

ECON 3100

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Written Assignment 1

Due: 11:59 AM Thursday, September 19th

1. **(Ricardian Model)** Suppose the table below reflects each country's production of cheese and wine.

Output Per Worker

Output per worker	Argentina	Brazil
Cheese	1 ton	2 tons
Wine	5 casks	40 casks

- a.) Which country has an absolute advantage in producing Cheese? Which country has an absolute advantage in producing wine?

Brazil has absolute advantage in producing cheese because it produces more cheese per worker than Argentina and also more wine per worker than Argentina

Brazil- 2 tons of cheese and 40 casks of wine

- b) What is the relative price of Cheese in Argentina if it did not trade? What is the relative price of Cheese in Brazil if it did not trade?

The relative price of cheese in Argentina is 5 casks of wine per ton of cheese and the relative price of cheese in Brazil is 20 casks of wine per ton of cheese.

- c) What is the opportunity cost of producing cheese in Argentina? What is the opportunity cost of producing cheese in Brazil? Who has the higher opportunity cost?

opp. cost of cheese in Argentina = wine/cheese = 5/1 = 5 casks of wine per ton of cheese,

opp. cost of cheese in Brazil = wine/cheese = 40/2 = 20 casks of wine per ton of cheese

Therefore Brazil has the higher opportunity cost of producing cheese

- d) Which country has a comparative advantage in cheese production? Which country has a comparative advantage in wine production?

To determine comparative advantage, we compare the opportunity costs of producing cheese and wine in each country. A country has a comparative advantage in producing a good if it has a lower opportunity cost for that good compared to the other country.

Argentina:

Opportunity cost of 1 ton of cheese: 5 casks of wine

Opportunity cost of 1 cask of wine: $\frac{1}{5}$ ton of cheese = 0.2

Brazil:

Opportunity cost of 1 ton of cheese: 20 casks of wine

- Opportunity cost of 1 cask of wine: $\frac{1}{20}$ ton of cheese = 0.05

Comparative Advantage Analysis:

Cheese Production:

Argentina= 5 casks of wine per ton of cheese

Brazil= 20 casks of wine per ton of cheese

- **Argentina has a lower opportunity cost for producing cheese.**
- **Argentina has a comparative advantage in cheese production.**
- **Brazil has a lower opportunity cost for producing wine**
- **Brazil has a comparative advantage in producing wine.**

e) Assuming Argentina has 250 workers and CRS production functions, derive the PPF for Argentina. Remember to use your full employment condition combined with your two production functions. $crs = Q = A * L$ (# of workers in that industry)

250 workers * 1 ton/worker = 250 tons of cheese

250w * 5 casks/worker = 1250 casks of wine

PPF = wine = 1250 - 5 x cheese

2. **(Specific Factors Model)** Consider a stylized model where two goods are produced: wheat (agricultural goods) and cars (manufacturing goods). There are three factors of production: labor, land, and capital (machines). Wheat production requires land and labor and car production uses labor and capital.

a) What factors are specific and what factors are variable (mobile)?

Specific factors: (only used in one sector)

- Land (agriculture goods wheat)
- Capital (manufacturing car production)

Variable factors/ mobile: (used in multiple sectors)

- Labor because it can be employed in wheat and car production (agriculture goods and manufacturing)

b) Suppose Germany has an endowment of 30 units of capital and 90 units of land and France has 10 units of capital and 60 units of land. Which country is relatively more abundant in capital? Which country is relatively more abundant in land?

Germany: has a higher capital to land ratio and it is relatively more abundant in capital.

Capital to land ratio = 30 units of capital / 90 units of land = $\frac{1}{3} = 0.333$

France: lower capital to land ratio and it is relatively more abundant in land.

Capital to land ratio = 10 units of capital / 60 units of land = $\frac{1}{6} = 0.167$

c) Which product does each country export?

Because Germany is relatively more abundant in capital it will export the good that uses capital intensively so Germany will export cars (manufacturing goods)

And France is relatively more abundant in land so it will export the good that uses land intensively so France would export wheat (agricultural goods)

d) When the countries open up for trade, what happens to demand for cars produced in Germany? What happens to the demand for wheat produced in Germany? How do you think this impacts the return to capital and land in Germany? Remember when we say the return to capital, we mean what happens to the income of the people who

own the capital or the people who own or rent the land. In most market economies, the owners of the capital are the people who own the company which can be the owners (the proprietors) or the owners of stock. The people who own the farmland hire employees to work on the farm and they receive the difference between the sale price and the cost of labor.

Demand for cars:

Opening up for trade will increase the demand for cars produced in Germany because of their comparative advantage and leads to higher returns of capital, the income of capital increases.

Demand for wheat:

because Germany does not have a comparative advantage in wheat production the demand will decrease so they would have low returns for land, landowner's income decreases.

- e) When the countries open up for trade, what happens to demand for cars produced in France? What happens to the demand for wheat produced in France? How do you think this impacts the return for capital and land in France?

Demand for cars:

Opening up for trade will decrease the demand for cars produced in France because they are relatively less abundant in capital which leads to lower returns for capital so the income of capital owners decreases.

Demand for Wheat

Because France has a competitive advantage in wheat production the demand for wheat will increase and lead to higher returns for land therefore the income of landowners increases.

3. **(Specific Factors Model)** Let's use this same model and make it a little more relevant to current topics. Let us again consider two countries: Mexico and the United States. The countries produce two goods: cars and computers. The assembly of cars requires capital and low-skilled workers and the production of computers requires capital and high skilled workers.

- a) What factors are specific and what factors are variable (mobile)?

Specific factors:

- Low skilled workers (car production)
- High skilled workers (computer productions)

Variable/ Mobile:

- Capital (car production & computer production)

- b) Suppose Mexico has an endowment of 20 high-skilled workers and 80 low-skilled workers and the US has 150 high-skilled workers and 100 low-skilled workers. Which country is relatively more abundant in low-skilled workers? Which country is relatively more abundant in high-skilled workers?

Mexico: relatively more abundant in low skilled labor workers, less job opportunities

- High skilled workers: 20
- Low skilled workers: 80

Ratio of high skilled to low skilled workers= $20/80=0.25$

U.S. relatively more abundant in high skilled labor workers, more job opportunities and higher wages

- High skilled workers: 150

- Low skilled workers: 100

Ratio of high skilled to low skilled workers= $150/100=1.5$

- c) Which good do you think is likely to export? Which good is the US likely to export? How does this impact low-skilled workers in Mexico? How does this impact low-skilled workers in the US? How are high-skilled workers in both countries impacted?

Mexico has a comparative advantage in producing goods that use low skilled labor intensively so because car production relies on low skilled labor Mexico is likely to export cars.

The U.S. has a comparative advantage in producing goods that use high skilled labor intensively so because computer production relies on high skilled labor the U.S. is likely to export computers.

- d) Why do you think the auto industry in the US and the UAW were in favor of renegotiating the North American Free Trade Agreement?

To reduce issues, protect the market shares, improve wage standards, incentivize production and investment all in the U.S and promote a better fair trade in North America.

- e) About 25 percent of Mexico's exports to the US are auto parts and roughly 47 percent of Mexico's market share of robotics, sensors and similar equipment comes from the US. Is this consistent with our model?

Yes because it shows how each country holds their comparative advantage with the U.S. specializing in high skilled labor intensive production high tech and Mexico specializing in low skilled labor intensive production

5. **(Heckscher-Ohlin Model)** According to the following table, which country is relatively more labor abundant? Explain your answer. Which country is relatively more capital abundant?

	United States	Canada
Capital	60 machines	10 machines
Labor	360 workers	80 workers

- a) If the two goods produced in this economy are breakfast pastries and mopeds and the production of mopeds is relatively more capital intensive and breakfast pastries are relatively more labor intensive. What goods would you expect the US to export? What good would Canada export? Explain.

United States:

Capital= 60 machines

Labor= 360 workers

Capital to labor ratio (K/L): $60/360 = \frac{1}{6} = 0.167$

Canada:

Capital= 10 machines

Labor= 80 workers

Capital to labor ratio (K/L)= $10/80 = \frac{1}{8} = 0.125$

- The United States has a higher capital to labor ratio compared to Canada (0.167)
- The U.S. is relatively more capital abundant and is likely to export goods that are capital intensive (Mopeds)
- Canada is relatively more labor abundant and will likely export goods that are labor intensive (Breakfast pastries)
- Labor intensive- Breakfast pastries
- Capital intensive- Mopeds

b) If pastries are on the Y axis and mopeds on the X axis, draw the PPF for each country, and the direction of the shift in production that each country experiences from an autarky position (similar to the graphs shown in class)

