General Equilibrium III & Welfare

Advanced Microeconomics - Pratical Lecture 3

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February 18, 2025

First Welfare Theorem

If $(p_x^*, p_y^*, x_A^*, y_A^*, x_B^*, y_B^*)$ is a Walrasian Equilibrium, then $(x_A^*, y_A^*, x_B^*, y_B^*)$ is Pareto Efficient, i.e., all market equilibria are Pareto Efficient.

Assumptions:

(1) Agents are rational and act as price-takers.

(2) Agents' preferences are weakly monotonic.

(3) There are no externalities, public goods, market power nor asymmetric information.

Second Welfare Theorem

If $(p_x^*, p_y^*, x_A^*, y_A^*, x_B^*, y_B^*)$ is a Pareto Efficient, then there is a price vector (p_x^*, p_y^*) and a redistribution of the endowment such that $(p_x^*, p_y^*, x_A^*, y_A^*, x_B^*, y_B^*)$ is a Walrasian Equilibrium.

Assumptions:

(1) Agents are rational and act as price-takers.

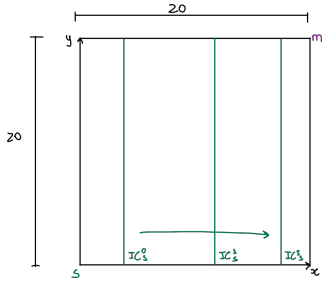
(2) Agents' preferences are weakly monotonic **and weakly convex**.

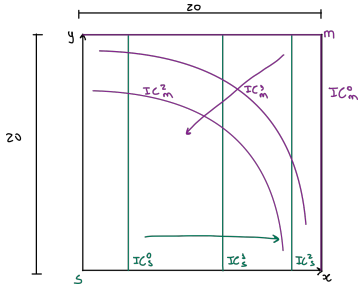
(3) There are no externalities, public goods, market power nor asymmetric information.

Agent s: $U_s(x_s, y_s) = 10x_s \mid x_s = 10, y_s = 10$
Agent m: $U_m(x_m, y_m) = x_m y_m \mid x_m = 10, y_m = 10$

(a) Find the contract curve.

Do both agents have well-behaved preferences?
No! Need to draw the ICs on the Edgeworth box.





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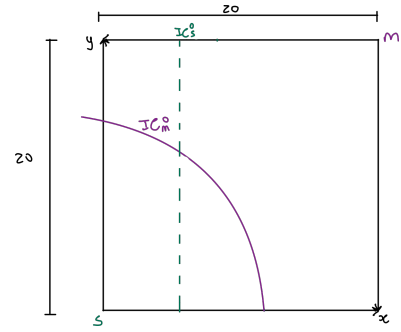

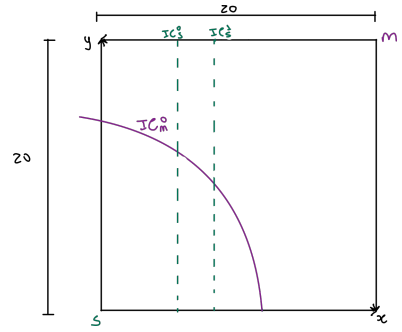

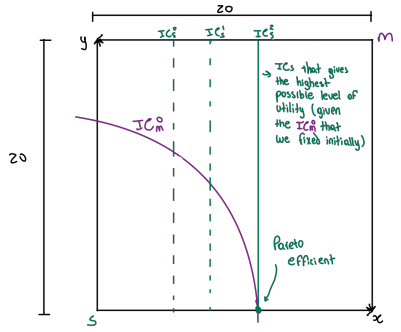

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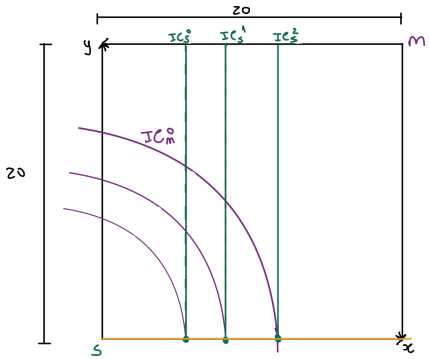

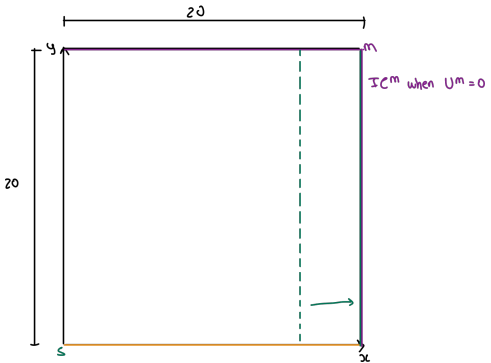

Exercise 2
Problem Set 3

Agent s: $U_s(x_s, y_s) = 10x_s \mid x_s = 10, y_s = 10$
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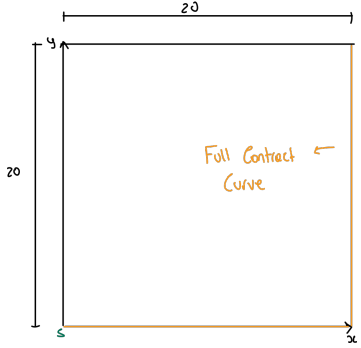

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(b) Find the utility possibility set and frontier.

Utility Possibility Set

Set of all possible combinations of utility levels (given all feasible allocations on the Edgeworth Box).

Utility Possibility Frontier

Set of utility levels associated with Pareto Efficient allocations. In other words, the maximum amount of one agent's utility that can be achieved given a fixed level of utility achieved by all others in the society.

How to **usually** find the UPF:

(1) Find the expression for the contract curve.

(2) Plug the expression of the contract curve into the utility function of Agent A and Agent B.

(3) Invert this last function of one of the agents (e.g., Agent A) and plug into the last function of the other agent (e.g., Agent B).

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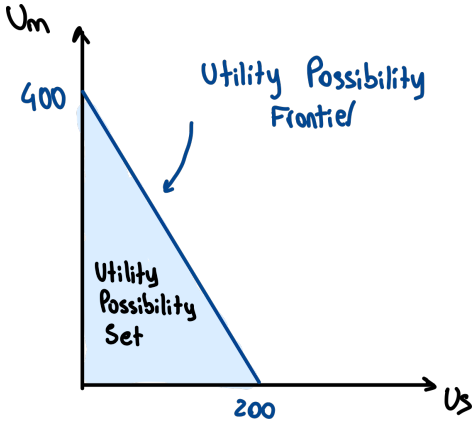

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(c) State the choice of society for allocations under the Utilitarian, Rawlsian, and Cobb-Douglas social welfare functions.

Social Welfare Function

A function of the aggregate welfare that depends on the agents' individual utilities and that ranks different allocations.

Examples:

(1) Utilitarian: $W(U_A, U_B) = U_A + U_B \rightarrow$ An allocation is better for society if it brings higher utility for more people.

(2) Rawlsian: $W(U_A, U_B) = min\{U_A, U_B\} \rightarrow$ The preferred allocation for society is the one who makes the worst off agent better off.

(3) Cobb-Douglas: $W(U_A, U_B) = U_A U_B \rightarrow$ The preferred allocation is one that does not leave any agent with zero level of utility.