

Revision 2 – final

1- Kuhn-tucker

Suppose Mary has utility function

$$u(x) = \alpha_1 \log x_1 + \alpha_2 \log x_2$$

over the amount (x_1, x_2) of two courses to serve at dinner, where $\alpha_1, \alpha_2 > 0$ and $\alpha_1 + \alpha_2 = 1$. Each course requires the same two ingredients, A and B , but in different amounts. Each unit of course 1 requires 3 units of ingredient A and 2 units of ingredient B . Each unit of course 2 requires 2 units of good A and 3 units of good B . Suppose Mary has 30 units of each ingredient to use for the dinner. Her problem is to decide how to allocate the limited supply of the two ingredients in the production of the two courses to maximize her utility.

1.1 Write Mary optimization problem

1.2 Solve using the K-t conditions

2- Competitive equilibrium with production (and profits)

Consider a simple economy with preference given by:

$$U(C,R) = \log C + \log R$$

And the production function is:

$$F(l) = Al^{1/2}$$

Consider the profit of firms are different than zero and equal to π . The consumer constraint is

$$PC + wR = S, \text{ where } S = \text{income and}$$

$$S = wT + \pi$$

$$L+R = T$$

R = leisure

C = consumption

T = total time

Solve for the competitive equilibrium

3. Pareto efficiency - exchange

Lets assume that

$$u^1(x_1^1, x_2^1) = (x_1^1)^{\frac{1}{3}} (x_2^1)^{\frac{2}{3}}$$
$$u^2(x_1^2, x_2^2) = (x_1^2)^{\frac{1}{2}} (x_2^2)^{\frac{1}{2}}$$

Characterize the pareto efficient allocation and contract curve.

4. Pareto & CE

Consider an economy with two individuals (Adam and Eve) each endowed with 100 units of different goods (Adam has 100 tomatoes, x and Eve has 100 pounds of goat cheese, y). Eve's utility is $U^E(x^E, y^E) = x^E + y^E$ and Adam's utility is $U^A(x^A, y^A) = x^A y^A$.

4.1 Depict in an Edgeworth box

4.2 Is the initial allocation Pareto efficient?

4.3 what are the set of pareto efficient allocations

4.4 Assume after an exchange (with an auctioneer announcing prices) Eve has 30 tomatoes and 70 pounds of cheese, while Adam has 70 tomatoes and 30 pounds of cheese. Can this be a 'competitive market allocation' with both Adam and eve taking prices as given? Why?

4.5 compute walrasian equilibrium