
ECN 135 Lecture 12

Money, Banks & Financial Institutions

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Plan for today

- Midterm format
- Review for Midterm
 - LTCM case, question 2 (about John Meriwether new hedge fund)
 - Money: related concepts & theories
 - Asymmetric information & financial intermediation
 - Bonds & their prices, yield curves
 - Models of stock valuation
 - Nonlinear securities & their valuation

Format of the Midterm

- Max Total Score of 100 [+ bonus of 5]
- Question 1 consists of 25 multiple choice questions on chapters 1, 2, 3, 22, 4, 6, 7, 8, 13. Each question weights 1.5 points (max 37.5 points total)
- Similar to multiple choice questions from HA1 & midterm practice
- Question 2 has numerous sub-questions. It is on hedge funds (LTCM / Meriwether) (max 22.5 points total)
- Questions 3 in about bonds & taxes (max 5 points)
- In questions 4 - 8 you pick only ONE [A or B]. Each question weights max 5 points. You choose A or B (but NOT both)
- Question 9 is about stock valuation
- Bonus is the challenge. It asks you to apply class material to some unexpected question. [bonus max 5 points]

Multiple Choice Questions

- Inflation, money supply & theories of money demand (Keynes & Fisher), money measures (M1, M2...), evolution of money (defining money & financial innovation), nominal/real values, velocity of money, direct/indirect finance, financing via external/internal funds, money market/capital market, asset liquidity (relative liquidity if different assets), asset diversification, bonds & their pricing (consols, face value of the bond, price dependence on interest rates & probability of default), Treasury Inflation Protected Securities (TIPS), yield curves, asset valuation, financial securities (futures & options (put/call & European/American) & their pricing, exercise price, swaps)

Some Definitions

- Stock is a share of ownership of the corporation [M] p. 5 (equity securities)
 - A. Primary Market
New security issues sold to initial buyers
 - B. Secondary Market
Securities previously issued are bought and sold
- Bond is a debt security promising to make periodic payments for a specified time period [M] p. 3 (debt securities)
 - Money Market [M] p.27
 - Short-term (maturity < 1 year) [M] p.26
 - Capital Market [M] p.27
 - Intermediate term (maturity > 1 year & < 10 years) [M] p.26
 - Long-term (maturity > 10 years) [M] p.26
- Markets
 - Bond Market (interest rates are determined)
 - Stock Market (major effect on people's wealth & firms' investment decisions)
 - Foreign Exchange Market (ForEx fluctuations have major consequences for the US economy)
- All else equal, equity is more volatile than debt

More Definitions

- **Distinction Between Nominal and Real**
 - Nominal = values measured using current prices
 - Real = quantities, measured with constant prices
- **Aggregate Price Level**
 - GDP Deflator= $\text{Nominal GDP} / \text{Real GDP}$
- Consumer Price Index (CPI) is a price of a "basket". The "basket" is a list of goods & services bought by a typical urban household.
- Transaction costs - time & effort spend to exchange goods & services
- Financial Intermediation helps to channel funds between borrowers & lenders. FI reduces transaction costs (& improves economic efficiently) External finance is subdivided on
 - Direct finance (via financial markets) (US: stocks 10%, bonds 35%)
 - Indirect finance (via financial intermediaries (FI)) (funds raised by businesses directly from FI) (even in US > 55%, and more in other countries) (US: 40% bank loans, Germany, Japan > 80% bank loans)
 - → Indirect finance is more important (higher share) than direct finance
- FI help lowering transaction costs (risk sharing & asymmetric information)

Financial Markets & Information

- Concepts related to asymmetric & incomplete information
- **Adverse Selection** (Before transaction occurs)
 - Potential borrowers most likely to produce adverse outcomes are ones most likely to seek loans and be selected
 - **Lemon Problem** in financial markets (or adverse selection in financial markets)
- **Moral Hazard** (After transaction occurs)
 - Hazard that borrower has incentives to engage in undesirable (immoral) activities making it more likely that won't pay loan back
 - **Principal agent problem** is a special case of moral hazard **ownership (investors)** and **control rights (CEO & management)** are separated
 - **Moral hazard is present in both, debt & equity markets to resolve:**
 - Monitoring & restrictive covenants
 - Regulations (to provide more information)
 - Financial intermediation
 - Debt contracts & net worth
- Agency problem / conflict = combination of principal agent problem & free riding problem
- But private provision of information is hindered by
 - **Free riding** problem is use of information for which others paid
 - **Agency Conflict**
 - if outcome (profit) depends on many parties / participants, losses due to agency conflict increase with the number of parties due to their free riding
 - for example: Buffett and Co. (3 members) expected to get a higher LTCM liquidation value than Consortium did (16 members)

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Definition Agency problem is **conflict of incentives** of relevant market participants (players). The conflict occurs when the actions that maximize player joint profit and the actions that maximize the private profit of each specific player **differ**.

Money: Theories & Concepts

- Money - 1. medium of exchange, 2. unit of account, 3. store of value
 - 1. Precious metals like gold and silver
 - 2. Paper currency (fiat money)
 - 3. Checks
 - 4. Electronic means of payment
 - 5. Electronic money: Debit cards, Stored-value cards, Smart cards, E-cash
 - Pros: savings on paper checks' cashing
 - Cons:
 - costs of setting up electronic payment system
 - Privacy & security concerns
 - Anti-fraud enforcement system
- Importance of liquidity - how fast could be converted into medium of exchange
- Velocity of money $V = PY/M$ (total spending divided by quantity of money)
- Quantity of Exchange $M \times V = P \times Y$
- Theories
 - Classical (Fisher): $M^d = k \times PY$, where $k=1/V$
 - Keynes: motives to hold money: 1. transaction, 2. precautionary, 3. speculative $M^d/P = f(i, Y)$
 - $V = PY/M = Y/f(i, Y) \rightarrow$ **In Keynes Theory: Velocity is not constant**
 - Neoclassical (Friedman): $M^d/P = f(Y_p, r_b, r_m, r_e, \pi^e, r_m)$
 - M^d is a stable function (Y_p fluctuates less than Y) \rightarrow **velocity is predictable**
- Measures of money (or money supply) (or Federal reserves aggregates) Lecture 4, slide 5 & Table 1, [M] p. 53, M1 - the narrowest, M3 - the widest measures. Change with technology
 - M1=currency + traveler's checks +demand (& other checkable) deposits
 - M2=M1 + small-denomination time deposits + repos + savings (& money-market) deposits + money-market funds shares (non-institutional)
 - M3=M2 + large-denomination time deposits + repos + Eurodollars + money-market funds shares (non-institutional)

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M^d/P — demand for real money balances

Y_p — Friedman's measure of permanent income

π^e — expected inflation rate

r_b, r_m, r_e — expected returns on bonds, money and equity (common stock)

Hedge Funds

- Hedge funds are special mutual funds engaging in money-neutral strategies
- John Meriwether (JWM) profit comes from two sources
 - Management fee of 2 percent of assets annually
 - Performance fee of 20 percent of profits
- 2 possible scenarios:
 - A. If M. does nothing → capital is \$350 million to \$400 million, target returns 15-20%
 - Max Profit (A) = $400 \times 0.02 + 400 \times 0.2 \times 0.2 = \24 million
 - B. If M. promises to be more conservative (leverage ratio 10:1 instead of 30:1 in LTCM, & target return of 15%) → to reach the target capital level of \$1000 million.
 - Min Profit (B) = $1000 \times 0.02 + 0.2 \times 0.05 \times 1000 = \30 million
 - It pays off for M. to be conservative!

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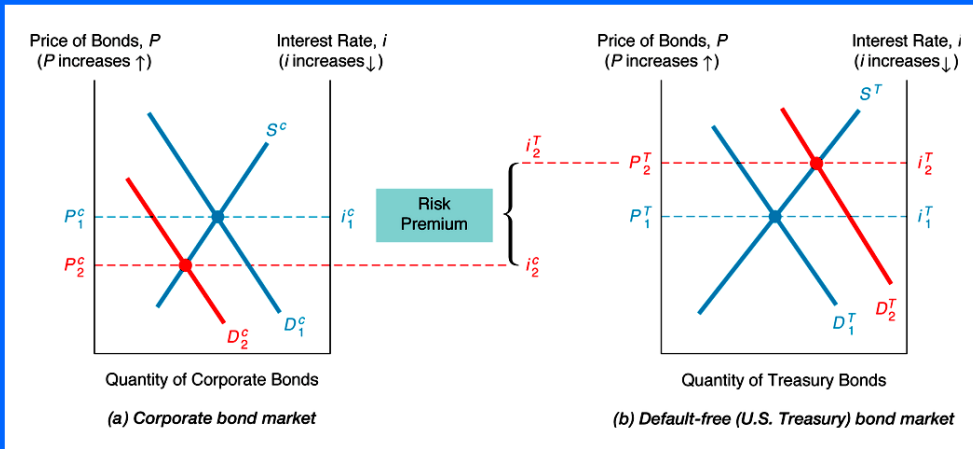
Hedge: engage in a financial transaction that reduces or eliminates risk.

Basic principal of hedging is offsetting the risks.

Question: Do hedge funds entail risk?

Answer: Yes, and substantial. Hedge funds are largely unregulated entries.

Bonds: Demand & Supply of Corporate & Treasury Bonds



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Increase in Default Risk on Corporate Bonds [M] p. 122

Please, notice that interest rate increases DOWN. Remember that in other diagrams in Chapter 6.

Risk of default occurs when issuer of the bond is unable or unwilling to make interest payments when promised (or face value when bond matures)

Analysis of Default Risk Increase

- **Corporate Bond Market**
 - 1. R^e on corporate bonds \downarrow , D^c (demand) \downarrow , $\rightarrow D^c$ shifts left
 - 2. Risk of corporate bonds \uparrow , $D^c \downarrow$, D^c shifts left
 - 3. Corporate bond Price $P^c \downarrow$, interest on corporate bond $i^c \uparrow$
- **Treasury Bond Market**
 - 4. Relative R^e on Treasury bonds \uparrow , D^T (demand) \uparrow , $\rightarrow D^T$ shifts right
 - 5. Relative risk of Treasury bonds \downarrow , $D^T \uparrow$, D^T shifts right
 - 6. Treasury bond Price $P^T \uparrow$, interest on treasury bond $i^T \downarrow$
- **Outcome:**
 - Risk premium, $i^c - i^T > 0$, rises
- Default risk is always positive for corporate bonds
- When default risk raises, risk premium raises

Generalized Dividend Valuation Model

- Valuation:

- 1. Generalized Dividend Valuation Model
- 2. Gordon model of stock valuation

$$P_0 = \frac{D_1}{(1+k_e)^1} + \frac{D_2}{(1+k_e)^2} + \dots + \frac{D_n}{(1+k_e)^n} + \frac{P_n}{(1+k_e)^n} \quad (2)$$

- Since last term of the equation is small, [2] can be written as

$$P_0 = \sum_{t=1}^{\infty} \frac{D_t}{(1+k_e)^t} \quad (3)$$

Gordon Growth Model or Gordon Model of Stock Valuation

- Gordon model assumes
 - 1. constant dividend growth
 - 2. The dividend growth rate is less than the required return rate
- 1. With constant dividend growth (g), Eq. [3] can be written as

$$P_0 = \frac{D_0 \times (1+g)^1}{(1+k_e)^1} + \frac{D_0 \times (1+g)^2}{(1+k_e)^2} + \dots + \frac{D_0 \times (1+g)^\infty}{(1+k_e)^\infty} \quad (4)$$

- 2. When the growth rate is less than the required return on equity, Eq. [4] ([M] p. 143) can be written as

$$P_0 = \frac{D_0 \times (1+g)}{(k_e - g)} = \frac{D_1}{(k_e - g)} \quad (5)$$

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P_0	=	the current stock price
D_1	=	the next period's dividend
k_e	=	the required rate of return
g	=	the dividend growth rate

D_0 is the most recent dividend paid

Myron Gordon Model assumes that $g < k_e$

(But if this assumption does not hold, the firm should grow impossibly large)

Options

- **Options Contract**
- Right to buy (call option) or sell (put option) instrument at exercise (strike) price up until expiration date (American) or on expiration date (European)
- **Hedging with Options**
- Buy same # of put option contracts as would sell of futures
- *Disadvantage:* pay premium
- *Advantage:* protected if $i \uparrow$, gain if $i \downarrow$

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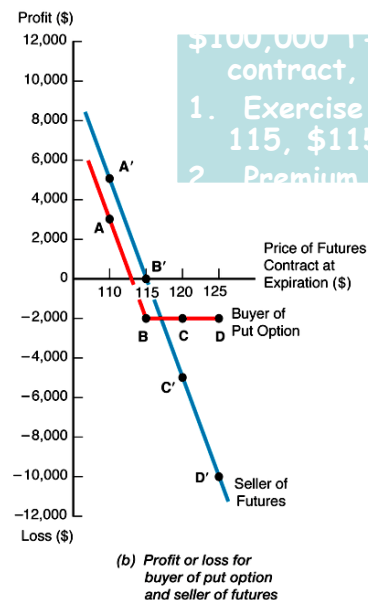
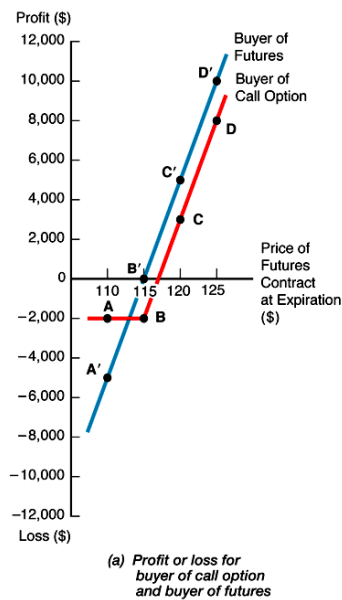
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Option

Gives the buyer the right, but not the obligation, to buy or sell an asset at a set price on or before a given date. Investors, not companies, issue options. Buyers of call options bet that a stock will be worth more than the price set by the option (the strike price), plus the price they pay for the option itself. Buyers of put options bet that the stock's price will drop below the price set by the option. An option is part of a class of securities called derivatives, which means these securities derive their value from the worth of an underlying investment.

Profits & Losses: Options vs. Futures



\$100,000 T-bond contract,
 1. Exercise price of 115, \$115,000.
 2. Premium = \$2,000

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Futures: linear expected returns, but more risk than for options

Buyer of the Future MUST buy

Buyer of call option has a right to buy (but NO obligation)

Options: non-linear returns, but less risky (there is a lower bound for a loss, which is equal to premium)

Factors Affecting Premium

- 1. Higher strike price (price of delivery in option contract) \Rightarrow lower premium on call options and higher premium on put options
- 2. Greater term to expiration \Rightarrow higher premiums for both call and put options (similar to yield curves & interest rate premium increase for bonds with longer maturities)
- 3. Greater price volatility of underlying instrument \Rightarrow higher premiums for both call and put options

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Importance of volatility that is implied when option price is calculated. If volatility is higher (by 5% or by 20%) than others use in calculations, option price can be inflated. This is possible to inflate prices due to presence of transaction costs, and informational & market imperfections.

Margin requirement A performance bond paid upon purchase of a futures contract that protects the exchange clearinghouse from loss.

Next Lecture

- Next lecture is your MIDTERM
 - Review material your midterm
 - Repeat / reread [M]:
 - Ch. 1, 2, 3, 22, 4, 6, 7, 8, 13
- After the midterm (next Tuesday lecture)
 - Your preparation: read [M] Ch 14

Summary of Today

- Review of Material for the Midterm
 - Midterm structure
 - Financial Markets and information
 - Hedge funds & their policies
 - Bonds & their pricing
 - Valuation models
 - Non-linear Securities & their pricing
- Have a Nice Night