Production Possibility Frontier

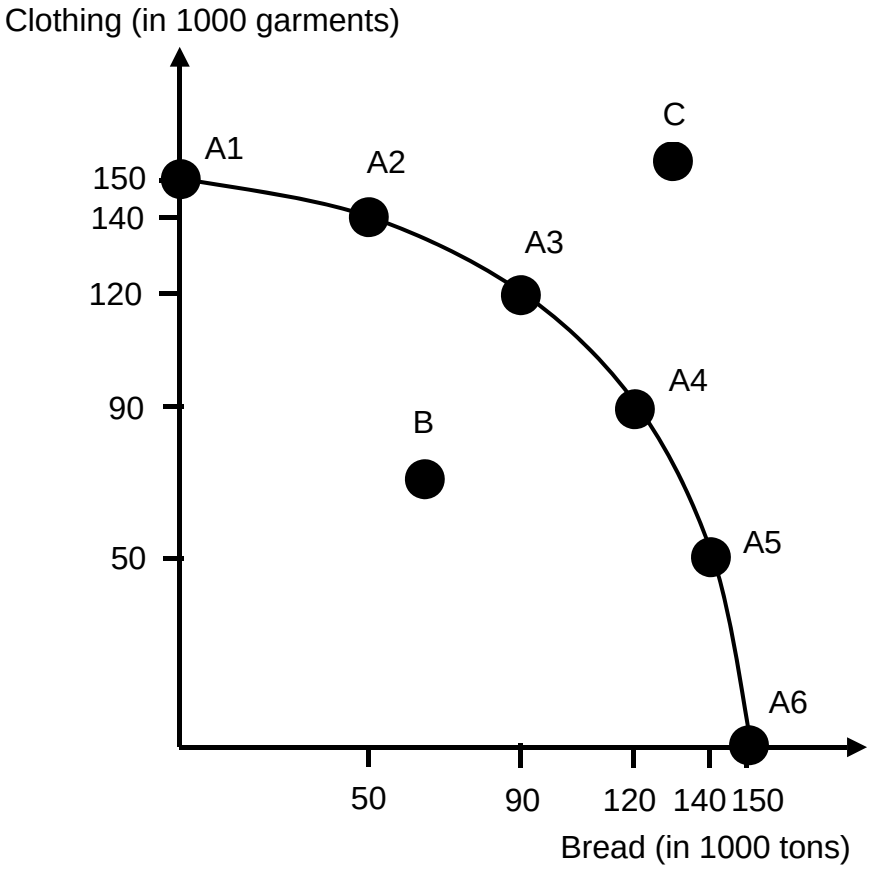
1 Assumptions

- Only 2 goods are produced, loaves of bread (X) and articles of clothing (Y).
- The factors of production can be used in the production of any of the 2 goods. There are 500 workers.

2a An example of a production possibility frontier (PPF)

Point	Production of bread (X)		Production of clothing (Y)	
	Number of workers	Production (tons)	Number of workers	Production (garments)
A1	0	0	500	150'000
A2	100	50'000	400	140'000
A3	200	90'000	300	120'000
A4	300	120'000	200	90'000
A5	400	140'000	100	50'000
A6	500	150'000	0	0

2b The same example as a curve



3 Interpretations

- The combinations **A1 to A6** are possible and **efficient**. All factors of production are **fully employed.** In general: All combinations on the PPF are efficient.
- Combination A1: Only clothing is produced. / Combination A6: Only bread is produced.
- Combination **B** shows a situation of **unemployment.** B is **inefficient.**
- Combination **C** cannot be produced and is, therefore, **unattainable**.
- The production possibility frontier shows the **Law of increasing opportunity costs:**

  Opportunity costs (from A1 to A6) = $\frac{\text{Loss in the production of clothing (Y)}}{\text{Gain in the production of bread (X)}}$

  Example (Opportunity costs, expressed in garments per ton of bread)

  From A1 to A2: $\frac{10'000}{50'000} = 0.2$

  From A2 to A3: $\frac{20'000}{40'000} = 0.5$

  From A3 to A4: $\frac{30'000}{30'000} = 1.0$

  From A4 to A5: $\frac{40'000}{20'000} = 2.0$

  From A5 to A6: $\frac{50'000}{10'000} = 5.0$

- In addition, the **Law of diminishing returns** (per worker) can be observed:

  Returns per worker (from A1 to A6) = $\frac{\text{Increase in the production of bread (X)}}{\text{Increase in the number of workers (X)}}$

  Example (in tons of bread per worker):

  From A1 to A2: $\frac{50'000}{100} = 500$

  From A2 to A3: $\frac{40'000}{100} = 400$

  From A3 to A4: $\frac{30'000}{100} = 300$

  From A4 to A5: $\frac{20'000}{100} = 200$

  From A5 to A6: $\frac{10'000}{100} = 100$

4 **Growth** as an outward shift of the PPF