Lesson 6 Guide

Lesson 6: Saving and Investment

Firm's Decision

Firms have to make a decision about what to use their resources for. There are two things that firms use their resources for.

1. Pay dividends to stock holders
2. Increase capacity to produce more in the future (I)

Firms will choose a level of capital (K) that maximizes profit by reaching the condition $MB = MC$

MB = Expected marginal product of capital (MPK^e)

MC = User-cost of capital (UC)

π_{max} when UC = MPK^e

User Cost

We will express user cost in number of output, which is the real cost.

Example: Michael Scott's Paper Company

- Output: Reams of Paper (Price = \$10)
- Capital: Van (Price = \$10,000)
- UC = 1,000 reams of paper

User Cost Factors

User Cost depends on:

- Real Price of capital (P_k)
- The depreciation rate (δ)
- The real interest rate (r)
- The business tax on revenue (τ)
- Investment Tax Credit (ITC)

Defining User Cost

Start without considering taxes or tax credits

$\frac{w}{\tau} = 0$ and $ITC = 0$

$$UC = rP_k + \delta P_k$$
$$UC = (r + \delta)P_k$$

Now lets add in τ (business tax on revenue) Firms will now be losing some % of their benefit (revenue) MPK^e

At max π:

$$UC = MPK^e - \tau MPK^e$$

$$UC = (1-\tau)MPK^e$$

$$\frac{(r+\delta)P_k}{1-\tau} = \frac{(1-\tau)MPK^e}{1-\tau}$$

$$MPK^e = \frac{(r+\delta)P_k}{1-\tau}$$

$$UC = \frac{(r+\delta)P_k}{1-\tau}$$

Now let us add in Investment Tax Credit (ITC). Assume ITC is a % of P_k (real price of capital)

$$P_k = P_k - ITC(P_k)$$

$$P_k = (1-ITC)P_k$$

Plug this into our user cost we get:

$$UC = \frac{(r+\delta)(1-ITC)P_k}{(1-\tau)}$$

Shifts in User costs

1. Increase in r is increase in UC
2. Increase in δ is increase in UC
3. Increase in ITC is decrease in UC
4. Increase in P_k is increase in UC
5. Increase in τ is increase in UC

Defining Marginal Benefit MPK^e