

## Seminar 11.

**Task 1.** The country is home to 45 million people, which can be divided into 5 groups, the main characteristics of which are presented in the table:

Group	Group size in%	Propensity to work, $\alpha$	Rent income, $r$	Limit of physical capabilities, $d$
1	0.4	0.5	0	400
2	0.2	0.4	500	325
3	0.3	0.6	2000	260
4	0.07	0.4	5000	336
5	0.03	0.3	15000	410

- a) Given the known tax rate on non-rental income  $\gamma = 15\%$  and the minimum subsistence level  $a = 450$ , determine the function of labour supply in the country.
- b) Based on the solution a) determine how the function of labour supply will change when changing the tax rate to  $\gamma = 16\%$ .
- c) Based on the solution a) determine how the function of labour supply will change when the subsistence level increases to  $a = 480$ .

**Task 2.** The function of labour demand in a country  $D_L = A - Bw$ , where  $D_L$  is the number of millions of hourly workers at the payment rate  $w$ . All workers (25 million people) determine the individual supply of labour, based on the welfare function of Stone with the  $\alpha = 0,5$  and parameters  $d = 16$ ,  $r = 10$ .  $a = 100$  Determine at what tax rate the state maximizes tax revenues to the budget.

**Task 3.** Demand for goods  $Q_D = 350 - 2p$ , supply  $Q_S = 7p$ . The state imposes a tax  $t$  for each unit of goods sold. Determine at what value  $t$  budget revenues are maximized.

**Task 4.** Demand for goods  $Q_D = 565 - 4p$ , supply  $Q_S = -20 + 3p$ . The state introduces a subsidy in the amount  $t$  of each unit of goods sold. Determine at what value  $t$  producers receive the maximum total amount of subsidies.

**Task 5.** In the market, the functions of supply  $Q^D = 7 - p$  and demand are defined  $Q^S = -2 + 2p$ . The state introduced a tax of 1.5 USD per unit. Determine the equilibrium price, the amount of output, and the amount of tax going to the state treasury.

**Task 6.** The function of public demand  $Q_D = 9 - P$ , the supply function  $Q_S = 6 + 2P$ , where  $Q_D$  - volume of demand, million units;  $Q_S$  - supply volume, million units;  $P$  - price in coins. Let a non-commodity tax be paid by the seller in the amount of 1.5 coin/unit. Determine the equilibrium price and the equilibrium sales volume.

**Task 7.** The demand function is  $Q_D = 20 - P$ , the supply function  $Q_S = 15 + 3P$ , where  $Q_D$  - the volume of demand, million units;  $Q_S$  - supply volume, million units;  $P$  - price in coins. Suppose the state has introduced subsidies for this product in the amount of 1 coin/unit. Determine the equilibrium price and the equilibrium sales volume.

**Task 8.** The cigarette market is represented by the following supply and demand functions  $Q^D = 36 - 2P$ ,  $Q^S = -4 + 3P$ . What is the maximum amount of tax that can be collected from this market by levying excise duty on each pack of cigarettes sold? Determine the form of the Laffer curve.