Absolute and Comparative Advantage

Adam Smith's Theory of Absolute Advantage

The trade theory that first indicated importance of specialization in production and division of labor is based on the idea of *theory of absolute advantage* which is developed first by Adam Smith in his famous book *The Wealth of Nations* published in 1776. Later on David Ricardo in his book titled *On the Principles of Political Economy* published in 1819 extended it to incorporate theory of comparative advantage and showed that it is the basis why nations need to trade and why trade is mutually beneficial to countries.

Absolute Advantage: If a country or individual absolutely more efficient at production of a good than another country or individual, then we say that she has absolute advantage in the production of that good.
Comparative Advantage: If a country or individual is relatively more efficient in the production of a good than another country or individual then we say that she has comparative advantage in production of that good. Comparative advantage measures efficiency in terms of relative magnitudes.
Since countries have limited resources and level of technology they tend to produce goods or services in which they have a comparative advantage. Comparative advantage (from now on CA) implies an opportunity cost associated with the production of one good compared to another. That is why countries tend to specialize in production of certain products. This notion is called international division of labor.

Smith's Model

Assumptions

- Factors of production cannot move between countries. This assumption excludes the possibility of migration between countries, as well as presence of multinational companies. It also imply that the PPF of each country will not change after the trade and there is no reason to expect wages (measured in the same currency) be the same after trade.
- No barriers to trade in goods.
- Exports must be equal to imports. This assumption means that we exclude trade imbalances, trade deficits or surpluses.
- Labor is the only relevant factor of production.
- Production exhibits constant returns to scale.

To illustrate the idea of absolute advantage (AA) consider the following table which gives the labor hours required to produce one unit of C and W in our hypothetical countries A and B.

	A	B
Cheese	2	10
Wine	8	4

Country A has AA in production of C as it takes fewer hours to produce a unit of C in A than in Country B. Since it takes less hours in Country B to produce W, Country B has an AA in production of W.

Adam Smith's theory: Countries should specialize in the production of goods in which they have an AA.

So Country A will be better of it specializes in the production of C and Country B will be better off if it specializes in W. So they don't need to produce both goods at home.

Ricardo's Model

Adam Smith's theory says that countries will be better off in specializing the good at which they have AA. But what happens if one of the countries has AA in production of both goods? Should they abandon trade?

Consider the following example:

	A	B
Cheese	6	12
Wine	2	18

In this example, Country A has AA in production of both C and W. The answer to above question comes from David Ricardo's theory of comparative advantage which says that Country A has a CA in a good if the good has a lower relative price in autarky than is found in the other country. This theory indicates that we need to look at the cost of product in each country before the trade (in autarky) and compare it with trade situation and compute gains/losses from trade. That way we can better understand the pattern of trade between two countries, and be able to answer questions like why does it makes sense for a country to export say cheese and import wine or vice versa. In the example above, Country A is 2 (12/6) times more efficient in production of C than Country B, while 9 times more efficient in production of W. Thus Country A has more AA in production of

W compared to C. So, if trade takes place Country A will tend to produce more W as W is *relatively* cheaper in Country A than in Country B.

What about Country B? According to theory of comparative advantage Country B should expand its production of C as the cheese production in Country B is relatively less costly. How do we know this? We compare autarky relative prices. What is the relative price of W in autarky in Country A and Country B?

$$(\frac{P_W}{P_C})_A = \frac{W_A * 2}{W_A * 6} = 1/3 = 0.33$$

Similarly, the relative price of W in Country B is:

$$(\frac{P_W}{P_C})_B = \frac{W_B * 18}{W_B * 12} = 3/2 = 1.5$$

So in autarky, W is cheaper in Country A than in Country B. Taking the reciprocals of above relative prices we find the relative price of C in terms of W in Country A and Country B respectively. As you can easily verify, C is cheaper in Country B than in Country A. Recall that along PPF of each country relative price gives the opportunity cost. Hence, in autarky, opportunity cost of W in Country A is lower than that in Country B, indicating that Country A's producers are relatively more efficient in W rather than in C. The opposite holds true for B's producers. According the law of comparative advantage once trade allowed between the two countries, Country A should specialize in W and Country B in C. For illustration of the outcome in terms of world output of W and C, suppose that Country A produces 1 less unit of C and Country B 1 less unit of W. The result is shown in the following table.

	Per unit gain	
	in prod. of C	in prod. of W
in A	-1	+3
in B	+1.5	-1
in world	+0.5	+2

General Equilibrium of Ricardian Model

Assume that the labor endowments are, LA = 3000 hours and LB = 5400 hours.

1. Autarky Equilibrium

In autarky competitive behavior will lead to the general equilibrium solutions be along each country's PPF.

2. Trade Equilibrium

So far we know that pre-trade price of W is lower in Country A than in Country B while the pre-trade price of C is lower in Country B than in Country A.

Q. Can these price differentials exist if two countries trade with each other?

A. No. With free trade, demand for W will rise in A and fall in B. Hence, the relative price of W will begin to rise in A and fall in B. Similarly, demand for C will fall in A and rise in B while the relative price of C ($PC=PW$) will fall in A and rise in B. This process will continue until a new equilibrium is reached in which there is no excess demand or supply for any of the goods. This new equilibrium is the *international trade equilibrium*.

In the trade equilibrium, the price that clears world markets for a particular product is called the *terms of trade*. It is the price at which exchange of W and C will take place in our hypothetical two-country, two-good world. The range of terms of trade of trade for W (relative price of W in trade equilibrium) will be (0.33, 1.5).

The after trade relative price of W is higher than the autarky price in Country A and lower than the autarky price in Country B. At this new price, producers in Country A can sell (to consumers from both A and B) one bottle of W in exchange of 1 pound of C instead of exchanging it with 1/3 pounds of C. Country A's producers will expand their W production, while Country B's producers shrink it and expand their C production as they can exchange 1 pound of C by 1 bottle of W (instead of 2/3 bottles of W). Country A's C producers will observe that relative price of C becomes lower than 3 and hence cut the production of C. Similarly, B's producers of W cut their W production. This process will end eventually whenever no excess demand or supply left out in both industries. Given the assumption of COCs, this process will end when Country A specializes completely in production of W and Country B in production of C.

Result: Under assumptions, free international trade leads each country to specialize completely in the production of its comparative-advantage good. The production of lower autarky price good expands, hence trade follows the law of comparative advantage.

Country A country's PPF illustrates how much the residents of a country wants to trade at a given world price. Its sides tell us how the desired exports and imports for a given TOT which in turn determined by the absolute value of the slope of the hypotenuse of the triangle. Walras Law If there are n markets and n-1 of them are in equilibrium then the nth one should be in equilibrium as well.

This law indicates that the market forces will bring the nth market into equilibrium. In international economics the process through which the demand and supply interacts and obtains equilibrium is known as *reciprocal demand*.

Gains from trade

The gains from trade can be illustrated in two ways. One way is to compare the consumption levels in autarky and in trade. As shown in the following graph country A's trade consumption level is higher than in autarky as the *CIC*1 lies above *CIC*0. In autarky produce and consume at 'a' but in trade specialize in W and produce at 'b' and for each bottle of one sold receive 1 pounds of C rather than 1/3 pounds. This way increase the level of consumption of both goods by consuming at c.

Wages and trade

What is the relationship between international trade and payments to factors of production? In the Ricardian model we have assumed that labor is the only factors of production. So we need to understand the relationship between wages and the trade? Recall that we have also assumed that perfect competition in product and factor markets. Hence in autarky following equations should hold:

$$P_{C,A} = W_A * L_{C,A} = W_A * 6$$

$$P_{W,A} = W_A * L_{W,A} = W_A * 2$$

$$P_{C,B} = W_B * L_{C,B} = W_B * 12$$

$$P_{W,B} = W_B * L_{W,B} = W_B * 18$$

All prices and wages are expressed in local currency. For trade to occur along the lines of comparative advantage it must be that when measured in the *same currency,* the pre-trade money price of a country's comparative advantage good is less than or equal to the pre-trade money price of that good in the other country. Suppose this holds true for both W and C. That is both W and C are cheaper in one country in the autarky. Then following conditions must hold:

$$P_{W,A} < S * P_{W,B}$$

and

$$P_{C,A} > S * P_{C,B}$$

where *S* stands for the exchange rate that translates units of Country B's currency into units of Country A's.