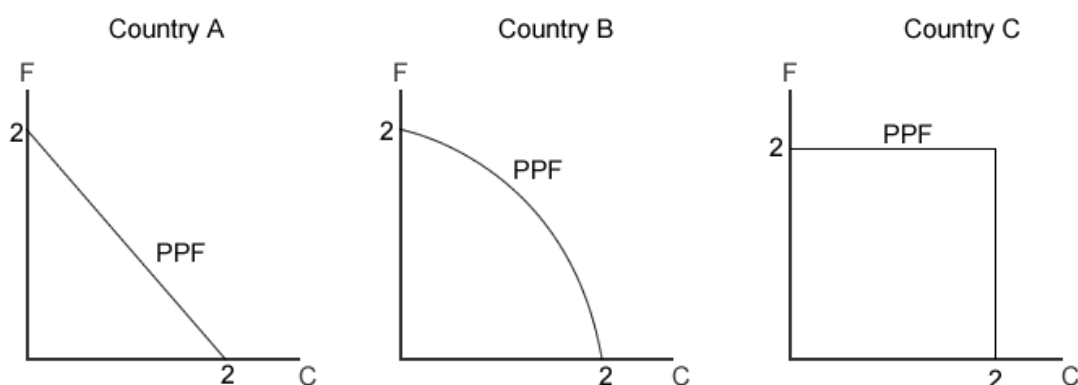


Exercise Sheet 1: Basics

In this exercise sheet we will review some basic concepts of microeconomics that will be important throughout the course. In order to be able to follow the course it is important that you have a good understanding of the concepts discussed in this exercise sheet. If necessary, make sure you review the relevant material from your introductory microeconomics class.

Exercise 1

The following graph shows the production possibility frontiers (PPF) of three different countries (country A, country B and country C). The X-axes show production of clothing (C) and the Y-axes show production of food (F).



- What is the PPF?
- The slope of the PPF is called the **marginal rate of transformation (MRT)**. Explain in words what the marginal rate of transformation tells you. What is the marginal rate of transformation in each country?
- Suppose all countries trade in world markets. The world price of clothing is given by $P_C = 1\$$ and the world price of food is given by $P_F = 1\$$. Draw the isovalue lines and show for each country which amount of clothing and food it produces. (you just need to show it graphically).

d) Now suppose the world price of clothing increases to $P_C = 2\$$ while the price of foods remains the same. Show how this affects production of clothing and food in each country. (again, it is enough to show it graphically).

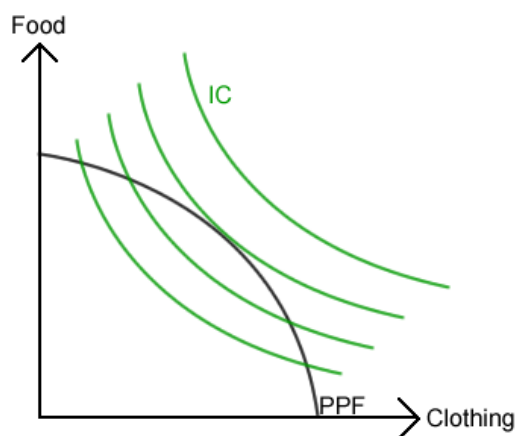
e) Given the world price of food of $P_F = 1\$$, for which world price of clothing will country A produce only clothing? For which will it produce only food?

f) Will country C always produce both goods, no matter what the world prices are?

g) With the PPF and the isovalue line we can tell which amount of clothing and food each country produces. Can we tell which amount of clothing and food each country consumes?

Exercise 2

The following graph shows the PPF and indifference curves (IC) for country A.



a) What are indifference curves?

b) The slope of indifference curves is called **marginal rate of substitution (MRS)**. Explain in words what the marginal rate of substitution tells you.

c) Suppose country A does not engage in trade (it lives in autarky). Show graphically which amount of clothing and of food country A produces, i.e. on which point on the PPF the country produces.

d) At the point where the country produces and consumes in autarky, it must hold that $MRS = MRT$. Explain intuitively why this condition must hold at the optimal production point. (hint: Explain how the country could improve its welfare by shifting the production to another point on the PPF if the condition $MRS=MRT$ is not fulfilled).

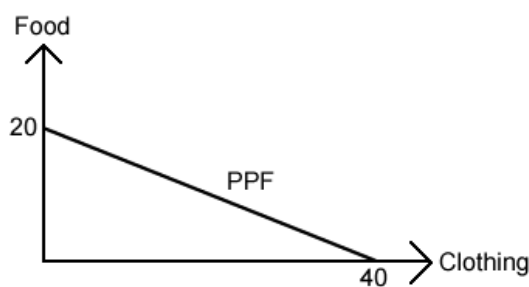
e) The relative price of clothing to food is denoted by $\frac{P_C}{P_F}$. Explain intuitively why it must hold that $MRS = \frac{P_C}{P_F}$ at the point where the country produces and consumes in autarky. (what would happen if this condition did not hold?)

f) Suppose the world relative price of clothing to food is higher than the relative price of clothing in country A under autarky. Show graphically what happens in country A if the country opens up to trade. How does production and consumption change? Is it still true that $MRS = MRT$ under trade?

g) Do you think the following statement is true? *Whenever world relative prices of clothing and food are different than the relative prices that prevail in autarky, country A is better off if it engages in trade, rather than living in autarky.*

Exercise 3

Suppose country A has the PPF shown in the following graph. It can produce maximally 40 units of clothing and maximally 20 units of food.

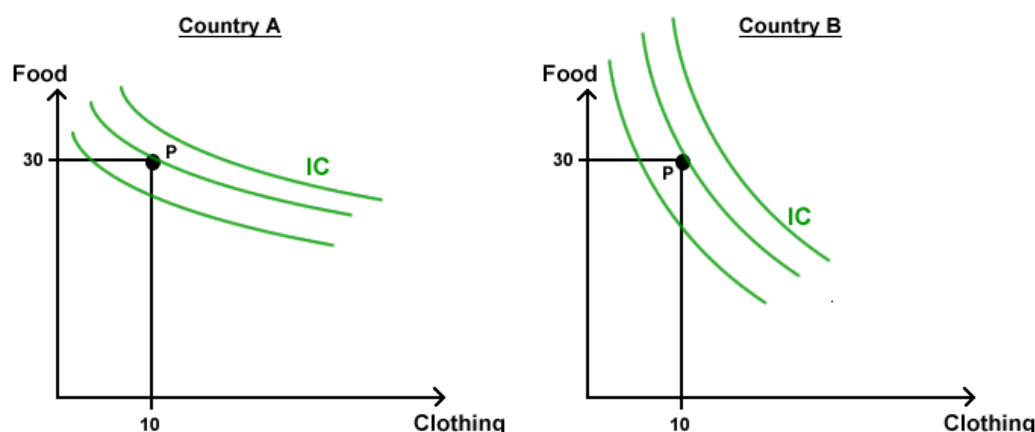


Suppose country A has very rigid taste patterns. Whatever the relative prices of clothing and food, people in this country always want to consume two units of food for each unit of clothing they consume (this type of preferences is called *Leontief-preferences*).

- a) Draw indifference curves of country A.
- b) How many units of food and clothing does the country produce and consume under autarky? (you can compute the numbers). What is the price of clothing relative to food under autarky? $\left(\frac{P_C}{P_F}\right)$
- c) Suppose the country opens up to trade and the price of clothing relative to food on world markets is $\frac{P_C^*}{P_F^*} = 1$. Show how opening up to trade changes production and consumption in country A. Is the country better off with trade?

Exercise 4

Consider two countries that have the same PPF but different preferences, as shown in the following graph. Under autarky they produce and consume at point P.



- a) Which country "likes clothing more"? Which country has the higher relative price of clothing (to food) under autarky?
- b) Suppose the world consists only of these two countries. If the two countries open up to trade the world relative price of clothing is going to lie somewhere in between the two autarky prices. Show graphically how consumption in both countries change if they open up to trade. Are the countries better off with trade?