

Key to First In-class Exercise: Absolute v. Comparative Advantage

	Home	Foreign*	Possible production		Relative
			Home	Foreign	Productivity
Labor (hours / year)	L=600	L*=800	$L O_{LS}$	$L^* O^*_{LS}$	O_{LS}/O^*_{LS}
Shoes (pair S / hour)	$O_{LS}=6$	$O^*_{LS}=8$	3600 S/yr	6400 S/yr	0.75
			$L O_{LT}$	$L^* O^*_{LT}$	O_{LT}/O^*_{LT}
Tea (bushel T / hour)	$O_{LT}=2$	$O^*_{LT}=4$	1200 T/yr	3200 T/yr	0.5
Opportunity costs					
Tea					
O_{LS}/O_{LT} (pair S / bushel T)	3	2	Foreign has a lower opp. cost of T.		
Shoes					
O_{LT}/O_{LS} (bushel T / pair S)	0.33333	0.50	Home has a lower opp. cost of S.		

1. Use the Ricardian model of international trade to answer the following questions. The table above shows the labor productivity of each country in each industry as its output per hour of labor.

- a. Which country has absolute advantage in which good and why?

Foreign has an absolute advantage in Shoes because they can produce them more efficiently (more units per hour). Foreign produces 2 more pairs per hour than Home. Foreign also has an absolute advantage in Tea because they can produce it with fewer resources. Foreign produces bushels of T at twice the rate of Home.

- b. Which country has comparative advantage in which good and why?

Foreign has a comparative advantage in T because their opportunity cost (and “autarky” relative price, P_t/P_s) is 2 pair of S per bushel of T, while Home’s opportunity cost is 3 pair of S per bushel of T. Home has a comparative advantage in S because their opportunity cost (and autarky relative price, P_s/P_t) is 1/3 bushels of T per pair of S, while Foreign’s opportunity cost (P_t/P_s) is 1/2 bushels of T per pair of S.

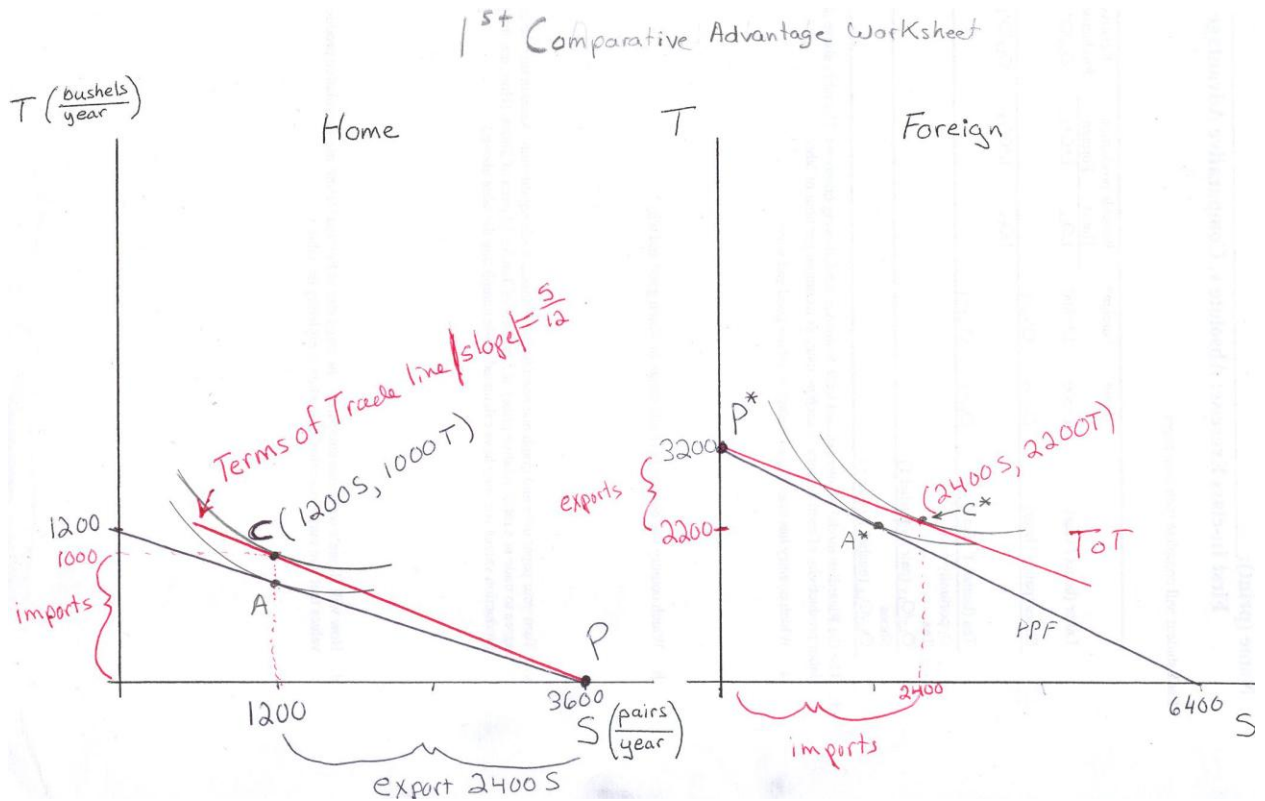
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- c. Turn your paper over and graph one possible international trade equilibrium. Assume that the countries agree to trade at a ratio (relative price) of 5 bushels of Tea for 12 pairs of Shoes. (Hint: use the possible production values you may have calculated while completing the table above.)

Foreign's autarky relative price, (P_s/P_t) is $1/2$ bushel of T per pair of S, while Home's opportunity cost (P_s/P_t) is $1/3$ bushel of T per pair of S. If trade is to benefit both countries, then $1/3 < P_s/P_t < 1/2$.

The middle of this range suggests $P_s/P_t = 5/12$ (bushel/pair) – that's the average.

Each country produces only its comparative advantage good, and trades to get the other good. One possible trade: Home exports 2400 (pair S/year) and imports 1000 (bushel T/year). Foreign imports 2400 (pair S/year) and exports 1000 (bushel T/year). In the graph, an example autarkic production and consumption point is shown as A and A* for Home and Foreign. The possible trade equilibrium is shown with production at points P and P*, and consumption at C and C*, for Home and Foreign, respectively.



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- d. How will Home's wage rate compare to the wage rate in Foreign? (Hint: use the relative productivity values that you may have calculated while completing the table.)

Foreign's workers are more productive. Therefore, they will earn a higher wage than Home's workers. The limits on the relative wage are $0.5W^* < W < 0.75W^*$, where W is the wage in Home and W^* is the wage in Foreign. That is, Home's wage must be between 0.5 and 0.75 times the wage in Foreign, because Home is 0.75 times as productive in S (its comparative advantage good) and 0.5 times as productive in T (its comparative disadvantage good).

It may help to consider a counter example: If Home's workers were paid exactly three-fourths of Foreign's wage, i.e., $W = 0.75W^*$ (say $W = \$7.50/\text{hour}$ & $W^* = \$10/\text{hour}$), then the money price of S would be identical in both countries.

Why? Remember that $P_S = MC_S = W/O_{LS} = \$7.50/\text{hour} / 6 \text{ pairs of S/hour} = \1.25 per pair of S, given our assumption of competitive markets for goods and resources. Using the same logic, it follows that Foreign's price of shoes, $P_S^* = MC_S^* = W^*/O_{LS}^* = \$10/\text{hour} / 8 \text{ pairs of S/hour} = \1.25 per pair of S.

What does this mean? It shows us that if Home's relative wage equals (or exceeds) its relative productivity in its comparative advantage good, it will lose "competitive advantage" – it won't be able to beat Foreign's price. Home would not be able to export S. Thus they could not pay for any imported T.

These limits may be derived by comparing the costs of each good across countries. We know that Foreign has a comparative advantage in T. In the long run, goods will be produced where they are less expensive to produce. As above, this implies that $P_T > P_T^*$. Given that price equals marginal cost, it follows that $MC_T > MC_T^*$. In this model, where labor is the only resource, $MC_T = W/O_{LT}$. Thus, $W/O_{LT} > W^*/O_{LT}^*$.

Rearrange this to show $W/W^* > O_{LT}/O_{LT}^* = 2/4 = 0.5$ – in other words, Home's relative wage must be greater than its relative productivity in its comparative disadvantage good. If it were less, then Home would have competitive advantage (lower price) in both goods.

The same logic applies to Home's comparative advantage good, S. $P_S < P_S^*$ implies that $W/O_{LS} < W^*/O_{LS}^*$. Rearrange this to show $W/W^* < O_{LS}/O_{LS}^* = 6/8 = 0.75$ – in other words, Home's relative wage must be less than its relative productivity in its comparative advantage good. If it were more, then Foreign would have competitive advantage (lower price) in both goods.

It is also acceptable to answer this question with a numerical example. Given $P_S/P_T = 5/12$ (bushel/pair), then it follows that $w/w^* = 5/8 = 0.625$

Why? Home's workers produce S, and earn what they produce: $O_{LS} = 6$ (pr./hr.). Foreign's workers produce T, and earn what they produce: $O_{LT}^* = 4$ (bu./hr.). Home's workers can trade their S for T at the $P_S/P_T = 5/12$ (bu./pr.). Thus, in terms of T, Home's wage is $5/2 = 2.5$ (bu./hr.) – found as $6(\text{pr./hr.}) \text{ times } (5/12) \text{ (bu./pr.)}$.

Next compute the relative wage, say $w/w^* = 2.5/4 = 5/8 = 0.625$

Note that 0.625 is within the limits on the relative wage found in the first paragraph of this answer.