

International Economics

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Problem Set 1

Exercise 1: Comparative advantage

Consider two isolated islands, Palawan and Mindanao. Both of them have a stock of fruits - bananas and coconuts. The quantity of bananas on both islands is the same, but the quantity of coconuts is twice as big on Palawan than on Mindanao. In addition we know that Mindanao has three times more of bananas than of coconuts.

- a. Will there be any difference in relative (autarky) prices between the two islands? Explain.

Solution:

We know that: $q_B^P = q_B^M$, $q_C^P = 2 \cdot q_C^M$ and $q_B^M = 3 \cdot q_C^M$. Therefore the price ratio in Mindanao in autarky is $p^M = \frac{q_B^M}{q_C^M} = 3$. For Palawan we know that $q_B^P = q_B^M = 3 \cdot q_C^M = \frac{3}{2} q_C^P$, so that $p^P = \frac{q_B^P}{q_C^P} = \frac{3}{2}$.

- b. What kind of trade flows can you expect between the islands?

Solution:

As coconuts are *relatively* cheaper on Palawan than on Mindanao, Palawan is going to export coconut and to import Bananas from Mindanao (and viceversa).

- c. Draw a line of relative prices and show the change in relative prices for both islands after trade. Explain.

Solution:

See below

- d. Represent graphically gains from trade for Palawan. (triangle of exchange)

Solution:

See below.

Exercise 2: Ricardian model of trade (I)

Take two economies in autarky, Denmark and Netherlands, endowed with 400 and 500 hours of work, respectively. Both countries produce two types of goods, cheese and bread:

Output per hour	Denmark	Netherlands
Cheese	4	2
Bread	0.5	1

- a. Which country has absolute advantage in the production of cheese? Which in bread?

Solution:

Denmark has an absolute advantage in the production of cheese, while the Netherlands have it in the production of bread.

- b. What is relative price of cheese in Denmark, the Netherlands?

Solution:

Unit costs	Denmark	Netherlands
Cheese	1/4	1/2
Bread	1/0.5	1

The relative price of cheese in Denmark is $\frac{1/4}{1/0.5} = 1/8$, while the relative price of cheese in the Netherlands is $\frac{1/2}{1} = 1/2$.

- c. Which country has comparative advantage in cheese? Which in bread? Explain.

Solution:

As the relative price of cheese is lower in Denmark than in the Netherlands, Denmark has a comparative advantage in the production of cheese.

- d. What are the upper and the lower bound of the free trade price? Do countries specialize partially or completely?

Solution:

The upper and lower bound of the F.T.P. are the autarky prices for cheese and bread respectively. As a result, the two countries will specialize completely (the Danes in the production of cheese and the Dutch in the production of bread). The F.T.P of cheese and bread will be $\frac{y_B}{y_A} = \frac{p_A}{p_B} = \frac{500 \cdot 1}{400 \cdot 4 + 0} = 0.3125$ respectively.

- e. Draw the PPF of Denmark. What is its slope? Idem for Netherlands. Draw PPF of this two-country world.

Solution:

See below

Exercise 3: Ricardian model of trade (II)

Take two closed economies, Brazil and the United States. Both countries produce two types of goods, Wheat and Cloth, with the following output per worker and good:

Country	Wheat	Cloth	Labor Endowment
United States	2	8	100
Brazil	1	2	120

- a. **Identify which country has the absolute advantage in the production of either good.**

Solution:

The United States has the absolute advantage in both goods. One US worker produces 2 bushels of wheat, compared to the average Brazilian worker (who only produces 1 bushel of wheat; at the same time, a single US worker produces 4 times the amounts of cloths produced by its Brazilian counterpart.

- b. **What is the opportunity cost of wheat in the US and in Brazil?**

Solution:

The opportunity cost of a bushel of wheat in the US is equal to 4 units of clothing, while it is just 2 units of clothing in Brazil. Brazil has therefore a lower opportunity cost of producing wheat.

- c. **What is the opportunity cost of cloth in both countries?**

Solution:

The opportunity cost of a unit of clothing in the US is $1/4$ bushel of wheat; in Brazil it is $1/2$ bushel. The US has a lower opportunity cost in producing cloth, compared to wheat.

- d. **Who has the comparative advantage in which good?**

Solution:

Comparative advantage goes to the producer facing the lower opportunity cost. Thus, Brazil has a comparative advantage in wheat and the US has it in producing cloth.

- e. **What are the limits of the post-trade relative price of wheat?**

Solution:

Autarky price ratios will reflect the opportunity costs faced in either country. Therefore, before opening up to trade, P_x/P_y will be 4 in the US and 2 in Brazil before trade. After trade, the world's relative prices will settle somewhere between 2 and 4.

- f. **Suppose the actual post-trade relative price of wheat to clothing is 3. Draw the pre- and post-trade PPF and TPF. Who gains from trade?**

Solution:

To construct PPFs, we must find the maximum possible outputs. They are given by the following table:

Country	Maximum output	
	Wheat	Cloth
United States	200	800
Brazil	120	240

After trade, with a price of wheat relative to clothing of 3, the US will specialize in cloth and its 1600 units of cloth will purchase $1600/3$ units of wheat (533.33) - more than it could have produced itself before trade. Accordingly, Brazil will specialize in wheat, and its 120 units of wheat will be able to purchase up to 360 units of cloth, more than the 240 units it could have produced itself before trade.

Exercise 4: Revealed Comparative Advantage

Consider the intra-EU trade in the HS category 840734 (Engines; reciprocating piston engines, of a kind used for the propulsion of vehicles of chapter 87, of a cylinder capacity exceeding 1000cc). Real trade figures are reported in the table below. Compute the revealed comparative advantage of two countries of your choice.

Exporter	HS840734 (\$ mn)	Total (\$ mn)
AUT	1389.8	120886
BEL	11.4	320070
BGR	1.1	22868
CZE	84.2	166444
DEU	2439.0	874504
DNK	1.8	62247
ESP	235.8	216527
EST	0.05	10928
FIN	0.80	44376
FRA	1491.0	331049
GBR	790.1	222918
GRC	0.07	19815
HRV	0.04	12013
HUN	3551.0	95890
IRL	0.11	82447
ITA	257.5	304896
LTU	5.3	18893
LVA	0.09	10627
NLD	22.2	395941
POL	78.7	205161
PRT	2.4	53349
ROU	10.9	60267
SVK	249.4	76958
SVN	2.3	28676
SWE	316.2	95772
EU	10941	3853522

Table 1: Intra EU Trade in HS category 840734 in the year 2018

Solution:

The Balassa's RCA Formula is

$$RCA_{i,s} = \frac{X_{i,s}/X_i}{X_{r,s}/X_R} \quad (1)$$

Considering Germany and Austria, their RCA in class 840734 for the year 2018 is respectively

$$RCA_{DEU,840734} = \frac{2439/874504}{10941/3853522} = 0.98 \quad (2)$$

$$RCA_{AUT,840734} = \frac{1389.8/120886}{10941/3853522} = 4.05 \quad (3)$$

Accordingly, Austria has a comparative advantage in producing ... those goods. Germany, on the other hand, has no comparative advantage in producing them.

Exercise 5: General questions

- a. Many countries in sub-Saharan Africa have very low labor productivity in many sectors, for example in manufacturing and agriculture. They often despair of even trying to attempt to strengthen their industries unless it is done in an autarkic context, behind protectionist walls. The reason is that they do not believe they can compete with more productive industries abroad. Comment this statement, and discuss this issue in the context of the Ricardian model of comparative advantage.

Solution:

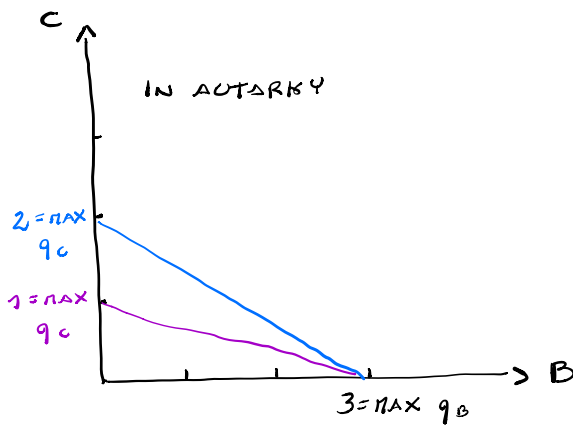
Left as homework.

- b. In 1975, wage levels in South Korea were roughly 5% of those in the United States. It is obvious that if the United States had allowed Korean goods to be freely imported into the United States at that time, this would have caused devastation to the standard of living in the United States, as no producer in the US could have possibly competed with such low wages. Discuss this assertion in the context of the Ricardian model of comparative advantage.

Solution:

Left as homework.

EXERCISE 1 - POINT C



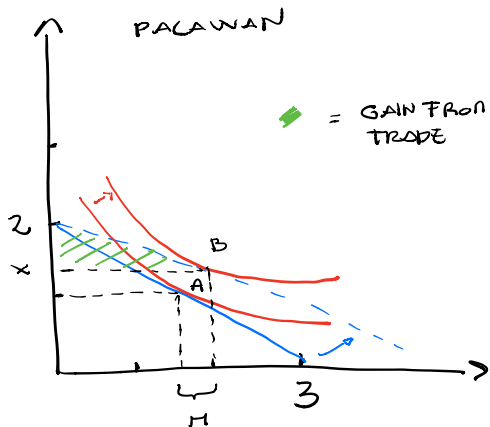
$$P_n = \frac{q_B^n}{q_C^n} = \frac{3}{1} = 3$$

$$P_p = \frac{3}{2}$$

■ = PALAWAN

■ = MINDANAO

EXERCISE 1 - POINT D



EXERCISE 3 - POINT F

