Exercise session #6 - Solow model I.

Problem 1 - Growth accounting; D-F 73/1   In a simple scenario with only 2 factors of production, suppose that capital share of income is 0.4 and labor's share of income is 0.6 and that annual growth rates of capital and labor are 6 and 2 percent, respectively. Assume there is no technical change.

1. At what rate does output grow?

2. How long will it take for output to double?

3. Now suppose technology grows at rate of 2 percent. Recalculate your answers to 1 and 2.

Problem 2 - Solow model; D-F 73/7

Consider the following production function: $Y = K^{0.5}(AL)^{0.5}$ where both the population and the pool of labor are growing at a rate $n = 0.07$, the capital stock is depreciating at a rate $\delta = 0.03$ and A is normalized to 1 and growing at the rate of $g = 0.01$.

1. What are the capital's and labor's shares of income?

2. What is the form of this production function?

3. Find the steady-state values of k and y when $s = 0.2$.

4. At what rate is per capita output growing at the steady state? At what rate is total output growing? What if the total factor productivity (A) is increasing at a rate of 2 percent per year ($g = 0.02$)?

Problem 3 - Solow model; H 226/2
Assume production function featuring constant returns to scale and dimishing returns to capital

1. If there is no population or technological growth, what will be the growth rate of output and the growth rate of output per worker in the steady state?

2. If the population growth rate is 0.2% and there is no technological growth, what will be the growth rate of output and the growth rate of output per worker in the steady state?

3. If the population growth rate is 0.2% and technological growth rate is 3%, what will be the growth rate of output and the growth rate of output per worker in the steady state?

Questions for review:

Lecture 6: Solow model I

- Describe the structure of labor market in the classical competitive market. What determines labor demand? What determines labor supply? Is there any space for involuntary unemployment?

- Explain the model of natural level of unemployment. Explain the flow equation in the labor market sE = fU. How is the natural rate of unemployment determines

- What is the main underlying cause of frictional unemployment? State three reasons for existence of search and matching frictions in the labor market. What are the main public policies targeting frictional unemployment? Give examples from your own country.

- What is the main underlying cause of structural unemployment? Give an example of sectoral shift that affected employment in your country.

- What is the main underlying cause of classical unemployment? Describe the effects of minimum wage law on the level of unemployment. What are the incentives for firm to pay higher than equilibrium wage - i.e. efficiency wage? What do you understand under adverse selection in the context of efficiency wages argument? What do you understand under moral hazard in the context of efficiency wages argument?

- What is the main underlying cause of seasonal unemployment? How can we affect it?

- What is the main underlying cause of cyclical unemployment?

- Compare the duration of unemployment spell in the Czech Republic (e.g. compared to USA)? What implications does it have on the government policies against unemployment?

- What can you say about the problem of youth unemployment in the European context?