

Finance 462
Outline for Midterm #1

I: An overview of the Financial System (S/B Chapter 1)

What issues do financial markets deal with? Why is an efficient financial important for an economy? Who are the main players? What are the types of assets bought/sold?

- **Financial markets allow for the efficient transfer of resources from savers to borrowers. This is important for two reasons:**
 1. Consumers are given more flexibility in terms of how they choose to spend their income (i.e., consumption is not no longer restricted to be equal to income every period)
 2. Resources are made available for firms to invest in new capital equipment (recall that capital formation is the basis for long run growth).

- **A Good Financial System Provides Three Primary Services**
 1. Low Cost Diversification (risk sharing)
 2. Liquidity (easy conversion of assets into cash)
 3. Information

- **The Financial System in General (and Banks in Particular) Must Deal With the problem of Asymmetric Information**
 1. Moral Hazard
 2. Adverse Selection

II: Measuring the Economy (S/B Chapter 2)

We are barraged each month with economic data. Each indicator is designed to measure some aspect of the US economy. You should have an understanding of where these numbers come from, how they are calculated and what they mean. The key indicators are as follows

- **GDP** measures an economy's total production (at current market value) over a certain period. The biggest problem here is avoiding *double counting*. That is, if one firm's output is used as an input of another firm, we don't want to count it twice.
- **Employment, the unemployment rate and duration.** These are the three main components of the monthly employment report. This measures how many people are working, how many are not, and what the average length of unemployment is. The difficulty here is capturing a market as dynamic as the US labor market using a handful of numbers.
- **The Consumer Price Index and the GDP deflator:** These two price indices are attempting to capture the average price of goods and services in the US. The primary difference between them is that the CPI is a *fixed weight index*. That is, the CPI measures the cost of the same basket of goods over time. The GDP deflator is a

variable weight index. Therefore, the basket of goods in the index changes over time to reflect changing consumption patterns.

- **Productivity:** Productivity measures our ability to turn inputs (capital and labor) into output. The two main indicators are labor productivity (output per hour) and multifactor productivity. Essentially, MFP corrects for adjustments to the capital stock while labor productivity does not.

III: Understanding Interest Rates (S/B Chapter 4)

We use interest rate models to predict future movements in interest rates. These models are calibrated to match key empirical properties of interest rates

- Interest rates are mean reverting (i.e. they have a constant long run average)
- Interest rates are very volatile – Long term rates are less volatile than short term rates (large variance)
- Interest rates have a lot of persistence (high autocorrelation)
- Interest rates are highly correlated with each other.
- Interest rates are procyclical (positively related to output)
- Interest rates are negatively correlated with money growth in the short run, but positively correlated in the long run.

IV: Forecasting Interest Rates (Economic Models): S/B Chapter 3

Economic models try to predict the distribution of future interest rates using observations of other variables in the economy. These models make behavioral assumptions to explain how volatility in underlying economic fundamentals is passed on to interest rates. While there are many variations, they all have the same basic pieces:

- Financial markets allow households to separate spending patterns from income. Therefore, households take (expected) lifetime income and interest rates as given and choose a pattern of consumption to maximize utility. This results in two restrictions:

$$\text{Marginal Utility of Current Consumption} = (1+r) \text{ Marginal Utility of Future Consumption} \quad (\text{Optimality})$$

$$\text{Present Value of Lifetime Consumption} = \text{Present Value of Lifetime Income} \quad (\text{Affordability})$$

Where Marginal Utility is the derivative of utility with respect to current/future consumption. The above restrictions define a savings curve (the relationship between savings and interest rates).

- Firms are choosing capital expenditures to maximize shareholder value (present value of lifetime profits). The results in one restriction:

$$\text{Marginal Cost of Investment (Price of Capital)} = \text{Present Value of lifetime marginal impact of new investment (MPK) over}$$

The above restriction defines an investment curve.

- Households (suppliers of credit) and Firms (demanders of credit) interact in the marketplace and the interest rate adjust so that the market clears ($S = I$).
 - Adding a Government: $S = I + (G-T)$
 - Adding Monetary Policy (Liquidity Effects vs. Anticipated Inflation Effects)

V: Statistical Models (S/B Chapters 5,7)

- **Statistical Models attempt to explain future interest rate behavior through past interest rate behavior. Specifically, statistical models are constructed to replicate the behavior of the yield curve (the dynamics of forward rates are modeled to fit the slope of the yield curve as well as various statistics such as mean, variance, autocorrelation)**
- **Finite Methods (Lattice) assume that each period, the interest rate has finite number of possible paths each period.**
 - **Binomial Methods**
 - **Trinomial Methods**
- **Continuous models assume an infinite number of possibilities each period. The typical form is**

$$dr = a(r, t)dt + \sigma(r, t)dz$$

The first term (dt) governs the mean while the second term governs the variance.