

Problem #1 (2 points)

The utility function of a typical employee of a certain company owned by the State Treasury can be approximated by the formula $U(C,R) = C^{1/3}R^{2/3}$. This employee can devote 460 hours a month to work and leisure. The wage in this company amounts to 10 *zloty* per hour. There are no social payments.

- a) Calculate, how many hours a typical employee of this company will work and how many hours he/she will devote to leisure.
- b) Due to the recently incurred losses the company is going to be closed down. In order to prevent social protests a typical employee will receive an unemployment benefit at a level ensuring that he/she will be indifferent between becoming unemployed and working. Determine the minimum benefit level for which the typical employee will agree to become unemployed.

Problem #2 (2 points)

The sudden increase in criminality has become a serious social problem. Many criminals are motivated by economic incentives. In terms of microeconomics the life of a criminal consists of two periods: the period when he/she commits a crime (t_1) and the period when he/she “consumes” the goods acquired from the crime (t_2). A typical criminal’s income is $M_1 = 20\,000$ *zloty*, while in the second period he/she has no income. An alternative solution for this person is permanent employment yielding identical annual income $m_1 = m_2$ in both periods.

- a) How high must such income be in order to guarantee the nonexistence of financial incentives for committing a crime? Assume that the real interest rate for savings between period t_1 and t_2 amounts to 30%. Obviously income earned illegally cannot be deposited at the bank and, therefore, the real interest rate in such case amounts to -20% . For simplicity assume that income is acquired at the end of the year.
- b) Intertemporal preferences of a potential criminal can be approximated by function $U = c_1c_2$, where c_1 – consumption during the first period and c_2 – consumption during the second period. If permanent employment brings him/her 10 000 *zloty* per year will he/she decide to commit a crime?

Problem #3 (2 points) /concerns Uncertainty – the topic for class on 20/01/

During his trip around the world Mr. Explorer is planning to spend USD 10 000. His utility from the trip depends on how much he spends on it in the following way: $U(Y) = \ln Y$, where Y is the amount spent on the trip. He may lose USD 1000 before the trip with a probability of 30%, therefore he is considering to fully insure himself against this loss. Find the “fair” insurance premium. Will Mr. Traveler buy insurance if he is offered it at the “fair” premium?