Portfolio Theory

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Lecture 1

Content:

- The corporation and the financial market
- Interest rates

The corporation and the financial market

The corporation is a legal entity separate from its owners (i.e., the latter are not liable for the obligations of the former, and vice versa).

The ownership is divided into **shares**. The set of shares owned by an investor is called “stock”, but these terms are often used interchangeably to indicate shares.

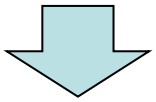
The collection of all the outstanding shares of a corporation is known as the **equity** of the corporation.

The corporation and the financial market

The owners can profit from:

- dividends payment;
- capital gain.

The direct control of the corporation is held by the board of directors and the CEO.



Agency problem

These issues are dealt with by *corporate governance*.

The corporation and the financial market

Some or all the shares of a corporation can be privately held, and they are traded on private markets.

A company can go public via an **Initial Public Offering (IPO)**.

Publicly traded stocks are traded on the **stock market**.

Primary market: where new shares are first issued.

Secondary market: where existing shares are traded.

Security: an investment opportunity (like shares, or any other asset) that trades in a financial market.

The corporation and the financial market

Liquid stocks can be easily converted into cash without affecting its market price. This allows for flexible investments and efficient pricing of the investment.

Bid-ask spread: the difference between the price at which it is possible to buy the stock (bid price) and the price at which it is possible to sell the stock (ask price).

Bid price is always higher than ask price, but this spread is small if the market is liquid.

The corporation and the financial market

Market makers are intermediaries that quote both a buy and a sell price to profit on the bid-ask spread. They increase the liquidity.

Limit order book: the collection of all limit orders (orders to buy or sell a set amount at a fixed price). They provide liquidity.

Short selling: selling a security you do not own by borrowing it and returning it to the owner at a later date.

The corporation and the financial market

Trading securities implies facing **transaction costs**:

- the commissions paid to the broker
- the bid-ask spread

Arbitrage: the practice of buying and selling equivalent goods in different markets to profit from a price difference.

Arbitrage keeps the prices of equivalent goods and securities close to each other: prices cannot deviate more than the transaction costs of the arbitrage.

These and other issue are studied by a branch of finance called *market microstructure*.

Interest rates

Time value of money: the difference in value between money today and money in the future.

Interest rate: The rate at which we can exchange money today for money in the future

Risk-free interest rate (R_f): the rate at which money can be borrowed or lent without risk over a certain period.

Taxes reduce the amount of interests the investor can keep.

Given a tax τ, the **After-Tax Interest Rate** is:

$$R - (\tau R) = R(1 - \tau)$$

Interest rates

Discount Rate Period Conversion. We can convert a discount rate of *R* for one period to an equivalent discount rate for *n* periods using the following formula:

Equivalent n-Period Discount Rate = $(1 + R)^n - 1$

- $n > 1$ to compute a rate over more than one period
- $n < 1$ to compute a rate over a fraction of a period

Example. The annual rate is 5%. What is the monthly rate?

$$(1 + 0.05)^{1/12} - 1 = 0.004074 = 0.4047\%$$

The monthly rate is 0.5% What is the annual rate?

$$(1 + 0.005)^{12} - 1 = 0.061678 = 6.1678\%$$

Interest rates

Nominal interest rate (*R*): the rate at which the money will grow if invested for a certain period

Real interest rate (R_r): the rate of growth of the purchasing power, after adjusting for the inflation rate i.

$$R_r = \frac{1 + R}{1 + i} - 1$$

Nominal interest rates tend to move with inflation.

Interest rates affect firms' incentive to raise capital and invest. Central banks influence them based on the state of the economy and the inflation rate.