Practical Session II

Redistribution and fair allocation

1. Consider the Utilitarian social welfare function and the Rawlsian social welfare function.

   a. Which one is more consistent with a government that redistributes from rich to poor? Which is more consistent with a government that does not do any redistribution from rich to poor?

   b. Think about your answer to 1a). Show that government redistribution from rich to poor can still be consistent with either of the two social welfare functions.

2. The country of Adventureland has two citizens, Bill and Ted. Bill has a private legal business. He earns 50 per hour. At a tax rate of 0%, Bill works 20 hours. At a 25% tax rate he works only 16 hours, and at a 40% tax rate he works only 8 hours per week. Ted works a manufacturing job. He works 20 hours per week and earns €6 per hour, regardless of the tax rate. The government is considering imposing an income tax of either 25% or 40% on Bill and using the revenues to make transfer payments to Ted. The accompanying table summarizes the three possible policies. Does either tax policy raise social welfare? Is either of the policies obviously less than optimal? Explain your answers.

Effects of Redistributive Policies in Adventureland			
	0%	25%	40%
Bill's Pre-Tax Income	1,000 €	800 €	400 €
Bill's Taxes	0 €	200 €	160 €
Bill's Net Income	1,000 €	600 €	240 €
Ted's Pre-Tax Income	120 €	120 €	120 €
Ted's Transfer Payment	0 €	200 €	160 €
Ted's Net Income	120 €	320 €	280 €

3. Now, suppose that Bill and Ted have the same utility function $U(Y) = Y^{1/2}$ where Y is consumption (which is equal to net income).

   a. Rank the three tax policies discussed in the previous question for a utilitarian social welfare function. Rank the three for a Rawlsian social welfare function.

   b. How would your answer change if the utility function was instead $(Y) = Y^{1/5}$?

c. Suppose that Bill and Ted instead have different utility functions: Bill's utility is given by $U_B(Y) = 0{,}25Y^{1/2}$, and Ted's is given by $U_T(Y) = Y^{1/2}$. (This might happen, for example, because Bill has significant disabilities and therefore needs more income to get the same level of utility.) How would a Rawlsian rank the three tax policies now?

4. Any point along the Utility Possibility Frontier is equally desirable from a social point of view. Comment.

5. Consider the classical setting with 2 agents and 2 goods, where preferences are monotonic and convex.

   a. Are efficiency and no-envy compatible?

   b. Is there a logical connection between no-envy and equal treatment of equals?

   c. If an allocation is envy-free, does it need to satisfy no-domination?

6. Consider the classical setting with 2 agents and 2 goods, where the goods are perfect substitutes for both agents.

   a. Show (in an Edgeworth box) the set of envy-free and efficient allocations.

   b. Show (in an Edgeworth box) the set of efficient allocations that also satisfy the equal division lower bound.

   c. Compare your answers to a) and b).

7. Consider the classical setting with 2 agents and 2 goods, where the goods are perfect complements for both agents (who have Leontieff preferences).

   a. Show (in an Edgeworth box) the set of envy-free and efficient allocations.

   b. Show (in an Edgeworth box) the set of efficient allocations that also satisfy egalitarian equivalence.

   c. Compare your answers to a) and b).