HUL 211: Introduction to Economics
IIT Delhi
Practice Problems 2

January 21, 2025

Definition: An allocation $x = \{x_1, x_2, x_3, ..., x_n\}$ is Pareto efficient if and only if there exists no x' such that

$$u_i(x') \geq u_i(x), \forall i.$$

holds and with strict inequality for some i.

An allocation x' is Pareto inefficient if there exists at least one allocation x dominating it.

- Situation 1 is called Pareto superior to situation 2 (a Pareto improvement over situation 2) if no individual is worse off in the first than in the second while at least one individual is strictly better off.
- Situations are called Pareto efficient, Pareto optimal or just efficient if Pareto improvements are not possible.

Typical trade-offs: a policy may increase national output but also increase inequality, it may increase employment but also increase inflation, it may benefit one group but make another group worse off...

1. If the set of feasible allocations is convex, then, to any Pareto optimal allocation corresponds one set of weights, such that that particular allocation is the one maximizing the households weighted sum. True or False? Argue why? What if the set of feasible allocations is concave?
2. Consider the production of wine and cheese in France and Spain. This table gives the number of necessary hours to produce each (labor is the only input):
   (a) For each good, which country has an absolute advantage? For each good, which country has a comparative advantage?

	France	Spain
1 Kilo of Cheese	4	6
1 Bottle of wine	6	12

Figure 1: Table

(b) Is it in Spain's interest to develop trade relationships with France? Is it in France's interest to trade with Spain? Is France more competitive at producing both goods?

(c) Suppose that France and Spain are under autarky (no trade). Draw the production possibility frontier for each country for the number of goods they can produce in one day (24 hours, one worker).

(d) France and Spain decide to trade and suppose they agree to trade one bottle of wine for k kilos of cheese. What values of k would make both France and Spain strictly better off under trade? Draw the new consumption set for each country under trade. How has it changed and why?

3. Consider the two Ricardian economies whose endowments and technologies are those described below. Each has a fixed endowment of labor – its only factor of production – and can produce two goods, X and Y, using the indicated constant amounts of labor per unit of output:

	Endowment of Labor	Per-unit labor requirement for producing	
		X	Y
Country A	60	1	2
Country B	120	2	3

Figure 2: Table

(a) Draw the production possibility frontiers for each of these countries.

(b) Which country has an absolute advantage in good X? Which in good Y? Which has a comparative advantage in good X? Which in good Y?

(c) Discuss the possibilities of trade. Draw the new consumption set for each country under trade.

4. Observe the picture below. Discuss the notions of pareto efficiency and economic efficiency.

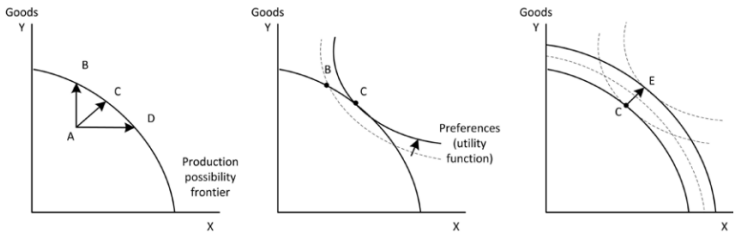

Figure 3: Efficiency