

<b>Chapter</b>	<b>30</b>
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**TRADE WITHOUT MONEY****Key Topics**

absolute advantage  
comparative advantage

**Goals**

understand gains from trade

So far, our concern has been with the production, distribution, and consumption within one country. We well know that the world consists of more than one country and that trade between countries frequently makes the news. However, the idea of trade does not apply just to countries; trade occurs between individuals, too. You are already familiar with the idea of trade. As a child you may have traded baseball cards, comic books, or stickers, or played one of the many board games that are designed around the idea of trade — Monopoly is the most famous of these. And now nearly every day you trade your money for goods and services. So you are already acquainted with trade. We will now have a closer look at this universal activity.

In this chapter, we will ignore the complicating fact that there are many different currencies. We will first consider a world without money. To discover the gains from trade, we begin with the idea of absolute advantage. Absolute advantage will then be distinguished from comparative advantage. In the next chapter you can apply this knowledge of trade to a world with money and become better acquainted with the process of international trade.

***Absolute Advantage***

Let us start with two countries (or individuals), both producing the same two goods. The countries are Cal and Oh, and they each produce oranges and glass. The oranges of one country cannot be distinguished from the oranges of the

**Table 30-1 Absolute Advantage, One Good**

	Oranges	Glass
Cal	10	1 ton
Oh	5	2 ton

This table shows the amount of each good each country can produce with the same amount of resources. Cal has the absolute advantage in oranges and Oh in glass.

other country, and similarly for glass. The opportunities for trade are apparent since one country is superior in the production of oranges and the other in glass. Each country has an absolute advantage. **Absolute advantage** means the ability of a country to produce a larger quantity of a good with the same amount of resources as another country. The country's absolute advantage may be due to the nature of its resources or to its production skills.

Suppose that we are given the information from Table 30-1 about production in each of our two countries. The first country, Cal, can produce 10 oranges or 1 ton of glass using a given amount of inputs. The second country, Oh, can produce 5 oranges or 2 tons of glass with the same amount of resources. Cal has an absolute advantage in oranges, and Oh has an absolute advantage in glass. Cal can produce 10 oranges compared to 5 for Oh, while Oh can produce 2 tons of glass compared to 1 for Cal. Obviously Cal would choose to specialize in the production of oranges and Oh in the production of glass. The question is, can these countries gain by trading?

Suppose that 3 oranges trade for 1 ton of glass. What if the people of Oh use their resources to produce 2 tons of glass and then trade their glass to the people of Cal for oranges? Oh would get 6 oranges back. The people of Oh would be 1 orange ahead, since if they did not trade with Cal, at best they could have produced only 5 oranges with the same amount of resources. The people of Cal are also better off having produced oranges. They traded 6 oranges but gained 2 tons of glass. So they now have 2 tons of glass and the remaining 4 oranges. If they did not trade with Oh, the resources used to produce 10 oranges produce but 1 ton of glass instead. So Cal is 1 ton of glass and 4 oranges ahead compared to if it had not produced oranges and traded.

This example suggests that both countries gain by trade. Observe that there is no reason to expect the gain to be shared equally. But both countries have more than if they had not specialized and traded. By specializing in the production of one good, and then trading, each country can have more than

by producing both goods itself. In the example given here, this result is not too surprising. After all, Cal is the more efficient producer of oranges, and Oh is the more efficient producer of glass. What about a situation where one country is more efficient in the production of all goods, and therefore has the absolute advantage in both? This means that the other country has no absolute advantage. Will specialization and trade make sense then?

### **Comparative Advantage**

Suppose that we have the same two countries as before but that conditions have changed somewhat. Cal is able to produce 10 oranges or 2 tons of glass with a given amount of resources. Oh can produce 3 oranges or 1 ton of glass. Look at Table 30-2. You can see that Cal has an absolute advantage in producing *both* oranges and glass. Will specialization and trade still occur? It is not so obvious now. Suppose that the terms of trade, the rate at which oranges trade for glass, is 4 oranges for 1 ton of glass. What about Oh? Although it has no absolute advantage, if Oh produces a ton of glass it could trade the glass for 4 oranges. It would have 1 orange more than if it had produced oranges. Oh would be ahead. What about Cal? Cal, being the more efficient producer of both oranges and glass, would not seem able to gain from trade. Yet when Cal produces 5 oranges, it gives up 1 ton of glass. It could exchange 4 of those oranges for 1 ton of glass and be 1 orange ahead. So specialization and trade still make sense even when one country has an absolute advantage in the production of both goods.

The possibilities for trade are not determined by how efficiently a good can be produced. What matters is the opportunity cost of producing each good. A country has a **comparative advantage** in the production of a good if its opportunity cost for the good is less than the opportunity cost for the same good in another country. Table 30-3 shows that the opportunity cost of glass in

**Table 30-2 Absolute Advantage, Two Goods**

	Oranges	Glass
Cal	10	2 ton
Oh	3	1 ton

This table shows the amount of each good each country can produce with the same amount of resources. Cal has the absolute advantage in both oranges and glass.

terms of oranges is 5 for Cal (Cal gives up 10 oranges to get 2 tons of glass) and 3 for Oh (Oh gives up only 3 oranges to get 1 ton of glass). These different opportunity costs make possible gains from trade. Relatively, compared to Cal, Oh is the more efficient producer of glass. Oh gives up fewer oranges than Cal to obtain 1 ton of glass. Notice that Oh does not have an absolute advantage, but a comparative advantage in glass production. Oh sacrifices fewer oranges, 3, than Cal, 5, to obtain a unit of glass.

Since Oh has the comparative advantage in the production of glass, Cal will have the comparative advantage in the production of oranges. Table 30-4 shows that the opportunity cost to Cal of producing an orange is 1/5 of a ton of glass, for Oh, 1/3 of a ton of glass. Since 1/5 of a ton of glass is less of a sacrifice than 1/3, Cal sacrifices less glass to produce oranges than Oh. Relatively, compared to Oh, Cal is the more efficient producer of oranges. We see that since Oh has the comparative advantage in glass, and Cal in oranges, there is the possibility for specialization and trade, and the potential of gains from trade.

So it is not absolute advantage but comparative advantage that is the key to specialization and trade. What matters is not which producer can make the

**Table 30-3 \*Comparative Advantage, Glass**

Opportunity cost of producing 1 ton of glass	
Cal	5 oranges
*Oh	3 oranges

This table shows the amount of oranges that each country must give up to produce 1 ton of glass. These opportunity costs are based on the production data in Table 30-2. Since Oh has to give up fewer oranges than Cal, Oh has the comparative advantage in producing glass.

**Table 30-4 \*Comparative Advantage, Oranges**

Opportunity cost of producing 1 orange	
*Cal	1/5 ton of glass
Oh	1/3 ton of glass

This table shows the amount of glass each country must give up to produce one orange. These opportunity costs are based on the production data in Table 30-2. Since Cal has to give up less glass than Oh, Cal has the comparative advantage in producing oranges.

good more cheaply, but which can make the good *relatively* more cheaply. The opportunity cost for one producer must be compared to the opportunity cost for the other. Comparative advantage is less obvious than is absolute advantage but is the factor determining specialization and trade. Whether or not trade occurs depends on the opportunity cost, not on how many resources go into the production of a good. A good may require a larger amount of resources in one country and still be produced for trade. The country would specialize in that good if the opportunity cost is lower than for the other country. So even if one producer is less efficient in all production, there still remains the opportunity for both to benefit from trade. Keep in mind that the principle of comparative advantage applies equally to individuals as it does to nations. It tells individuals what to specialize in and trade, and nations what to import and export.

### ***Potential for Trade***

Examples of absolute advantage are plentiful. Suppose that there is a person who can make excellent furniture and another who can fix cars. It seems reasonable that the one who can fix cars will fix the cars for both and that the furniture maker will make the furniture for both. Examples of comparative advantage also abound. What if one person can make furniture and fix cars better than the other? Will the one do both jobs? The answer is no. Each person will specialize in the activity in which he or she has a comparative advantage. Both parties gain by this arrangement, and both can have more with trade than if they did not specialize. So the fact that people choose careers and specialize in that activity is due to comparative advantage. Comparative advantage, specialization, and trade make the output of the society larger than it would have been without trade.

Notice, however, that trade between Cal and Oh will only occur if the terms of trade of oranges for glass falls between the opportunity costs. In Table 30-2, the opportunity cost of 1 ton of glass is 5 oranges for Cal, and the opportunity cost of 1 ton of glass is 3 oranges for Oh. The terms of trade for 1 ton of glass must be between 5 and 3 oranges. In our example, 1 ton of glass trades for 4 oranges, thus the terms of trade for a ton of glass is between 5 and 3 oranges, and trade occurs.

What if the terms of trade were not between the two opportunity costs? In that case both countries would want to produce the same good, and trade would not occur. Suppose that 6 oranges trade for 1 ton of glass. Now what? What will Cal produce? Cal will want to produce glass and trade for oranges since it

can get 6 oranges by trading while it could only get 5 if it did not trade. Oh, on the other hand, will also want to produce glass since it can get 6 oranges by trading but only 3 if it does not trade. So everyone will want to produce glass and no one will be producing oranges. How can trade occur if everyone wants to produce glass? There will be no oranges to trade. Thus the potential for trade depends on the terms of trade as well as the opportunity costs.

### ***Production Possibilities***

Comparative advantage can be illustrated graphically. Each country has certain possibilities for production. These possibilities can be represented by the production possibilities curve introduced in Chapter 3. First we will obtain the individual production possibilities for each country, Cal and Oh, producing without trade.

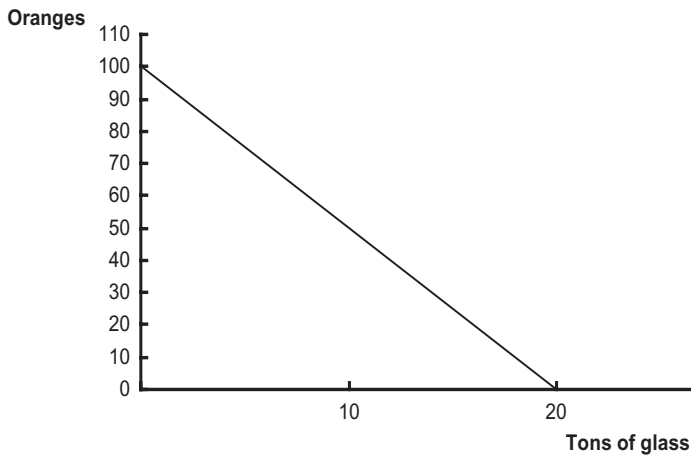
To obtain the production possibilities, we start where all resources are used to produce oranges, decrease orange production, and find the amount of glass that can be produced for each amount of oranges given up. Suppose that we know that if Cal uses all its resources to produce oranges, it can produce 100 oranges. Further, suppose that Cal has to give up 10 oranges to get 2 tons of glass. Suppose that we decrease orange production by 10 to 90. How many tons of glass can Cal produce? According to the opportunity cost, Cal can produce 2 tons of glass. Two tons of glass and 90 oranges becomes a point on Cal's production possibilities. If we further reduce orange production by 10 more to 80, glass production will increase by 2 more tons to 4 tons. As we continue reducing orange production by 10 at a time, glass production will rise by 2 tons for each reduction of 10 oranges. When all resources are shifted over to the production of glass, Cal will be able to produce 20 tons of glass and no oranges. The result is a straight-line production possibilities for the country Cal, as shown in Figure 30-1.

The same process can be used to find the production possibilities for Oh. Assume that Oh can produce 3 oranges or 1 ton of glass and that the largest possible orange production in Oh is 30 oranges. The production possibilities for Oh is shown in Figure 30-2. Note that if all resources are used to produce glass, Oh can produce 10 tons.

We now want to find the production possibilities with trade in a world made up of Cal and Oh. What is the total production that can be obtained when both countries combine their output? The world production possibilities is shown in Figure 30-3. To determine the world production possibilities, we add

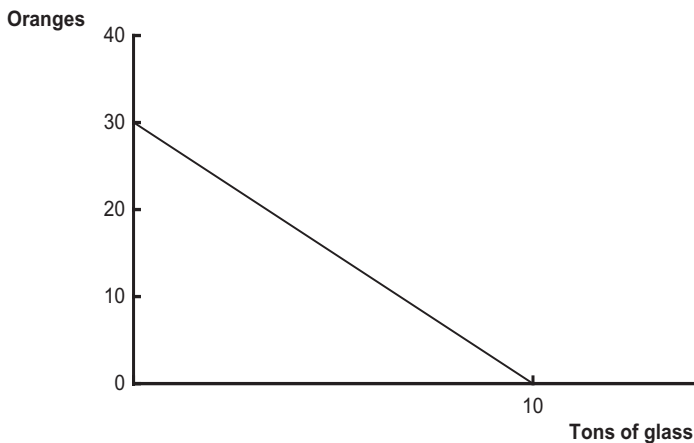
the production possibilities of the two countries together. How are production possibilities curves added?

Suppose that we start with the production possibilities for each country and find the total orange production. If all resources are used to produce oranges, 100 oranges are produced by Cal and 30 by Oh. The total production will be 130 oranges. But what is the opportunity cost? We are about to take resources



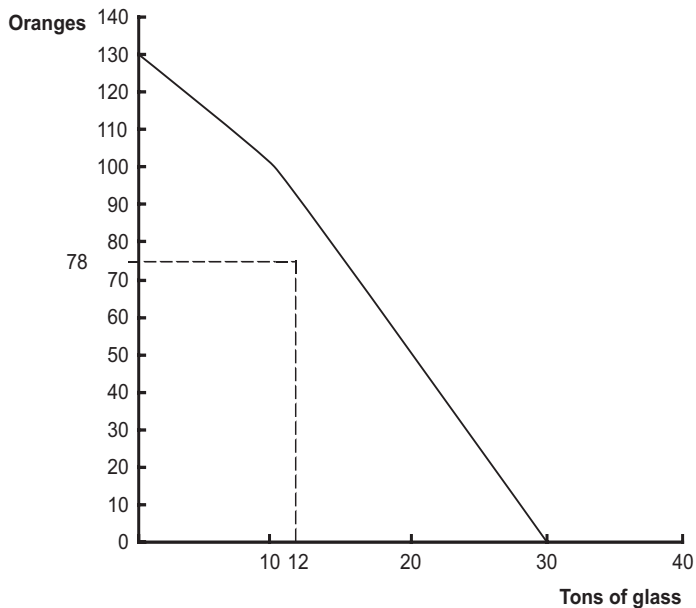
**Figure 30-1 Production possibilities for Cal**

This graph shows the production possibilities for Cal in oranges and glass.



**Figure 30-2 Production Possibilities for Oh**

This graph shows the production possibilities for Oh in oranges and glass.



**Figure 30-3 World Production Possibilities with Trade**

The world production possibilities shows that both countries can have more with specialization and trade than without.

out of the production of oranges and put them into the production of glass. We want to get the most glass possible for our oranges. Thus we will take resources out of orange production where we can get the most glass. So we should take resources out of orange production in Oh because we can get 1 ton of glass by spending only 3 oranges while in Cal we would have to spend 5 oranges to get one ton of glass. We will continue taking resources out of orange production in Oh until there are no more resources producing oranges in Oh. At that point we will have a world production of 100 oranges and 10 tons of glass.

The rule we use to obtain the world production possibilities is to reduce the production of a good in the country that could provide the largest amount of the other good and to continue the reduction until the country produces no more of that good. Then our only choice will be to take resources out of production of the good in the other country, in this case orange production in Cal. Now to get each added ton of glass, we will have to reduce orange production by 5. This process will continue until we have no resources producing oranges in either country, and only glass is produced. Now we will have 30 tons of

glass. This is reasonable, since if all resources are used to produce glass in Oh, 10 tons can be produced; while if all resources are used to produce glass in Cal, 20 tons can be produced. A total of 30 tons of glass can be produced by both countries combined.

Now that we have the world production possibilities, what does it show? Suppose that no trade occurs. Then the best that each country can do is choose some combination of oranges and glass on its individual production possibilities. Suppose that Cal chooses 60 oranges and 8 tons of glass and that Oh chooses 18 oranges and 4 tons of glass. Without trade, neither can have more of both goods. And with trade? With trade, the world production possibilities becomes feasible. Note that the choice made by each country individually gives a total of 78 oranges and 12 tons of glass. This choice without trade is inside the world production possibilities. Thus trade allows both countries to consume more than if no trade occurs.

### ► Summary

The possibilities for trade have been the topic of this chapter. You learned that if for some good each country has an absolute advantage — the ability to produce a good more cheaply than another — then trade makes sense. But the surprising lesson is that even if one country can produce both goods more cheaply than another, there still may be gains from trade. In this case, comparative advantage — the ability to produce relatively more cheaply in terms of opportunity cost — will determine if trade should occur. It is not the absolute advantage but the comparative advantage that is important.

By specializing and trading, two countries can have more of each good than without trade. Specialization and trade allow the amount of consumption in the world to increase. The case for specialization and trade is impressive. But could there ever be situations where this case could be dismissed? Would we ever wish to forgo the gains from trade? In the next chapter we will consider the case where money is required for trade. We will also consider whether there are times when barriers to trade may be desirable.

### ► Key Concepts

- absolute advantage
- comparative advantage

## ► Discussion Questions

1. Cousin Sue grows asparagus. She hates asparagus. Why would she grow it?
2. Attorney Blankstare is a successful lawyer. He also types flawlessly at 100 words per minute. Should attorney Blankstare hire a typist who can only type 80 words per minute or continue doing both the legal work and the typing? Explain what economic principle is involved.
3. Uncle Effron does not believe in comparative advantage. He says that when you can produce with fewer resources, there is no need to trade. Is he right? Explain comparative advantage to Uncle Effron.
4. Comparative advantage does not depend on the terms of trade, yet the terms of trade may determine that trade does not occur even when there is a comparative advantage. Explain.
5. How does the world production possibilities in Figure 30-3 show that gains from trade are possible?

## ► Self-Review

- Fill in the blanks

The ability to produce a larger quantity of a good with the same amount of resources is called the \_\_\_\_\_.

absolute advantage \_\_\_\_\_ When one producer has an absolute advantage in good A and the other producer has an absolute advantage in good B, you would expect each to specialize in the \_\_\_\_\_ advantage and \_\_\_\_\_. But what if one producer has the absolute advantage in both goods? Trade is \_\_\_\_\_ possible. When the opportunity cost of a good is less than the opportunity cost for the same good by the other party, the first party has a \_\_\_\_\_ in the production of the good. The key to specialization and trade is \_\_\_\_\_ advantage. When a producer has a comparative advantage in the production of one good, the other producer has a \_\_\_\_\_ advantage in the production of the \_\_\_\_\_ good. What is important is which producer can make the good \_\_\_\_\_ more cheaply in terms of the \_\_\_\_\_ cost. The combined production possibilities curve for two countries shows the possibility of \_\_\_\_\_ from trade.

absolute advantage

absolute trade still

comparative advantage

comparative

comparative other relatively opportunity

gains

- Multiple choice

1. Suppose that country A can produce 3 tons of sweet potatoes or 6 tons of turnips with a given amount of resources. Country B can produce 2 tons of sweet potatoes or 4 tons of turnips with the same resources.
  - a. Country A has an absolute advantage in sweet potatoes.
  - b. Country B has an absolute advantage in turnips.
  - c. Country A has an absolute advantage in both goods.
  - d. Country B has an absolute advantage in both goods.
2. Comparative advantage means:
  - a. one country has a lower opportunity cost for a good than another country.
  - b. what one country has to give up to get a unit of the good is less than what another country has to give up.
  - c. both a and b.
  - d. none of the above.
3. Cindy and Sue are best friends and decide to work together over the summer to earn money. Cindy can wash four dogs or weed one garden in an hour. Sue can wash six dogs or weed two gardens in an hour. Who has the comparative advantage in which good?
  - a. Cindy has a comparative advantage in weeding.
  - b. Sue has a comparative advantage in both.
  - c. Sue has a comparative advantage in washing dogs.
  - d. Cindy has a comparative advantage in washing dogs.
4. The opportunity cost of a tomato is 3 beans for country A and 4 beans for country B. Which country has the comparative advantage in tomatoes?
  - a. Country A.
  - b. Country B.
  - c. Neither has a comparative advantage.
  - d. Not enough information to tell.
5. If country X can produce a good using less resources than country Y, then country X has:
  - a. a comparative advantage in the good.
  - b. an absolute advantage in the good.
  - c. both a comparative advantage and an absolute advantage in the good.
  - d. no advantage in either good.

Answers: 1.c, 2.c, 3.d, 4.a, 5.b.