International Economics
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Answer key

PROBLEM 1

1.1 False. According to the Hecksher-Ohlin model U.S. should export capital intensive goods and import labor intensive goods. Leontief found that this was not the case. The Stolper-Samuelson theorem, in contrast, is about how price changes affect factor prices.

1.2 False. If domestic residents hold the import license and the country is large enough to affect the import price, then overall welfare may rise.

1.3 True. The theory of the second best states that if one market fails to work properly, it is no longer optimal to abstain from intervention in other markets. For example, a tariff may be optimal, if there is a marginal social benefit to production of a good that is not caputred by producer surplus measures.

1.4 True. The benefit from horizontal FDI is to avoid trade costs on exports, while the costs derive from the investment costs and the forgone benefits from economies of scale.

1.5 True. If the input using low skilled labor relatively intensively also is relatively intensive in the use of capital, then capital fligth hurts the low skilled relatively more. This is because there is a relatively strong complementarity between low skilled labor and capital.

PROBLEM 2

Consider a monopolist that faces a linear demand curve. The cost function of the monopolist is given by a constant marginal cost and a fixed cost.

Question 2.1: *Illustrate graphically how the price, the quantity and profits of the monopolist are determined.*

See Figure 8-1 in Krugman, Obstfeld and Melitz (2012).

Assume now that other symmetric firms enter the market such that the market structure is charaterized by monopolistic competition. All firms have the same cost function as above and they now face a demand function of the form

$$Q = S\left(\frac{1}{n} - b\left(P - \overline{P}\right)\right),$$

where Q is the quantity demanded, S is the fixed total output of the industry, n is the number of firms in the industry, P is the price charged by the firm itself, $\overline{P}$ is the average price charged by its competitors, and $b > 0$ is a constant.

Question 2.2: *Discuss the properties of this demand function and how it corresponds to a linear demand function. Explain how the number of firms is determined in a zero profit equilibrium. (Hint: use a diagram showing how the number of firms affect i) average costs, and ii) the price.)*

In monopolistic competition models each firm produces differentiated products, and each firm is assumed to take the prices charged by its rivals as given (P is taken as given). This means that the demand function can be written

$$Q = A - BP,$$

where $A = \frac{S}{n} + Sb\overline{P}$ is perceived as constant by the firm and $B = Sb$.

We can then find the relationship between n and P by maximizing profits. Setting marginal revenue equal to marginal costs, c, we get

$$P - \frac{Q}{Sb} = c$$

Now we can use that firms are symmetric such that $Q = \frac{S}{n}$. This implies that

$$P = c + \frac{1}{nb},$$

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so the price is a mark up over marginal costs, which declines in n.

Average costs can be written

$$AC = \frac{F}{Q} + c = \frac{Fn}{S} + c,$$

which is a straight line with positive slope crossing the vertical axis at c.

These two lines can now be combined to find the equilibrium number of firms as in Figure 8-3.

Suppose now that the economy is opened and trade takes place with another country. This implies that an integrated world market is formed such that the market size, S, is increased.

Question 2.3: *How does that affect the number of firms? Are there gains from trade?*

Only the AC curve is affected by a larger market size. It becomes flatter and so the number of firms increases, see Figure 8-4. Intuitively the fixed costs are spread over more units of output due to the bigger market, so there is room for more firms.

Yes there are gains from trade due to lower prices and a greater variety of goods (consumers may have a "love of variety").

Assume now that firms are different with respect to their marginal costs, while all other assumptions are unchanged.

Question 2.4: *Show graphically how the price, quantity and operating profit depend on the firm's marginal cost. Explain also the existence of a cutoff marginal cost above which firms earn negative operating profits. What are the implications of an increased market size?*

The price rises, the quantity and profits fall as the marginal cost rises (see Figure 8-6). As shown from the same figure, if marginal costs exceed the demand curve's intersection with the vertical axis, the firm will earn negative operating profits. In this case firms will exit the market.

When the market size increases the shape of the demand function changes. The intercept with the vertical axis is obtained by setting $Q = 0$ to get $P = \frac{A}{B} = \frac{\frac{S}{n} + Sb\overline{P}}{Sb} = \frac{1}{bn} + \overline{P}$. So the intercept decreases. The slope of the demand function is $-\frac{1}{B} = -\frac{1}{Sb}$, so it becomes flatter. As shown in Figure 8-7 this means that small high cost firms get lower demand, while large low cost firms get higher demand. This, in turn, implies that there

will be a new lower cost cutoff, so some high cost firms exit. The low cost firms gain as they set lower prices and mark ups but gain market shares and higher profits.

Question 2.5: *In the real world only a subset of firms within industries export. How can the model explain this fact?*

The model can explain this fact by introducing a per unit trade cost, t. Marginal costs in the export market will then be $c_i + t$. See Figure 8-8. This implies that the lowest cost firms export, higher cost firms produce for the domestic market but do not export, and the highest cost firms earn negative profits and exit.