

LECON2112 Advanced Microeconomics II

– Assignment 10 –

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Deadline: Monday, May 6, 2024 at 5pm.

Instructions: To be submitted via Moodle as a single file (including your name and NOMA).

Exercises¹

11Ba. We have two agents (1 and 2). We also have two goods, one private good in which both have an endowment (w_1 and w_2 , respectively) and pollution. Their utility functions are $u_1 = x_1 + -(h - 5)^2$ and $u_2 = x_2 - h$ where x is the amount of the private good they enjoy and h the amount of pollution they experience. 1 is the one choosing the level of h .

(b) Let's now say that we have a market for h . To produce a unit of h , 1 must buy a permit from 2. What amount of h will be produced? Is it Pareto efficient?

11Bb. We have two agents (1 and 2) and 2 goods (A and B). A is a normal good and B a public one. Each agent has an endowment in A of w . The utility functions of the agents are $u_1 = x_1 + \sqrt{B}$ and $u_2 = x_2 - B^2$. Agent 2 can decide the quantity of good B . x_1 and x_2 are the amount of the normal good A that agent 1 and 2 enjoy.

(a) Assume that there is no public intervention. What would be the equilibrium? Would it be Pareto efficient?

(b) One way to get to the Pareto efficient level is to organize a market for B . Let's say that agent 1 can buy credits that will force agent 2 to produce a certain amount of good B . What would be the amount of B produced in this case? Would it still be Pareto efficient?

(c) Is it still the case if we assume a third agent has the same utility as agent 1? Why?

(d) Show the situation on a graph.

¹Inspired by Mas-Colell, Whinston, & Green, 1995. "Microeconomic Theory," Oxford University Press.