

reflecting higher volume and higher price. The average price for a barrel of crude oil rose to \$19.52 in September, the highest level since crude oil was selling for \$20.48 per barrel in February 1997.

Problems for Section C

- C1.** Find the revised import expenditure given increased excess demand for manufactures in Figure 1.8. Suppose the international price rises to \$6.25 and quantity traded rises to 300. Find the BOT using the export revenue in Figure 1.11.
- C2.** Predict what will happen to the BOT if excess supply of agricultural goods in Figure 1.11 increases with improved technology in the exporting home country.

D. COMPARATIVE ADVANTAGE AND SPECIALIZATION

If there is a single slogan that international economists live by, it is *specialize and trade*. International economics is constantly sharpened on the arguments put forth by domestic industries seeking protection from foreign competitors through government tariffs, quotas, and other nontariff barriers. Protection isolates parts of the economy from international competition. Free trade leads to increased international specialization with relatively inefficient domestic firms failing in the face of more efficient foreign competition. This section introduces the principles of opportunity cost and comparative advantage. The gains from specialization and trade arise because of comparative advantage.

Opportunity Cost and Comparative Advantage

When you sit down to read this text, you are giving up some alternative activity. The value of your best alternative is the opportunity cost of reading international economics. Opportunity cost is the best alternative an economic agent has when a choice is made.

Consider the example of you and your roommate and the two tasks of vacuuming and making beds. Your roommate might be better at both, taking less time than you to finish either task in the same manner. Suppose you are relatively quicker at vacuuming. The *opportunity cost* of your vacuuming is lower than for your roommate. If you vacuum while your roommate makes beds, you both will gain. The two of you could specialize and trade, each spending less time on these routine tasks.

As another example, suppose you and a friend open a sideline business of delivering local packages in the afternoon. Both of you wait by the phone for an order. When a call comes in, one of you jumps on your bike, ride to pick up

the package, delivers it, and returns to wait for another call. If one of you instead waits by the phone, takes orders, and routes the other from place to place by cell phone, your firm's output increase. Specialization increases efficiency. Of the two of you, the biker with the lower opportunity cost of organizing orders should be on the road. You might be the better biker and the better organizer, but only comparative advantage matters.

EXAMPLE 1.12 *Merchandise Trade in the 1990s*

Merchandise trade grew in value during the 1990s although growth in Japan and the Asian NICs declined during the Asian crisis in the late 1990s. The country groupings below account for about 2/3 of world merchandise trade. The Asian NICs are Taiwan, Hong Kong, Malaysia, Korea, Singapore, and Thailand. World trade grew at an average of 6% annually during the 1990s. Trade in business services accounts for about 20% of total world trade. NAFTA has had the highest growth in trade, followed closely by the EU. The Asian NICs have had very high growth rates for most of the 1990s, but declines during the late 1990s. Data are from the WTO.

	Exports		Imports	
	% world	% growth	% world	% growth
NAFTA	17%	7%	21%	8%
EU	42%	6%	40%	6%
Japan	7%	2%	5%	0%
Asian NICs	10%	9%	8%	3%

Absolute Advantage versus Comparative Advantage

In these examples, an *absolute advantage* in producing a good means a lower unit labor input. In the example of vacuuming and making beds, your roommate takes less time to finish either task and has an absolute advantage in each activity. In the example of a local delivery service, you might be a better biker and telephone organizer with an absolute advantage in both activities.

An absolute advantage in a good means fewer resources such as labor and energy is used to produce a unit of the good. Suppose the US has an absolute advantage relative to other nations in producing both manufactured goods (cars, appliances, clothing) and services (banking, telecommunications, education, entertainment). Perhaps the US has more capital machinery and equipment or more highly trained labor than other countries. Does this mean the US should be totally self-sufficient, consuming only the goods it produces and not trading at all?

Mexico might have lower opportunity costs or a comparative advantage in producing manufactured goods. *Comparative advantage* is based on a lower

opportunity cost that one economic agent has compared with another in a particular activity. When comparing labor inputs across goods, Mexico uses *relatively* less labor in manufacturing than does the US. The opportunity cost of lost service output when the US produces manufactures is higher. Mexico gives up more manufactures when it produces services. Both nations can end up consuming more of both goods if each specializes in producing the type of good in which it has a comparative advantage, and then trades with the other. The US will specialize in services and export them to Mexico in exchange for manufactured goods.

No trickery is at work. Each country is simply spending its time and resources on the activity in which it has lower opportunity cost. Total output for the world will increase when each country specializes. Countries may have absolute advantages in most goods, some goods, or no goods at all. Still, each country should specialize according to its comparative advantage.

International economists study the process of organizing production globally. Nations can potentially consume more of all goods when they specialize and trade because the world's ability to produce is increased.

Looking for comparative advantage means looking for activities with low opportunity costs. This relative efficiency advantage explains why specialization and trade are beneficial.

EXAMPLE 1.13 *Regional Trade vs Global Trade*

Most of the trade in the world occurs between countries located close together in various regions of the world. The US trades heavily with its neighbors in NAFTA, and trade with the Americas and the Pacific Rim is growing. About 2% of world trade occurs between the Americas and Japan, and 3% between the Americas and the oil exporters. Another 3% occurs between Europe and Africa. The rest of world trade takes place mostly between countries within regions, countries relatively close together. Transport costs are lower for countries closer together, and cultural ties make trade easier. Also, regional free trade agreements lower tariffs and other forms of protection.

Labor Inputs and Comparative Advantage

Suppose the hours of labor it takes to produce a unit of manufactured goods (M) or services (S) in the US and Mexico are:

	US	MEX
S	2	3
M	3	4

The US has an absolute advantage in producing both products since less time is required to produce a unit of either.

Nevertheless, the relative price of services will be lower in the US. In the time it takes to produce 1 unit of S , only $2/3$ of an M could be produced. It requires 3 hours to produce an M in the US, and $2/3$ of an M would be produced in 2 hours. In Mexico, M could be produced in the time it takes to produce 1 unit of S . The opportunity cost of producing S is higher in Mexico than in the US. Mexico gives up more M when its resources produce a unit of S . The US has the comparative advantage in services.

In the time it takes to produce one M , $3/2$ units of S could be produced in the US but only $4/3$ units of S could be produced in Mexico. The opportunity cost of producing M is higher in the US than in Mexico because the US gives up more S when it produces a unit of M . Mexico has the comparative advantage in producing manufactures.

Comparative advantage is found by comparing opportunity costs or relative prices across nations.

Nations specialize according to comparative advantage. Competitive forces lead nations toward specialization according to comparative advantage. Global resources are used more efficiently, and total world output increases with specialization according to comparative advantage. This idea is one of the oldest in economics and remains one of the most important. With specialization and trade, the value of consumption increases in every country.

Comparative advantage abstracts from details of market supply and demand for the goods involved. It is a simpler way of explaining the pattern of trade. Prices of goods in the domestic and foreign markets and the exchange rate take on secondary importance when it is understood that comparative advantage offers a more fundamental explanation of trade.

The original example of comparative advantage created by David Ricardo more than 200 years ago involves the labor to produce wine (W) and cloth (C) by Portugal and England,

	PORT	ENG
W	80	120
C	90	100

Portugal has the absolute advantage in both goods. In the time it takes to produce one W , $80/90$ of a C can be produced in Portugal and $120/100 = 6/5$ units of C can be produced in England. The opportunity cost of wine is lower in Portugal. Portugal gives up less C to produce a W . Portugal has the comparative advantage in wine and England has the comparative advantage in cloth.

EXAMPLE 1.14 *The China Trade*

China is entering the WTO and is opening to international trade and finance after decades of suffering as a closed planned economy. By most measures China is an LDC. With incoming foreign investment, income and wages in China will rise. Production and export of assembly line manufactures will increase. Main categories of Chinese exports and imports in 1990 and 1997 from the UN are below listed in \$billion. Exports of labor intensive apparel and textiles have increased during the 1990s. Imports of textiles are yarns used to make cloth, and cloth is imported for apparel manufacturing. Imports of machinery are used in production. In 1997 China had a trade surplus in food products and a trade deficit in crude materials, each \$7 billion. With the entry of China, the Pacific Rim will become a major world production area along with the EU and North America.

Chinese exports		Chinese imports	
clothing	\$32 billion	chemicals	\$19 billion
textiles	\$14	elec machinery	\$14
elec machinery	\$13	textiles	\$12
telecom equip	\$10	machinery	\$10
chemicals	\$10	oil	\$10

The Power of Comparative Advantage

Comparative advantage can predict trends in the pattern of trade between countries. The economic agents (producers, exporters, importers, and consumers) do not have to worry about comparative advantage. Firms are looking for profit opportunities and consumers are seeking better goods and services at lower prices. International trade arises because these agents act in their own self interest. You do not need to know the principle of comparative advantage to run a successful international business but the principle underlies international business activity. It offers a simple and unifying principle for understanding economic decisions.

Comparative advantage is perhaps the one true principle in the social sciences. No matter how inefficient a country might be in an absolute sense, it must have a comparative advantage in some activities. Comparative advantage works to compare nations, regions, states, cities, neighborhoods, or individual firms. Specialization between people can also be understood with comparative advantage. Lawyers do not do their own typing, no matter how good their typing is, because their comparative advantage lies in interpreting law.

EXAMPLE 1.15 *Trade in Thirds*

NAFTA, the EU, and Japan account for 48% of world output and 61% of world exports. These 1997 shares of world merchandise trade from the World Bank reflect the high productivity of these economies. Growth has been highest in NAFTA as indicated by these growth rates in merchandise trade from 1990 to 1997. Japan has not entered into any trading blocs, and is more protected than NAFTA and the EU.

	% exp	% imp	exp growth	imp growth
NAFTA	24%	29%	8%	8%
EU	20%	18%	6%	5%
Japan	10%	8%	3%	6%

EXAMPLE 1.16 *Infrastructure & Trade*

Infrastructure facilitates commerce and trade. Infrastructure includes roads, bridges, utilities, telecommunication, airports, ports, water, sewer, and so on. Better infrastructure lowers costs of transport and business services, making a country more competitive on international markets. Spiros Bougheas, Panicos Demetriades, and Edgar Morgenroth (1999) uncover evidence that better infrastructure lowers transport costs and increases the level of trade among European countries.

Problems for Section D

D1. You are a whiz and can clean the bathroom in 15 minutes and the kitchen in 30, while your roommate takes 20 and 45 minutes for the two tasks. Find who has the absolute and comparative advantages in each activity.

D2. Determine the absolute and comparative advantage in this hypothetical situation of labor inputs between the US and Canada:

	US	CAN
<i>S</i>	2	3
<i>M</i>	3	2

Does one country have the absolute advantage in both goods? Find the opportunity costs and relative prices of *S* in each country. Which country will specialize in which good?

EXAMPLE 1.17 “The Battle in Seattle”

The WTO held a meeting in Seattle in December 1999 leading to another round of trade and investment negotiations. The WTO has 135 members with headquarters in Geneva. *Time* magazine ran a story (29 November 1999) prior to the WTO meeting. Major issues to be addressed were agricultural protection and subsidies in the EU and Japan, labor issues in the LDCs, global environmental agreements to avoid pollution havens, protection of business services from US multinational firms, and dumping in the US. There were protests in Seattle from anti-globalists, protectionist reactionaries, US steelworkers, French farmers, clergy demonstrating for third world debt relief, radical political groups, Industrial Workers of the World, forest activists, and environmentalists. The reason for all of the attention is that the WTO has become the most powerful and influential international organization. WTO has usurped the power of governments to tax and regulate international trade, leading all countries toward free trade. The Seattle meeting collapsed but talks and negotiations continue. There is simply too much at stake. Without the WTO, narrow nationalistic protectionism would be the rule and incomes would fall.

EXAMPLE 1.18 *How Open is an Economy?*

Countries vary in their involvement in international trade. The ratio of export revenue plus import expenditure to output $(X + M)/GDP$ is a gauge of openness. In 1992 Singapore was the most open economy and Brazil was the least open according to data from the IMF. Singapore and Hong Kong are commercial centers with free trade and investment. The top 5 and bottom 5 countries are listed below, along with major trading partners of the US. The US has almost doubled over the past 30 years in its ranking, but remains a relatively closed economy.

	openness		openness
Singapore	341	China	34
Hong Kong	286	Mexico	31
Luxembourg	181	Peru	22
Lesotho	156	US	22
Malaysia	156	India	21
Germany	60	Japan	18
Canada	54	Brazil	17
UK	49		

CONCLUSION

The overall picture of international trade that begins to develop is one of many international markets constantly adjusting to grind out relative prices of traded goods. The fundamentals of every market are the same. With some application you can recognize and predict adjustment patterns. You are a consumer and will be involved in the production of goods and services. Your firm and industry will be exporting or facing import competition. It is important to become familiar with the fundamentals that determine adjustments in international prices and trade.

EXAMPLE 1.19 *Comparing DCs and LDCs*

The US and the EU account for 41% of world output and 54% of world exports. Asia is another major producing area but less oriented toward exports and with a much larger population. LDCs have 78% of the world's population but produce only 40% of world output and 2% of exports. These percentages of world totals from the World Bank illustrate the vastly different productivity in DCs and LDCs. The last column shows *GDP/capita* relative to the US.

	% GDP	% exp	% pop	% US GDP/capita
DCs	55%	78%	16%	81%
US	21%	14%	5%	—
Japan	7%	7%	2%	83%
EU	20%	40%	6%	79%
LDCs	40%	18%	78%	12%
Africa	3%	2%	12%	7%
Asia	23%	8%	52%	10%

EXAMPLE 1.20 *How to Export*

The Department of Commerce has a Trade Promotion Association with data on which countries are looking for which products. The Small Business Administration has an Office of International Trade (OIT) with training conferences and counseling. The SBA has a group of retired business people SCORE (Service Corps of Retired Executives). The internet provides immediate export potential. Importers generally have to wrestle with customs and red tape. The exporter may have to provide transportation, but international shipping and delivery is becoming more efficient and available.

Key Terms

Absolute and comparative advantage	Export revenue
Arbitrage	Import expenditure
Autarky price	International equilibrium price
BOT surplus and deficit	Mercantilism
Currency depreciation	Normal and inferior goods
Diminishing marginal productivity	Opportunity cost
Excess demand	Relative cost
Excess supply	Specialization
Exchange rates	Substitution and income effects
Expectations	Transport costs

KEY POINTS

- An international market clears at the price where excess demand in the importer equals excess supply from the exporter.
 - Excess demand is the difference between the quantity demanded and quantity supplied across prices. Excess supply is the difference between quantities supplied and demanded.
 - Changes in the demand or supply for a traded good affect its international excess demand or supply, international price, and level of trade.
 - The balance of trade is export revenue minus import expenditure. A trade deficit (surplus) occurs if import expenditure is greater (less) than export revenue.
 - A country has a comparative advantage in producing a good if its opportunity cost of the good is lower than in other nations.
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REVIEW PROBLEMS

1. Diagram what will happen to the price and quantity of oil traded when OPEC restricts supply, using a diagram based on Figure 1.4.
2. By tradition, Japanese businesses deal only with Japanese banks. Japan is a net importer of banking services. As Japanese businesses begin dealing more with US banks, show what will happen in the market for banking services between the two countries.
3. Illustrate what will happen in the international market for cars as income rises in China. Treat China as the home nation, and Japan as the foreign excess supplier.
4. Diagram what will happen in the market for wheat between the US and Russia when a forecast says Russia will have a long winter and a spring drought. Russia is the importer of wheat.
5. Illustrate what will happen in the international market if the Buy American campaign aimed at US consumers decreases domestic tastes for apparel imported.
6. The US is an exporter of business services and is trying to get other nations to lower their protection. Show what will happen in the international market for business services if

- foreign nations increase their demand for US business services. Will domestic consumers of services enjoy the change?
7. Diagram what will happen in the international market for cars if the US announces a lower tariff on imports that will take effect in one year. (Hint: This announcement affects both the excess demand in the US and the excess supply from Japan.)
 8. Show what will happen in the international market for cars if technology for auto production improves in the US, a net importer.
 9. Illustrate what will happen in the international market for gold if news of war causes buyers and sellers to expect high gold prices in the future.
 10. Suppose US and Venezuelan demands for steel are approximately the same. The domestic and foreign autarky prices are \$500 and 22,500 bolivars respectively, and the exchange rate is bol/\$ = 45. Determine the likely exporter. Illustrate international excess supply and demand when the international price is \$475, the volume of trade 100, US production 100, and Venezuelan production 300. Find consumption in each nation.
 11. In Problem 10, find US import expenditure on steel. How many bushels of wheat would the US have to export at \$2.50/bu to balance trade? At \$2/bu?
 12. Explain whether you think a BOT surplus or deficit should be preferred for the US for the next 10 years. Would any governmental policy help attain this goal?
 13. Consider the following pattern of labor inputs between the US and the EU. Who has the absolute and comparative advantage in each good? Predict the pattern of trade.

	US	EU
<i>S</i>	2	3
<i>M</i>	3	4.5

14. Justify your opinion about the goods in this list in which the US has a comparative advantage: oil, insurance, new cars, thread, accounting, textiles, engineering, clothing, olive oil, economic forecasting, chemicals, wheat, telecommunications, warm winter vacations, cool summer vacations, citrus fruits, fast food, architectural design, education, internet service.

READINGS

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