

Problem Set 1: Ricardian model

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1. Using the Ricardian model, and focusing on the auto industry, explain why American workers receive higher wages than Chinese workers in the production of cars?

American auto workers receive higher wages than Chinese auto workers because the US has an absolute advantage in the production of many goods, including cars.

Recall that:

$$W = P_A * MPL_A$$

The US marginal product of labor in autos is higher than China's marginal product of labor in autos (the same happens in many other goods).

With free trade in cars, the international price will be unique (the same in the US and China).

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2. Why is the production possibility frontier a straight line in the Ricardian model?

The production possibilities frontier is a straight line in the Ricardian model because of the assumptions that:

1. Labor is the only factor of production
2. The marginal products of labor (in each sector) are constant

The Ricardian model ignores the role of other factors of production, such as land and capital. Therefore, there are no diminishing returns.

In the specific factors and HO models (covered in the next classes), there will be multiple factors of production and we will have diminishing returns.

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3. Consider the following table and assume that the total labor supply in Taiwan is 4 and the total labor supply in Vietnam is 8

	Taiwan	Vietnam
Number of phones produced per hour	10	5
Number of radios produced per hour	50	10

a) What is the opportunity cost of 1 unit of phones in terms of radios in Taiwan? In Vietnam?

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3. Consider the following table and assume that the total labor supply in Taiwan is 4 and the total labor supply in Vietnam is 8

	Taiwan	Vietnam
Number of phones produced per hour	10	5
Number of radios produced per hour	50	10

a) What is the opportunity cost of 1 unit of telephones in terms of radios in Taiwan? In Vietnam?

	Opp. Cost of 1 phone (In Terms of Units of Radio Given up)	Opp. Cost of 1 Radio (In Terms of Units of Telephone Given up)
Taiwan	$50/10=5$	$10/50=1/5$
Vietnam	$10/5=2$	$5/10=1/2$

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3. Consider the following table and assume that the total labor supply in Taiwan is 4 and the total labor supply in Vietnam is 8

	Taiwan	Vietnam
Number of telephones produced per hour	10	5
Number of radios produced per hour	50	10

b) Determine whether each of the following statements is true or false. Provide a brief explanation of why it is true or false.

(i) Taiwan has an absolute advantage in the production of both telephones and radios

(ii) Vietnam has a comparative advantage in the production of telephones

(iii) One possible production combination for Vietnam is 40 units of telephone and 80 units of radio per hour

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3. Consider the following table and assume that the total labor supply in Taiwan is 4 and the total labor supply in Vietnam is 8

	Taiwan	Vietnam
Number of telephones produced per hour	10	5
Number of radios produced per hour	50	10

b) Determine whether each of the following statements is true or false. Provide a brief explanation of why it is true or false.

(i) Taiwan has an absolute advantage in the production of both telephones and radios

TRUE: Taiwan can produce more of both goods than Vietnam

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3. Consider the following table and assume that the total labor supply in Taiwan is 4 and the total labor supply in Vietnam is 8

	Taiwan	Vietnam
Number of phones produced per hour	10	5
Number of radios produced per hour	50	10

b) Determine whether each of the following statements is true or false. Provide a brief explanation of why it is true or false.

(ii) Vietnam has a comparative advantage in the production of phones

TRUE: Vietnam has a lower opportunity cost of producing phones relative to Taiwan.

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3. Consider the following table and assume that the total labor supply in Taiwan is 4 and the total labor supply in Vietnam is 8

	Taiwan	Vietnam
Number of phones produced per hour	10	5
Number of radios produced per hour	50	10

b) Determine whether each of the following statements is true or false. Provide a brief explanation of why it is true or false.

(iii) One possible production combination for Vietnam is 40 units of phone and 80 units of radio per hour

FALSE: With a labor supply of 8, it is not possible for Vietnam to produce 40 units of phone and 80 units of radio in an hour. Instead, **two possible** production combinations include $5 \cdot 8 = 40$ units of phone per hour **or** $10 \cdot 8 = 80$ units of radio per hour.

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	Taiwan	Vietnam
Number of telephones produced per hour	10	5
Number of radios produced per hour	50	10

c) If the two countries engage in international trade, what will Taiwan produce and how many?

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	Taiwan	Vietnam
Number of telephones produced per hour	10	5
Number of radios produced per hour	50	10

c) If the two countries engage in international trade, what will Taiwan produce and how many?

Because Vietnam has the lower opportunity cost in the production of phones and hence comparative advantage in producing this good, Taiwan has a comparative advantage in the production of radios. Thus, Taiwan will specialize in the production of radios. Taiwan will produce $50 \times 4 = 200$ per hour.

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	Taiwan	Vietnam
Number of telephones produced per hour	10	5
Number of radios produced per hour	50	10

d) What is the real wage in Taiwan in terms of radio? What is the real wage in Vietnam in terms of telephone?

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	Taiwan	Vietnam
Number of telephones produced per hour	10	5
Number of radios produced per hour	50	10

d) What is the real wage in Taiwan in terms of radio? What is the real wage in Vietnam in terms of telephone?

The real wage in Taiwan in terms of radio is 50 units of radio. The real wage in Vietnam in terms of phone is 5 units of phone.

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	Taiwan	Vietnam
Number of telephones produced per hour	10	5
Number of radios produced per hour	50	10

e) Will Taiwan and Vietnam trade if the international relative price of telephone is 3? Briefly explain why and why not.

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	Taiwan	Vietnam
Number of telephones produced per hour	10	5
Number of radios produced per hour	50	10

e) Will Taiwan and Vietnam trade if the international relative price of phone is 3? Briefly explain why and why not.

Because the no-trade relative prices are 5 in Taiwan and 2 in Vietnam, two countries will engage in trade if the international relative price of telephone is 3. Vietnam will export phones because the international relative price of phone is higher than its no-trade equilibrium price. By contrast, Taiwan will import phones because the international relative price of phones is lower than its no-trade equilibrium price.

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4. Refer to the following table in answering the questions that follow. Assume each country has 100 workers.

	Australia	United States
Pounds of beef produced per hour	17	35
Bushels of wheat produced per hour	51	105

- Which country has a comparative advantage in the production of wheat?
- Using the Ricardian model, would trade between Australia and the United States be mutually beneficial? Briefly explain why or why not.
- Would your answers be different if a worker in the United States became more productive and could produce 70 pounds of beef or 140 bushels of wheat per hour?

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4. Refer to the following table in answering the questions that follow. Assume each country has 100 workers.

	Australia	United States
Pounds of beef produced per hour	17	35
Bushels of wheat produced per hour	51	105

a) Which country has a absolute advantage in the production of wheat?

The US has an absolute advantage in the production of wheat because it can produce 105 pounds of wheat per hour whereas Australia can produce 51 pounds in the same hour.

Problem Set 1: Ricardian model

4. Refer to the following table in answering the questions that follow. Assume each country has 100 workers.

	Australia	United States
Pounds of beef produced per hour	17	35
Bushels of wheat produced per hour	51	105

	Opp. Cost of 1 pound of beef (in Terms of Bushels of Wheat Given up)	Opp. Cost of 1 Bushel of Wheat (in Terms of pounds of Beef Given up)
Australia	3	1/3
US	3	1/3

b) Using the Ricardian model, would trade between Australia and the United States be mutually beneficial? Briefly explain why or why not.

Australia and the United States will not engage in trade because there are no differences in opportunity costs between the two countries, so there are no opportunities to gain from trade according to the Ricardian model.

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4. Refer to the following table in answering the questions that follow. Assume each country has 100 workers.

	Australia	United States
Pounds of beef produced per hour	17	35
Bushels of wheat produced per hour	51	105

	Opp. Cost of 1 pound of beef (in Terms of Bushels of Wheat Given up)	Opp. Cost of 1 Bushel of Wheat (in Terms of pounds of Beef Given up)
Australia	3	1/3
US	2	1/2

c) Would your answers be different if a worker in the United States became more productive and could produce 70 pounds of beef or 140 bushels of wheat per hour?

With the increase in productivity in the United States, the two countries now have differences in opportunity costs and will find trade mutually beneficial.

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5. Refer to the following table. Assume there are two workers in Mexico and three workers in the United States.

	Mexico	United States
Bottles of tequila produced per hour	7	5
Pounds of rice produced per hour	5	10

- Determine the pre-trade relative price of tequila in Mexico and the United States
- Given your answer in part (a), which country has a comparative advantage in the production of rice?
- What is the lowest international relative price of tequila Mexico is willing to accept in order to engage in trade with the United States. Briefly explain why.

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5. Refer to the following table. Assume there are two workers in Mexico and three workers in the United States.

	Mexico	United States
Bottles of tequila produced per hour	7	5
Pounds of rice produced per hour	5	10

a) Determine the pre-trade relative price of tequila in Mexico and the United States

The autarky relative price of tequila are $5 / 7$ in Mexico and 2 in the United States, respectively.

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5. Refer to the following table. Assume there are two workers in Mexico and three workers in the United States.

	Mexico	United States
Bottles of tequila produced per hour	7	5
Pounds of rice produced per hour	5	10

b) Given your answer in part (a), which country has a comparative advantage in the production of rice?

The United States has a comparative advantage in producing rice.

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5. Refer to the following table. Assume there are two workers in Mexico and three workers in the United States.

	Mexico	United States
Bottles of tequila produced per hour	7	5
Pounds of rice produced per hour	5	10

c) What is the lowest international relative price of tequila Mexico is willing to accept in order to engage in trade with the United States. Briefly explain why.

The international relative price of tequila must be at least $5/7$ in order for Mexico to engage in trade. This is because Mexico's no-trade relative price of tequila is $5/7$.