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Why Countries Trade: The Theory of Comparative Advantage

Increasing Trade

We live in an increasingly global economy. World merchandise exports as a share of world gross domestic product (GDP) have almost tripled since 1950, when they were 5% to 6%. Throughout most of the post–World War II period, trade has grown faster than output, and economies have become more open and integrated, especially since the 1990s. Despite the focus on globalization issues in recent years, not all aspects of globalization are unprecedented. As a matter of fact, before World War I, the world experienced significant international trade flows as well. Even so, trade liberalizations are not uncontroversial. Especially since the financial crisis of 2007, there has been renewed skepticism about the gains from trade liberalizations in the public domain, and a call for more protectionism, especially in the United States. Questions have arisen as to whether international trade is responsible for (most of) the rising income inequality, how it relates to the degradation of the environment, and whether trade undercuts labor standards. These concerns notwithstanding, economists often tend to defend free international trade with the theory of comparative advantage. Central to their defense is the belief that the gains from international trade are such that, at least in principle and in the long run, all parties involved can be better off. In this note, the basic theory of comparative advantage is presented with an example that drives home its basic logic when there are technological differences between countries. In addition, we look at some extensions that specify other sources of comparative advantage, as well as some of the limitations of the theories.

Comparative Advantage

When Nobel laureate Paul Samuelson was asked to name one of the most important concepts in economics, he answered, "comparative advantage." It is a surprisingly common-sense idea, but it is often misunderstood. Comparative advantage tells us why we purchase virtually all goods that we consume in our daily lives instead of producing them ourselves. For instance, most of us buy clothes from stores and cars from car dealerships instead of making them ourselves. In other words, we specialize in what we do, and the jobs that we have, in many instances, reflect what we are best at doing. Michael Jordan became a basketball player and not a house painter because he was so much better at playing basketball than at painting houses. It is immaterial whether Michael Jordan is potentially better at painting houses than a regular house painter. The point is that he is, relative to house painting, so much better at basketball than the house painter. The same logic applies to countries. Advanced countries as well as developing countries should specialize. Advanced countries should produce more high-tech products than they consume, and trade (export) these for the relatively standard textile products that developing countries produce. When countries specialize and trade,

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world production is organized efficiently. With international trade, the pie is bigger (more goods are produced), and everyone can be better off. Ultimately, this increased efficiency of world production is what generates the gains from trade.

Technology as a Source of Comparative Advantage: An Example

Imagine a world with only two countries, Spain and Holland. Both countries produce and consume two goods: wine and cheese. **Figure 1** shows the production possibility frontier of each country. It indicates how much each country can produce if it optimally uses all its labor force. We assume that Spain has 180 workers and Holland has 18 workers. For simplicity, we assume that only labor is needed to produce wine and cheese, and countries are not equally productive in either sector. If Spain used all its labor to produce wine, it could make 18 gallons of wine. If all its labor were active in the cheese sector, it could produce 12 pounds of cheese. As one can see, Holland's production possibility frontier is different from that of Spain. It is much steeper. From the data, we can infer that it takes 10 workers (180/18) to produce one gallon of wine in Spain and 15 workers (180/12) to produce a pound of cheese. Holland is overall much more productive. Only 3 workers are needed to produce a gallon of wine (18/6) and 1.5 workers per pound of cheese (18/12).

Figure 1. Production possibility frontier = consumption possibilities before trade.

Source: Created by author.

The key difference between Spain and Holland is that at any level of production the opportunity cost of producing wine in terms of cheese is not the same. (Another way to say this is that the relative price of one good in terms of the other is unequal.) Spain forgoes 2/3 of a pound of cheese (12/18) for every additional gallon of wine it produces—this is the opportunity cost of wine in Spain (the opportunity cost of cheese is the inverse of that: 3/2). Alternatively, Holland forgoes two pounds of cheese for each gallon of wine it wants to produce. A country is said to have a comparative advantage in the good that has the lowest opportunity cost in terms of the other good. Clearly, the opportunity cost of wine in terms of cheese is lower in Spain than in Holland, so Spain is much more efficient in producing wine compared with cheese than Holland. We say that Spain has a comparative advantage in producing wine and Holland a comparative advantage in cheese.

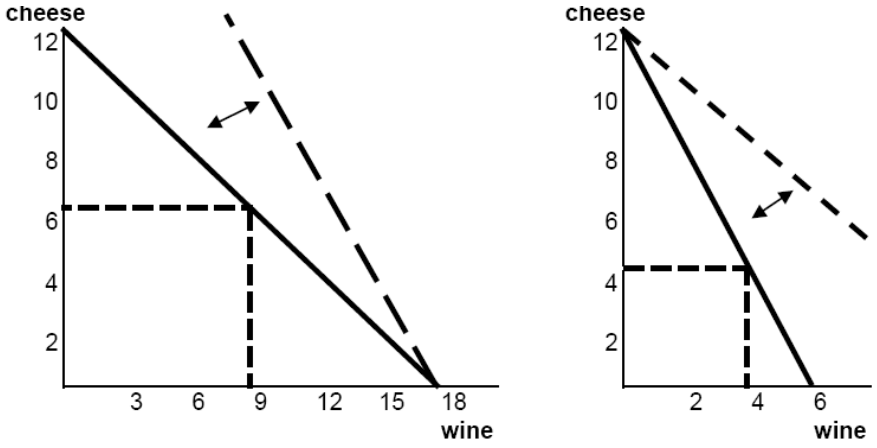
When neither country is trading, its consumption options are limited to the downward-sloping line in **Figure 1**, called the country's production possibility frontier. Countries can consume only what they produce.

Note that the specific point of consumption on the production possibility frontier will be determined by how much consumers care about wine versus cheese. Without trade, the prices of cheese and wine will be different in Spain and Holland. If preferences are similar in both countries, we expect Spain to consume more of the relatively cheap (compared to cheese) wine and less of the relatively expensive cheese than in Holland, where cheese should be relatively cheap and wine relatively expensive.

A key insight of David Ricardo, who developed the theory of comparative advantage, was that differences in opportunity costs and relative prices determine the pattern of trade. When both countries trade, and there are no transportation costs, they face the same prices in international markets, and these prices differ from the domestic prices before trade. Consumers realize they can be better off if they export the good with the comparative advantage (i.e., relatively cheap before trade) and import the other good (i.e., relatively expensive before trade). In particular, Spain realizes that Holland is not so good at producing wine (in terms of cheese) as it is. Therefore, even if the Dutch pay less for wine (relative to cheese) than they had paid *before* trade, they would still be paying *more* than the Spanish had paid for wine before trade. In the extreme, if the Dutch were willing to trade at their domestic price before trade, the Spanish could get up to two pounds of cheese for each gallon of wine they exported. As a matter of fact, so long as the Dutch are willing to pay more than the initial domestic price of wine in terms of cheese (2/3), trade would make Spain better off. (The reverse is true for Holland.) This key insight induces specialization of production: both countries will produce more of the good in which they have a comparative advantage (and export it), and they will produce less of the other good (and instead import it).

With complete specialization (in this example, Holland produces *only* cheese, and Spain produces *only* wine), it is easy to see that both countries will be better off with trade. For one, the total world production of cheese and wine will be maximized, so the pie is larger. Take a look at **Figure 2** for Spain. In case Spain only produces wine, it produces 18 gallons of wine and no cheese (18, 0). It then sells its total wine production (18, 0) at an international price (in terms of cheese) that is higher than the 2/3 pound of cheese per gallon of wine that it got at home before trade. This makes the dashed line that goes through (18, 0), which represents the consumption possibilities in **Figure 2**, steeper than the production possibility frontier. What is clear from **Figure 2** is that international trade implies that the total set of consumption options is more attractive than before, when Spain's consumption was limited to the points on the initial production possibility line. The same is true for Holland. Note that the international price of wine in terms of cheese has to lie in between the respective prices of the two countries before they traded.

Figure 2. Consumption possibilities versus production possibility frontier with trade.



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