

## Answers for Session 11 Homework

2. Now imagine a second country that can also produce textiles and computers. This new country (Country B) has the following production functions for these goods

$$Q_t = 5L_t$$

$$Q_c = 5L_c$$

- a. Which country (A or B) has an absolute advantage in the production of both goods?

*Country B produces more textiles and more computers per unit of labor than Country A does. Therefore, Country B has an absolute advantage in textiles and an absolute advantage in computers.*

- b. Which country has a comparative advantage in the production of textiles?

*Think in terms of opportunity cost. If Country B switches a unit of labor from computer production to textiles production, then it gains 5 units of textiles and loses 5 units of computers. So the opportunity cost of one unit of computers in Country B is one unit of textiles.*

*Meanwhile, if Country A switches a unit of labor from computer production to textile production, then it gains 2 units of textiles and loses 1 unit of computers. So the opportunity cost of one unit of computers in Country A is two units of textiles.*

*Since the opportunity cost of producing computers is higher in Country A than in Country B, Country B has a comparative advantage in computers, and Country A has a comparative advantage in textiles.*

- c. Assuming these countries do *not* trade, what is the relative price of computers in terms of textiles in Country B? (Hint: Repeat the analysis we did for Country A above.)

*If you follow the analysis as was shown in part 1, you will see that the relative price of computers to textiles in Country B is  $P_c/P_t=1$ .*

*If we note that the opportunity cost is exactly the same thing as the relative prices, then we could put the answer to (b) another way:*

*The relative price of computers to textiles in Country A is  $P_c/P_t=2$ . The relative price of computers to textiles in Country B is  $P_c/P_t=1$ . Computers are relatively expensive to produce in Country A, and textiles are relatively expensive to produce in Country B. Hence Country A has a comparative advantage in textiles, and Country B has a comparative advantage in computers.*

- d. How many computers can a worker in Country B buy for one unit of labor?

*In answering (i) you will find that the wage in Country B is*

$$w = 5P_c$$

*(This comes directly from the profit function for firms in Country B.)*

*Therefore, a worker earns 5 times the price of unit of computers for every unit of labor worked. So the worker can buy 5 units of computers.*

- e. How many units of textiles could she buy?

*In answering (i) you will also find that the wage in Country B is*

$$w = 5P_t$$

*So the worker could buy 5 units of textiles.*

- f. Is Country B rich or poor relative to Country A?

*Workers in Country A could buy only 2 units of textiles or 1 unit of computers after one hour of work. Hence workers in Country B are significantly better off.*

3. Now we're going to let these two countries trade. People in Country A might be afraid of trade: after all, Country B has a large absolute advantage in the production of everything. How can workers in Country A compete? Similarly, people in Country B might be afraid of trade: all those people in Country A earn so little for a unit of work. All those high paying jobs in Country B are going to go to Country A!

For simplicity, let's assume that the international price of textiles turns out to be

$$P_c = 1.5P_t$$

- a. With these international prices, does Country A specialize in textiles or computer production?

*Textiles production. For every unit of effort in computer production, they can buy 1.5 units of textiles abroad. But why do that when you can switch that same labor to textiles and produce 2 units of textiles? Then they can buy that 1 computer and have 0.5 units of textiles left over. So it makes no sense for Country A to produce computers – they are better off producing textiles, where they have their comparative advantage – and buying computers abroad.*

- b. Which product does Country B specialize in?

*Computer production. For every unit of effort in computer production, Country B can buy  $1.5 \times 5 = 7.5$  units of textiles abroad. That's a lot better than the 5 units of textiles they would have produced if Country B used that labor in textiles instead. So it makes no sense for Country B to produce textiles – they are better off producing computers, where they have their comparative advantage – and buying computers abroad.*

- c. Now how many computers can a worker in Country A buy for one unit of labor? How many textiles can she buy?

*For one unit of labor, a worker in Country A can buy 2 units of textiles (produced domestically) or, through trade,  $2/1.5 = 4/3$  units of computers.*

- d. How many computers can a worker in Country B buy for one unit of labor? How many textiles can she buy?

*For one unit of labor, a worker in Country B can buy 5 units of computers (produced domestically) or, through trade,  $5 \times 1.5 = 7.5$  units of textiles.*

- e. Did workers in Country A become richer or poorer once trade was allowed?

*Compare their consumption possibilities in a trading world and a no-trade world. Without trade, they could consume up to 2 units of textiles or 1 unit of computers per hour worked. With trade, they can consume 2 units of textiles or  $4/3$  units of computers. Their consumption possibilities have increased – they are richer.*

- f. Did workers in Country B become richer or poorer?

*Without trade, they could consume up to 5 units of textiles or 5 unit of computers per hour worked. With trade, they can consume 7.5 units of textiles or 5 units of computers. Their consumption possibilities have increased – they are richer.*

- g. Now think about these results. People in rich countries often seem to be afraid of trade because they don't think they can compete with cheap labor. They seem to think that "our jobs will go abroad". Meanwhile, people in poor countries often seem afraid of trade because they don't think they can compete with highly productive firms in richer countries. They also seem to think that "our jobs will go abroad". What does our model say about these views? (What happened to employment in this model?) Is this model providing a satisfying answer?

*Once we allow trade, the model says that each country will completely specialize in the production of one good. All the textile workers in the rich country lose their jobs, and all the computer workers in the poor country lose their jobs. In this sense, the fears are exactly correct: lots of jobs do go abroad.*

*But this is not the whole story – it misses a crucial point. In this model job loss is entirely painless, because workers are all immediately re-employed. While this is not literally true in the real world – and the fact that is not entirely true raises real concerns – the basic lesson of this model (and of the concept of comparative advantage) is that jobs are created by trade as much as they are destroyed. On net, this model suggests, there is no change in employment. Only the quality of employment improves so that workers are better allocated worldwide to their most productive tasks.*