to its earnings per share (EPS). It is calculated by dividing the current stock price by the EPS. The P/E ratio is used to measure how expensive a stock is, relative to its earnings. **If not reported, firms have zero to negative earnings.**
  - For example, if a company's stock is trading at $50 per share and its EPS is $5, the P/E ratio would be 10 (50/5). This means that investors are willing to pay $10 for every $1 of earnings that the company generates.
  - A high P/E ratio suggests that investors have high expectations for the company's future earnings,

The bond market is a vast and diverse market, with a wide variety of bond instruments available to investors. Some of the most common types of bond market instruments include:

Treasury bonds: Debt securities issued by the U.S. government with maturities of more than 10 years. These bonds are considered to be among the safest investments, as they are backed by the full faith and credit of the U.S. government.

Treasury notes: Debt securities issued by the U.S. government with maturities between 2 and 10 years.

Municipal bonds: Debt securities issued by state and local governments and their agencies to finance public projects such as roads, schools, and water systems. These bonds are tax-free at the federal level and in most cases at the state level for residents of the state where the bond is issued.

Corporate bonds: Debt securities issued by corporations to raise funds for business operations. The creditworthiness of the issuer is the main determinant of the bond's risk, and the interest rate offered.

High-yield bonds: Also known as "junk bonds," these are debt securities issued by companies with lower credit ratings, and therefore pay higher interest rates to compensate for the added risk.

Floating rate notes: Debt securities that pay interest at a rate that varies with a benchmark interest rate such as LIBOR.

Zero-coupon bonds: Bonds that do not pay periodic interest payments but instead are sold at a deep discount to face value and return the face value at maturity

Inflation-linked bonds: Bonds whose coupon payments and principal are adjusted for inflation.

Foreign bonds: Bonds issued by foreign countries or companies, in their own currency or in US dollars.

Asset-backed bonds: Bonds that are backed by a specific pool of assets such as mortgages, auto loans, or credit card receivables.

These are some of the most common types of bond market instruments, but there are many other types of bonds available for investors to choose from.

while a low P/E ratio suggests that investors have lower expectations. A higher P/E ratio means that investors are paying more for each dollar of earnings, and therefore it is more expensive (rate of return is lower for dividends, Holder is counting on increase in stock price for profit).

    - It is important to note that P/E ratio can vary greatly among companies and industries, and that a high or low P/E ratio does not necessarily indicate whether a stock is overvalued or undervalued. It is also important to consider the company's growth prospects and the overall market conditions when interpreting P/E ratios. Additionally, the P/E ratio doesn't take into account the company's debt, cash balance and other liabilities, so it's not a comprehensive measure of a company's valuation.
  - **Preferred Stock:** promises to pay a fixed amount of income each year
    - No voting power (in contrast to common stock)
    - Priority over common shareholders in event of bankruptcy or liquidation
    - Usually cumulative (unpaid dividends cumulate and need to be paid in full before being paid to holders of common stock)
    - Less risky than common stock but more risky than bonds
    - Similar to an infinite maturity bond
    - No contractual obligation to pay preferred dividends, but they must make interest payments on the debt (see the cumulative bullet point above), also dividends are usually lower than common stock but higher than bonds
  - **Stock weights:**
    - **Price-weighted average:** A price-weighted index is calculated by taking the average price of the securities in the index, with each security's price given equal weight. For example, if an index contains three stocks: A, B, and C, with prices of $50, $100, and $150 respectively, the price-weighted index would be calculated as follows: (50+100+150)/3 = $100. This means that a $1 move in stock B will have the same effect on the index as a $1 move in stock A, regardless of their market capitalization.
    - **Market-value weighted average:** Calculated by taking into account not only the price of each security, but also the number of shares outstanding and the market capitalization of each security. This means that securities with higher market capitalization will have a greater impact on the index.
      Market value weighting average, also known as the market capitalization weighted average, is a method of calculating an index's average stock price by weighting each stock's price based on its market capitalization, which is the stock's price multiplied by its number of outstanding shares.

      The formula for calculating the market value weighted average of an index is:

      Market Value Weighted Average = (sum of (price of stock * market capitalization of stock)) / (sum of market capitalization of all stocks in the index)

      Suppose you have an index with three stocks - A, B, and C - and their respective prices and market capitalizations are as follows:

      Stock A: Price = $50, Market Capitalization = $500,000
      Stock B: Price = $60, Market Capitalization = $600,000
      Stock C: Price = $70, Market Capitalization = $700,000

      To calculate the market value weighted average, you would use the formula as follows:

      Market Value Weighted Average = (($50 * $500,000) + ($60 * $600,000) + ($70 * $700,000)) / ($500,000 + $600,000 + $700,000)

      Market Value Weighted Average = ($25,000,000 + $36,000,000 + $49,000,000) / $1,800,000

    - Equally weighted average
- **Derivatives:**
  - Derivatives are financial instruments that derive their value from an underlying asset, such as a stock, bond, commodity, or currency. They are used to manage risk, as well as for speculation and arbitrage.
  - Examples of derivatives include **options**, which give the holder the right but not the obligation to buy or sell an underlying asset at a certain price, and **futures**, which are contracts to buy or sell an underlying asset at a certain price on a future date. Other types of derivatives include **swaps**, which involve the exchange of cash flows between two parties, and **forwards**, which are similar to futures but are traded over-the-counter rather than on an exchange.
  - Derivatives can be used for a variety of purposes, such as hedging risk, managing cash flow, and generating additional income. However, they can also be complex and risky, and can lead to large losses if not used or understood properly.

Miscellaneous Topics

Fintech and financial innovation:

- Peer to Peer lending: lending to people without a bank (intermediary) like LendingClub
- Cryptocurrencies: payment systems bypass traditional channels such as credit cards, debit cards, or checks, such as bitcoin
- Roboadvisors: automate investment advice

Financial markets and the economy: Financial assets and markets play crucial roles in the developed economy:

1. Information rule
   - Resource allocation through financial markets
     - A higher stock price means it's easier to raise capital for the firm, but may not be most efficient all the time (bubbles)
     - Stock prices reflect investors' collective assessment of a firm's current performance and future aspects
2. Consumption of timing
   - Some individuals earn more than they currently wish to spend
     - In high earning periods, invest savings into financial assets such as stocks and bonds
   - Others (retirees) spend more than they currently earn
     - In low earning periods, sell financial assets to provide funds for consumption needs
   - Shift consumption over the course of a lifetime
3. Allocation of risk
   - Investors can select security types with the risk-return characteristics that best suit their preferences

The investment process

- An investor's portfolio is a collection of investment assets (e.g 20% bonds 80% stocks)
- A portfolio is rebalanced by:
  - Selling/buying securities
  - Adding funds to increase portfolio size
  - Selling securities to decrease portfolio size
- Investors make two types of decisions in constructing their portfolios
  - **Asset allocation:** choose among broad asset classes
  - **Security selection:** choose which securities to hold within each asset class
  - "Top-down" strategy: first asset allocation, then security selection
  - "Bottom up" strategy: first security selection (may heavily represent one industry)

Markets are competitive

- No free lunch: most stocks are priced fairly:
  - Risk-return tradeoff: high risk, high return. The difference between return and expectation is the risk.
  - Efficient markets: security price reflects market consensus of the estimate of the security value
- Choose between two investment opportunities:
  - **Passive management:** holds highly diversified portfolios without attempting to improve investment performance through security analysis
    - No arbitrage
    - Used by mutual funds
  - **Active management:**