Date: 01.14.02

Comparative Advantage and the Gains from Trade

I. Why Countries Trade

A. Price difference

If the price for the same thing is different in 2 countries, it provides and incentive for trade to occur. But, it does not indicate that trade will necessarily occur because trade barriers and/or transportation costs may prevent it.

Note that there are 3 different ways that trade could occur in a simple example involving a product available both in the US and in Canada, where the Canadian good is much cheaper.

-a consumer from the US could travel to Canada and purchase the good
-a producer from Canada could come to the US and sell the product
-a third party could travel to Canada, purchase the goods, and then resell them in the US at the higher price.

These illustrate incentives demonstrating why trade will occur, as long as trade barriers or transportations costs are not prohibitive. Note that in all three examples, the resulting trade has the good being exported by Canada to the US, which means it is also being imported by the US from Canada.

Example: countries A & B, $P_A < P_B$ for a single good, implies there will be trade from A (exporting) to B (importing) for this good if
(costs of trade) < (P_B-P_A).
When will a price for a good in one country be higher or lower than in another?

See Figure 1.

$Q_M = Q_X$ in equilibrium, exports equal imports.
If the transport costs between countries are zero and there are no barriers to trade, people will keep trading until there is no longer a price difference.

We can use producer and consumer surplus in order to quantify the benefits and costs to market participants.
Country A: Consumers lose because $P_W > P_A$. We can measure how much their welfare decreased by examining the change in their consumer surplus. The change in consumer surplus is the area to the left of the demand curve between the two prices (A). Suppliers gain by the amount of the change in producer surplus, the area to the left of the supply curve between the two prices (A + B).
Losses + Gains = -A+A+B=B. Country A gains from trade.
Country B: Suppliers lose because there is a fall in price, they lose producer surplus (C). Demanders gain some consumer surplus (C + D).
Loses + Gains = -C +C+D=D. Country B gains from trade.

Everyone in each country does not enjoy the gains from trade, as some people (consumers in country B and suppliers in country A) are made worse off.

However, the amount lost by persons in each country is outweighed by the amount gained. This provides an explanation as to why there may be support for restrictions on trade: often suppliers do not want to face international competition because they may be harmed.

What determines prices?

1. Productivity: how much is a country able to produce or how much output can you get out of your labor force.
2. Price of labor or the wage could cause the price of goods to be high.
3. Exchange rates.
   In our model, both the wage and exchange rate will affect all goods within a nation equally, so what really determines trade is differences in relative productivities

II. Ricardian Model

2 goods: Food, Cloth
2 countries: US, UK
1 factor: Labor
Constant Labor Requirements: the amount of labor required to produce a unit of a good does not vary with the amount that is produced.

Table 1	US	UK
Food (hrs/lbs)	0.01	0.02
cloth (hrs/yd)	0.02	0.01
endowment(labor hours)	10	10

Table 1 says that in one hour US workers can produce 100 lbs of food or 50 yds of cloth. The UK is more productive in cloth production than the US, while the US is more productive in food. Thus, the US has an absolute advantage in food, and the UK has an absolute advantage in cloth.

What could happen if these countries did not trade (autarky)?
Autarky equilibrium (production and consumption):
This is a possible equilibrium, not THE equilibrium.

Table 2	US	UK
Food(lbs)	400	300
Cloth(yds)	300	400

All labor is being used in this equilibrium (as it must).

With trade there will be specialization according to absolute advantage.

Table 3 (production)	US	UK
Food (lbs)	1000	0
Cloth (yds)	0	1000

(Remember, we don't have enough information to solve for an exact equilibrium, we are only considering a possible equilibrium).

Table 4 (consumption with trade)	US	UK
Food (lbs)	500	500
Cloth (yds)	500	500

In Table 4 we see that the UK and US exchange 1 lbs of food for 1 yard of cloth. Consumption has risen for every good in every country from its autarky levels. This indicated that both nations are better off under trade (assuming that only the amount of consumptions matters for well-being).

Comparative Advantage

David Ricardo realized that nations could still gain from trade even without absolute advantage. Suppose the world consists instead of the US and a different hypothetical country, UC:

Table 5	US	UC
Food (hrs/lbs)	0.01	0.2
cloth (hrs/yd)	0.02	0.1
endowment(labor hours)	10	100

Notice that UC does not have an absolute advantage in anything and that the US has an absolute advantage in everything. US workers are 20 times more productive in food than UC workers and 5 times as productive in cloth.

Consider the same autarky equilibrium presented in Table 2 replacing the UK with UC, this is Table 6.

Table 6	US	UC
Food(lbs)	400	300
Cloth(yds)	300	400

Again, under trade we can have specialization, this time following comparative advantage. The US specializes in Food, the UC in cloth. In Table 7 we see that UC gained from trade even without an absolute advantage in anything.

Table 7 (consumption with trade)	US	UK
Food (lbs)	1000	0
Cloth (yds)	0	1000

This is the same trading equilibrium the US and UK were in previously. Specializing according to comparative advantage implies putting resources where their relative return is highest or where the relative disadvantage is smallest. If a nation specializes in the "wrong" industry they will lose from specialization.

Suppose the countries share the same currency (eliminating concerns about the exchange rate) and the same wage = $10/hour. Autarky prices are then given in Table 8.

Table 8 (autarky prices)	US	UK
Food	$0.10	$2.00
Cloth	$0.20	$1.00

Prices of both goods are lower in the US than UC. Will the US export everything? NO. Someone in the UC has to buy the exported goods, but if they produce nothing, they won't have any money with which to buy the goods. In this situation, there is an excess supply and markets do not clear, we have disequilibrium. In order to have an equilibrium wages must change.

One way to reach an equilibrium is for the wage in UC to fall. How far does it have to fall in order for equilibrium to be possible? Well, for example, if the wage in UC were $1/hour, the price of cloth in the UC would be $0.10, allowing them to compete in cloth. However, in order to be able to just compete, the wage would only have to fall to $2, where the price of cloth would be $0.20.
The idea is that one of the prices in UC must be equal to or lower than the US price in order for there to be an equilibrium in trade. We also know from above, that one country having lower prices for all goods does not allow for equilibrium. This implies that we don't want the prices of UC goods under autarky to drop too much (which is the same as the wage dropping too much). So, how low could the wage go and still allow for equilibrium with trade? If the wage falls to $0.50/hour in UC, the prices in UC under autarky are $0.05 and $0.10 for food and cloth, respectively. If the wage falls any further, we get disequilibrium, where UC exports everything and there is excess supply.

From the example above we see that as wages fall, the first good that becomes competitive is the one with comparative advantage.

Suppose the wage in UC with trade is $1.50/hour. What will happen?

Table 9 (prices)	US	UK
Labor($/hr)	$10	$1.50
Food ($/lbs)	$0.10	$0.30
Cloth ($/yds)	$0.20	$0.15

Trade Prices are Food $.10 and Cloth $.15 with complete specialization.

To further examine the effects of trade we can examine real wages.

Table 10 (1hr of labor can buy…)	US(autarky)	US (Free Trade)	UC (autarky)	UC (Free Trade
Food (lbs)	100	100	5	15
cloth (yds)	50	67	10	10

Table 10 shows how many units of food or cloth an hour of labor can buy in each country under autarky and with free trade. We see that real wages have risen in both countries relative to autarky (they both can get something cheaper from abroad).

Note that low productivity implies a low wage and that this low wages allows for competition that could not occur if less productive workers were paid the same wage as workers with higher productivity.
The flipside of this is that workers in more productive nations are paid higher wages. Often they feel they can't compete with workers with lower wages in other countries, forgetting that the lower wage is because of lower productivity. Thus, higher productivity allows high-wage workers to compete with lower-wage workers.

Figure 1