

INTERNATIONAL TRADE AND THE WORLD ECONOMY

CHARLES VAN MARREWIJK

Answers to * exercises in chapter 10 of the Study Guide

STEPHAN SCHÜLLER AND DANIËL OTTENS

The * exercises in chapter 10 are: 10.4 and 10.7.

Question 10.4

10.4A.

In the Dixit-Stiglitz model the consumers maximise utility and the firms maximise profits. This leads eventually to an equilibrium with a certain number of varieties being produced. In equilibrium the firms have zero profits. The consumers will want to spend all their income to reach maximal utility. The model is currently not in equilibrium (the firms face identical demand conditions but charge different prices, the profit level can therefore not be equal to zero for all firms simultaneously).

If we calculate the demand for each car by using equation (10.4) and the information from the question, that is using

$$(10.4) \quad c_j = p_j^{-e} [P^{e-1} I], \quad \text{where } P = \text{price index}, \quad e \equiv 1/(1-r) > 1$$

$$p_{Porsche} = 10; p_{Lamborghini} = 5; p_{Ferrari} = 10$$

$$r = 0.5; I = 100; P = 2.5$$

we get: $c_{Lamborghini} = 5^{-2} [2.5^1 \cdot 100] = 10$

$$c_{Porsche} = c_{Ferrari} = 10^{-2} [2.5^1 \cdot 100] = 2.5$$

From which it follows that Porsche and Ferrari have a revenue of 25 (= 10*2.5) and a cost of 7.5 (= 5 + 1*2.5) each, therefore each making a profit of 17.5. At the same time Lamborghini has a revenue of 50 (= 5*10) and a cost of 15 (= 5 + 1*10), therefore making a profit of 35.

10.4B.

We can calculate the firm's scale of production using equation (10.8).

$$(10.8) \quad x = \frac{f(\mathbf{e} - 1)}{m}$$

Since $f = 5$; $\mathbf{e} = 2$; $m = 1$, the firm's scale of production is 5 cars in equilibrium.

The labour required for this output is: $5 + 5 \cdot 1 = 10$ labourers.

10.4C.

We can use equation (10.9) to determine the number of varieties on the market.

$$(10.9) \quad N = L / f\mathbf{e} = 50 / 5 \cdot 2 = 5$$

(that is 50 labourers available divided by 10 labourers to produce the firm's equilibrium scale of production gives 5 varieties to be produced). In equilibrium there are therefore five car manufacturers producing a total of 25 cars. The three original firms (Porsche, Ferrari, and Lamborghini) produce 15 cars in equilibrium.

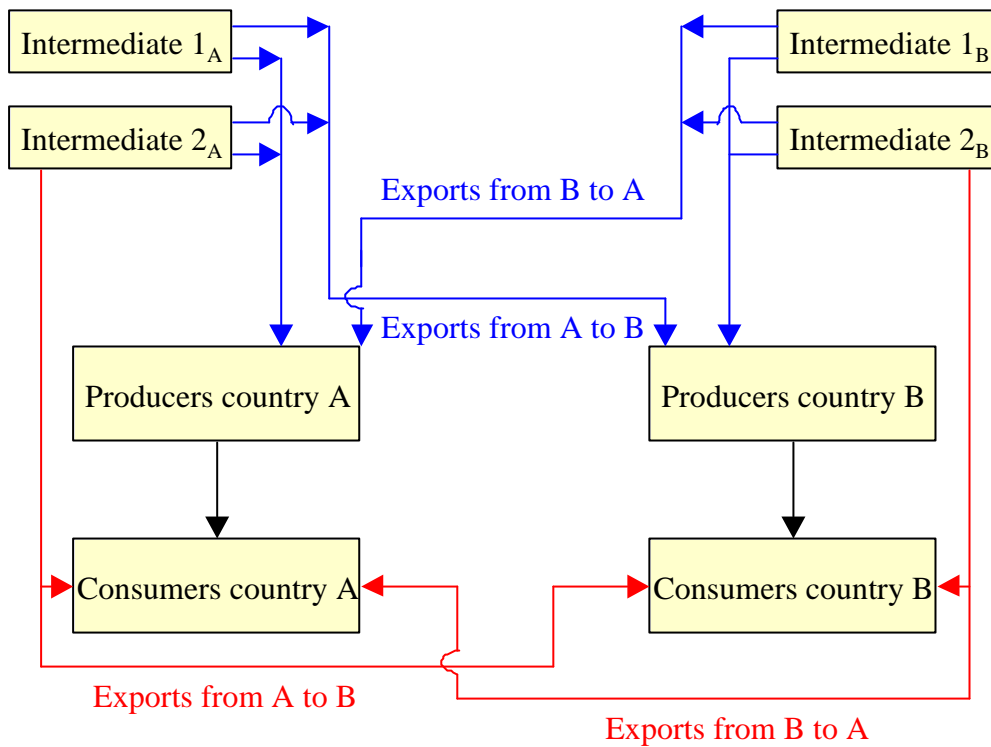
10.4D.

The individual car manufacturers have considerable market power as there are only five producers in equilibrium. We have assumed that they take the price level of the market as given in setting their own price. However, with such a limited number of suppliers the price setting behaviour of one supplier has a considerable impact on the price index and on the price likely to be charged by the competition. It would be better in this particular setting to take these effects into account somehow.

Question 10.7

10.7A.

Several possibilities are available in answering this question, one of which is drawn in the figure below. Both country A and country B produce two intermediate goods. As denoted by the blue arrows in the figure, these are combined by producers in each country into a final good consumed by the respective consumers in each country, similar to the Ethier interpretation. The blue arrows from one country to the other therefore represent trade in intermediate goods. As the red arrows indicate, the figure assumes, at the same time, that the second intermediate good can also be used as a final good for consumption, similar to the Krugman interpretation. Both countries produce two final goods and two intermediate goods, as required by the question. The red arrows from one country to another therefore represent trade in final goods.



10.7B.

Free trade is advantageous for the two countries not only because it allows them to increase the extent of the market and enjoy the consumption of more varieties of final goods, but also because it allows them to increase the extent of the intermediate goods market, which leads to positive production externalities.