

ECO 352 – International Trade – Spring Term 2010  
MIDTERM EXAMINATION – ANSWER KEY

The distribution of grades was as follows:

Range	90-99	80-89	70-79	60-69	50-59	40-49
Numbers	5	13	10	5	0	2

The question-by-question aggregate statistics were:

	Q.1 (/20)	Q.2 (/40)	Q.3 (/40)	Total
Mean	15.9	26.1	35.7	77.8
StdDev	2.8	8.8	5.9	13
Median	16	27	37	80

Generally a very good performance, but some avoidable weakness.

In Q.2, the big distinction was between those who could draw the offer curves and those who could not. Some drew just the general-shaped offer curves; you need to draw the ones for the specific functional forms (Cobb-Douglas) specified.

In Q.3(c), several people were unable to explain why labor fares ambiguously in the medium run, even though this had been covered in the context of the sample exam both in the precept and the review session.

In Q.3(d), some of you spoke of an improvement America's terms of trade. The terms of trade are not just any relative price; they are the relative price of the exported good. Since the question does not specify which good is exported (and in fact this part makes an explicit issue of that), you cannot say that an increase in the price of corn relative to autos (same as a fall in the price of autos relative to corn) is an improvement in America's terms of trade.

**QUESTION 1: 20 points**

[1] (10 points) U.S. automakers compete against other American industries for labor (and perhaps also for capital to the extent that capital is not fully internationally mobile). This competition determines the wages they have to pay, and therefore their costs. Even if the American auto industry's productivity matches or even exceeds that of the Japanese auto industry, if other American industries have an even bigger productivity advantage over the corresponding Japanese industries, then American auto makers will have to pay much higher wages and will remain at a cost disadvantage vis a vis Japanese ones. This is exactly the Ricardian notion of comparative advantage. Even if American auto makers have absolute advantage over Japanese ones, they need not have comparative advantage. There can also be a demand side effect if American and Japanese consumers' taste for autos differ.

[2] (10 points) This is false; comparative advantage also ensures that each country as a whole gains (or at least does not lose) from trade. A good answer will give a brief explanation. This can be verbal – comparative advantage implies that the country exports the good for which it has a lower relative autarkic price; the relative price of this good under trade is higher; therefore trade improve the country's terms of trade. Or it can be a simple diagram – terms of trade and utility (March 4 slides p.4, PPF and indifference curve (March 4 slides p.3), consumer and producer surplus (Feb. 2 slides p.3), ...

## QUESTION 2: 40 points

### ALGEBRA:

Let  $P_B$  denote the price of beef and  $P_W$  the price of wine.

(a) (12 points) Derivation of absolute demands:

England's budget constraint is

$$P_B B + P_W W = 200 P_B .$$

With the Cobb-Douglas utility function and equal powers (1 each) for the two quantities, half of income is spent on each good. (Merely saying Cobb-Douglas is not enough; the quality of powers is important.) Therefore English demands are given by

$$P_B B^E = 100 P_B \text{ or } B^E = 100 ; \quad P_W W^E = 100 P_B \text{ or } W^E = 100 P_B / P_W .$$

Similarly, French budget constraint is

$$P_B B + P_W W = 300 P_W ,$$

and French demands are

$$P_B B^F = 150 P_W \text{ or } B^F = 150 P_W / P_B ; \quad P_W W^F = 150 P_W \text{ or } W^F = 150 .$$

(4 points) Relative demands: Again using the Cobb-Douglas property, or taking ratios of the absolute demands derived above, the relative demand in each country is given by  $W/B = P_B / P_W$ .

(b) Equilibrium: DEMAND AND SUPPLY ANALYSIS (6 points)

You can use any one of the methods below.

Equating the absolute demand for beef with its supply:

$$100 + 150 P_W / P_B = 200, \text{ or } 150 P_W / P_B = 100, \text{ or } P_W / P_B = 2/3, \text{ or } P_B / P_W = 3/2.$$

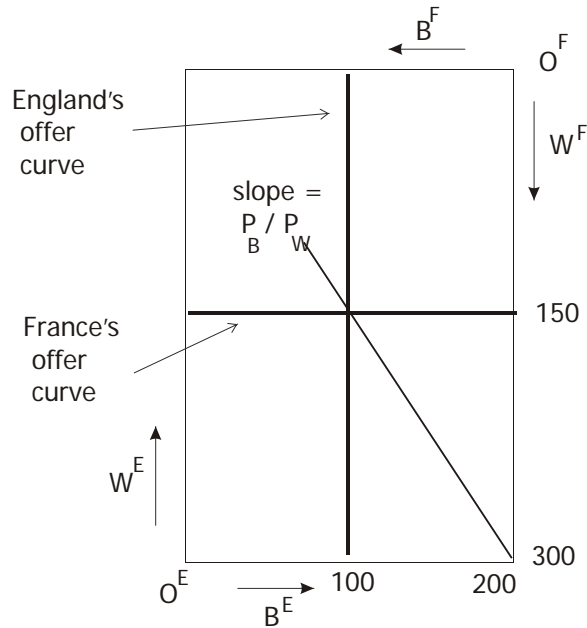
You could equivalently use the supply and demand for wine.

Or you can equate relative demand and supply. The relative demand was derived above; the relative supply is  $W/B = 300/200 = 3/2$ . Therefore in equilibrium,

$$P_B / P_W = 3/2.$$

### OFFER CURVES (15 points):

The absolute demands derived above show that, with beef on the horizontal axis and wine on the vertical, England's offer curve is a vertical straight line and France's offer curve is a horizontal straight line. The intersection, and the relative price, can then be read from the box diagram below.



(c ) (3 points) No one loses from trade. In the absence of trade, everyone would have zero utility. Under autarky, England would have zero wine and France would have zero beef. With trade, everyone consumes positive quantities of both goods so everyone has positive utility.

Additional information: If there were a few winemakers in England and a few beef farmers in France they would have lost, but there are none.

### QUESTION 3: 40 points

[A] Table of the effects of the change in the goods' relative price on the real incomes of the owners of various factors in America in the three different time-frames:

	Capital initially in		Labor initially in	
	Autos	Corn	Autos	Corn
Short run	Loss	Gain	Loss	Gain
Medium run	Loss	Gain	Ambiguous	Ambiguous
Long run	Loss	Loss	Gain	Gain

[B] Capital initially in corn: (1) gains in the short run because it is specific to the sector whose relative price has risen (note that a fall in the relative price of autos is the same thing as a rise in the relative price of corn), (2) gains even more in the medium run because some labor moves to the corn sector, raising the marginal product of corn sector capital. (3) But this gain turns to a loss in the long run because corn is relatively labor intensive, so a rise in its relative price benefits (all) labor and hurts (all) capital by the Stolper-Samuelson effect. Intuitively, this can be viewed as the result when capital

that was initially in the auto sector becomes mobile in the long run and moves into the corn sector. There is a lot of this capital coming in (the auto sector is capital intensive) and it employs a lot of labor in the corn sector (which is labor intensive); the result is a substantial rise in the wage rate, benefiting labor, and hurting the capital that was initially in the corn sector because it must now pay the high wage.

[C] Labor fares ambiguously in the medium term depending on its consumption pattern: the wage goes down but not by as much as the price of autos, therefore the wage can buy more of autos but less of corn.

[D] Only the relative price change matters to determine the change in factor prices, and that information is already supplied. Therefore the additional information about the direction of trade is irrelevant.