Chapter

1 An Introduction to International Trade

Topics to Be Covered

Characteristics of National Economies
The Direction of International Trade
What Goods Do Countries Trade?

Key Words

Gross national product (GNP)
Gross domestic product (GDP)
Exports
Imports
Index of openness
Trade deficits
Trade surpluses

International economists study fascinating questions. What impact will the global financial crisis have on world trade? Has the recent growth of world trade exacerbated the impact of the crisis? Does growing reliance on international trade lead to a loss of "good" jobs for Americans? Can U.S. firms compete against firms in low-wage countries? What influence does the World Trade Organization (WTO) have over U.S. policy? Why does the United States have such a large trade deficit, and is this deficit harmful to the economy? What is the appropriate value of the dollar? In other words, international economists are concerned with a variety of real-world topics that appear in the news almost every day.

This book provides a comprehensive introduction to international economics. We discuss all of the issues just mentioned. We show you how economists go about investigating these issues. We provide you with a large amount of information on the extent and nature of international commercial transactions. Along the way we attempt to relate the many issues and concepts we encounter to real-world events. Finally, and most important, we attempt to provide you with a simple analytical tool kit that will allow you to study issues such as those mentioned in the preceding paragraph and to weigh future events as they occur.

Recall that when you took Principles of Economics, the course material was divided into two main parts: microeconomics and macroeconomics. In international economics in general, and in this

book in particular, there is a similar division of material. The first ten chapters of this book deal with the theory of international trade (international microeconomics). Of central importance in these chapters is the international exchange of goods and services. Questions of particular interest include the following: Why do nations engage in international trade? What goods do nations trade? How does international trade affect the amount and distribution of jobs and the level of earnings in the economy? Should international trade be regulated by tariffs, quotas, or other barriers, and, if so, to what extent should the regulation occur? And how are countries affected by international flows of labor and capital? In addition to these questions, this part of the book discusses how trade policies are formulated in the United States and elsewhere and describes the various currently existing forms of trading arrangements between countries.

Chapters 11 through 18 are concerned with international finance (or international macroeconomics). The subject matter in these chapters tends to focus on the international exchange of financial assets. Issues that are studied include the balance of payments; the determination of exchange rates; the relationships among exchange rates, prices, and interest rates; international banking, debt, and risk; and the interaction of macroeconomic policies between various nations. Also discussed in these chapters are the evolution of the world's international monetary system and the role of international organizations, such as the International Monetary Fund, in today's international economy.

The purpose of economics is to develop an understanding of the patterns of commercial transactions as well as many of the personal and social interactions that we observe in the real world. International economics focuses its analysis on the commercial interactions between the countries of the world. The goal of international economics is to fashion a theoretical framework that is sufficiently general to allow one to offer explanations of phenomena and to make predictions about the likely outcome of changes in the international environment. Thus, much of the discussion in this book is devoted to developing theories about economic behavior. But theorizing should not be done in a vacuum. It is important to know the facts before we begin. How important is international trade to the nations of the world? Which countries trade with which other countries? What goods do countries trade? The remainder of this chapter is devoted to presenting the factual answers to questions such as these.

CHARACTERISTICS OF NATIONAL ECONOMIES

There are more than 190 countries in the world today. They come in all shapes and sizes. There are large countries with large populations (China, India) and large countries with small populations (Australia, Canada). There are small countries with large populations (Japan) and small countries with small populations (Jamaica, Singapore). No matter what their size, however, there are certain characteristics that are common to all. In each, for instance, there is economic activity. Goods and services are produced, exchanged, and consumed.

Gross national product (GNP)
The value of final goods and services produced by domestic factors of production.

Gross domestic product (GDP)
The value of final goods and services produced within a country.

The extent of economic activity in a country can be measured in many ways. The two most common measures are the **gross national product (GNP)** and the **gross domestic product (GDP)** of a country.* Both GNP and GDP provide estimates of the total value of sales of final goods and services for a given country. And, because sales of goods and services constitute income to those selling these products, GNP and GDP can also be thought of as indicators of total national income. The difference between GNP and GDP has to do with who is producing the goods, and where. GDP refers to production within a country, no matter whether the factors of production (e.g., labor and capital) are domestic or foreign. GNP refers to production by domestic factors, no matter where they are located. Thus, goods produced by Canadians working in factories in the United States would count as part of U.S. GDP but would also be part of Canadian GNP. For most countries there are only very small differences between GNP and GDP.

* World Bank publications now refer to GNP as gross national income (GNI).

That there is any difference at all is because some factors of production (e.g., labor, capital) are internationally mobile. In Chapter 10 we discuss some of the economic implications of international factor mobility.

A crude measure of the standard of living in a country is obtained by the ratio of that country's GNP (or GDP) to its population. This measure is known as the country's *income per capita*, or *per capita GNP (or GDP)*. In essence, it tells us how much each resident of a country would have if the value of that country's production was equally divided among all members of society. By this standard, some countries are low or middle income (even though some residents may be rich) while other countries are high income (even though some residents may be poor). In this book countries classified as low or middle income are referred to as *developing or emerging market countries*. Richer countries are identified as *developed* or *industrialized*.

All countries participate in international trade. That is, some goods and services produced within every country are sold to economic agents (e.g., individuals, firms, governments) in other countries; these products are known as **exports**. Some goods and services consumed within a country have been purchased from economic agents in other countries; these goods are known as **imports**.

Exports
Goods sold by economic agents located in one country to economic agents located in another.

Imports
Goods purchased by economic agents located in one country from economic agents located in another.

Countries differ in how much they participate in international trade. A measure of this participation (again, a very crude measure) is given by the ratio of exports to GDP (or GNP) multiplied by 100. This measure is known as the **index of openness**. In general, this number will vary between 0 and 100, although values greater than 100 are possible.* Countries with high values of this index trade a lot with the rest of the world and are said to be relatively *open*. Countries with low values of the index are said to be relatively *closed*, because international trade is only a small part of their economic activity.

Index of openness
A measure of the importance of international trade to an economy, calculated as the ratio of exports over total domestic production.

To understand better the concepts we have presented so far, let's consider some numbers from the real world. Table 1.1 shows the data for a large set of countries. Information is presented on country size in terms of population and area. Also shown are data on GNP per capita (measured in two ways), indexes of openness (exports of goods and services as a percentage of GDP) for 1980 and 2009, and merchandise trade figures (imports and exports for 2009).

Let's explore some of the facts contained in the table. First, note that for each country category, the data are arranged by ascending order of GNP per capita. The poorest countries of the world tend to be located in Africa and Asia. The richest countries tend to be the industrialized countries of Western Europe, North America, and the Pacific Rim. Except for China and India, physical size (land area) and population size appear to have little role in explaining income per capita.

According to the numbers in column 3 of the table, most of the low- and middle-income countries are desperately poor. GNP per capita in some of these countries is less than $500, compared with an average GNP per capita in excess of $34,000 in the high-income countries. In India, for instance, per capita GNP was calculated to be $1,180 in 2009. You may wonder how anyone could survive for one year with such a low income level. Part of the answer to this question lies in the fact that differences in productivity levels and government policies mean that individuals in these countries pay much lower prices for many of the goods and services they consume than people pay in the United States or other developed countries. For example, middle-income citizens of India currently pay about $100 per month to rent an apartment in most cities, and the average man pays between 50¢ and $1.00 for a haircut. Both of these prices are significantly lower than the prevailing prices in the United States. Because standard measures of GNP are based on valuing goods in terms of prevailing market prices, there will be a tendency for GNP measures to be biased downward in countries where prices measured in dollar terms are so low.

* A value greater than 100 means that the country's exports are bigger than its overall level of production (GDP or GNP). Such a situation could occur if much of the economic activity of the country in question involved the assembly and export of final products made from imported raw or partially assembled materials. The value in excess of 100 comes about from the fact that output is (always) measured in terms of value added—the value of capital and labor services devoted in this case to the assembly of goods—while exports are measured in terms of the total value of goods—including the value of the imported parts. Clearly, in such circumstances it is quite likely for exports to be greater than value added.

TABLE 1.1 Basic Characteristics of Selected Countries

	2009 Population (millions)	GNP per capita: Area (1,000s sq. km.)	GNP per capita: 2009 ($)	GNP per capita: PPP Estimate	GNP per capita: Avg. Yearly % Growth 2000–2009	Index of Openness: 1980	Index of Openness: 2009	Goods & Services: Exports 2009 (millions of $)	Goods & Services: Imports 2009 (millions of $)
Low-income Economies									
Burundi	8.0	28	150	390	0.2	9.0	4.9	65	410
Malawi	15.0	118	280	760	2.1	25.0	19.3	960	1,600
Ethiopia	83.0	1,104	330	930	5.9	11.0	5.2	1,490	7,310
Niger	15.0	1,267	340	660	0.8	25.0	16.7	900	1,550
Sierra Leone	6.0	72	340	790	6.2	18.0	10.6	205	505
Guinea	10.6	246	370	940	0.5	n.a.	23.9	980	1,400
Madagascar	20.0	587	420	1,050	1.1	13.0	12.7	1,150	2,900
Mozambique	23.0	802	440	880	5.4	11.0	19.9	1,950	3,750
Nepal	29.0	147	440	1,180	1.7	12.0	5.4	680	3,550
Togo	7.0	57	440	850	−0.1	51.0	27.3	780	1,400
Central African Republic	4.0	623	450	750	−1	25.0	5.5	110	300
Rwanda	10.0	26	460	1,060	4.3	14.0	4.0	205	1,750
Uganda	33.0	241	460	1,190	4.3	19.0	22.6	3,560	4,410
Tanzania	44.0	945	500	1,350	4	n.a.	13.7	2,970	6,347
Burkina Faso	16.7	274	510	1,170	2.1	10.0	9.8	800	1,900
Bangladesh	159.0	144	590	1,580	4.3	4.0	16.9	15,081	21,833
Chad	11.0	1,284	610	1,230	7.2	17.0	40.4	2,700	2,100
Mali	13.0	1,240	680	1,190	2.9	15.0	23.3	2,100	2,600
Ghana	24.8	239	700	1,480	3.4	8.0	35.4	5,530	8,140
Benin	9.0	113	750	1,510	0.7	23.0	15.0	1,000	1,800
Kenya	40.0	580	770	1,570	1.8	28.0	14.4	4,335	9,670
Mauritania	3.0	1,026	960	1,960	2.1	37.0	44.9	1,360	1,410
Group Average			**500**	**1,112**	**2.7**	**18.8**	**17.8**	**2,223**	**3,938**
Middle-income Economies									
Pakistan	170.0	796	1,020	2,710	3	12.0	10.6	17,695	31,720
Senegal	13.0	197	1,030	1,790	1.6	27.0	16.7	2,180	5,210
Côte d'Ivoire	21.0	322	1,060	1,640	−1.4	35.0	40.4	9,300	6,500
Nigeria	155.0	924	1,140	1,980	4	29.0	31.1	52,500	3,900
Cameroon	20.0	475	1,170	2,200	1.1	28.0	14.2	3,100	3,800
India	1,155.0	3,288	1,180	3,260	6.4	6.0	11.8	155,249	243,636
Papua New Guinea	7.0	463	1,180	2,270	0.9	43.0	57.4	4,530	3,480
Bolivia	10.0	1,099	1,620	4,260	2.2	25.0	28.0	4,850	4,410
Philippines	92.0	300	1,790	3,540	3	24.0	23.9	38,335	45,802
Honduras	7.0	112	1,820	3,730	2.9	36.0	35.8	5,235	7,830
Congo, Rep.	4.0	342	1,830	2,940	1.7	60.0	65.6	5,700	2,700
Sri Lanka	20.0	66	1,990	4,720	4.6	32.0	17.5	7,360	9,883
Egypt	82.0	1,001	2,070	5,690	3	31.0	11.2	21,150	44,946
Indonesia	230.0	1,905	2,230	4,060	4	34.0	22.2	119,776	91,720
Paraguay	6.0	407	2,270	4,430	1.5	15.0	21.3	3,191	6,940
Guatemala	14.0	109	2,620	4,590	1.3	22.0	20.0	7,360	11,521
Morocco	32.0	447	2,790	4,450	3.8	17.0	15.2	13,848	32,804
El Salvador	6.0	21	3,370	6,360	2.2	34.0	17.1	3,797	7,255
China	1,336.0	9,597	3,590	6,770	10.3	6.0	24.1	1,201,534	1,005,688
Tunisia	10.0	164	3,720	7,820	3.9	40.0	36.5	14,449	19,100
Jordan	6.0	89	3,740	5,840	4.7	40.0	27.9	6,366	14,075
Thailand	68.0	513	3,760	7,640	3.7	24.0	57.8	152,498	133,801
Ecuador	15.0	284	3,920	8,040	3.9	25.0	24.0	13,724	15,093
Peru	29.0	1,285	4,150	8,140	4.7	22.0	21.2	26,885	21,706
Algeria	35.0	2,382	4,420	8,130	2.5	34.0	31.1	43,689	39,103
Dominican Republic	10.0	49	4,510	8,100	4	19.0	11.7	5,460	12,230

		GNP per capita				Index of Openness		Goods & Services	
	2009 Population (millions)	Area (1,000s sq. km.)	2009 ($)	PPP Estimate	Avg. Yearly % Growth 2000–2009	1980	2009	Exports 2009 (millions of $)	Imports 2009
Colombia	45.0	1,139	4,930	8,500	3.2	16.0	14.2	32,853	32,898
Bulgaria	8.0	111	5,770	12,290	6	36.0	34.9	16,435	23,300
South Africa	49.0	1,221	5,770	10,060	2.8	36.0	21.9	62,627	71,950
Costa Rica	5.0	51	6,230	10,940	3.4	26.0	30.0	8,777	11,395
Panama	3.0	76	6,710	12,530	5.2	51.0	3.6	885	7,785
Malaysia	27.0	330	7,230	13,530	3.3	58.0	82.2	157,433	123,832
Argentina	40.0	2,780	7,570	14,120	4.4	5.0	18.1	55,750	38,771
Brazil	203.0	8,547	8,040	10,260	2.4	9.0	9.7	152,995	133,609
Romania	21.0	238	8,330	14,460	6.1	35.0	25.1	40,500	54,075
Turkey	75.0	775	8,730	13,730	3.6	5.0	16.6	102,139	140,869
Mexico	107.0	1,958	8,920	14,110	1.2	11.0	26.3	229,707	241,515
Uruguay	3.0	177	9,360	12,910	4	15.0	14.9	5,386	6,907
Russia	142.0	17,075	9,370	18,390	6.2	n.a.	24.7	303,978	191,868
Chile	17.0	757	9,420	13,430	3	23.0	32.4	53,024	42,378
Venezuela	28.0	912	10,150	12,370	3.2	29.0	17.6	57,595	42,220
Group Average			**4,403**	**7,725**	**3.5**	**26.9**	**26.0**	**78,533**	**72,884**
High-income Economies									
Poland	38.0	323	12,260	18,440	4.5	28.0	31.3	134,452	146,626
Hungary	10.0	93	12,980	18,570	3.1	39.0	65.1	83,965	77,550
Slovak Republic	5.0	49	16,130	21,600	5.7	n.a.	63.8	55,933	55,186
Czech Republic	10.0	79	17,310	23,610	3.9	n.a.	59.6	113,319	104,982
Korea	49.0	99	19,830	27,310	3.7	34.0	43.7	363,534	323,085
Portugal	11.0	92	20,940	22,870	0.3	25.0	19.0	43,192	69,238
Israel	7.0	21	25,740	27,040	1.6	44.0	24.5	47,670	49,150
Greece	11.0	132	28,630	28,440	3.2	16.0	6.0	19,886	59,398
New Zealand	4.0	271	28,830	26,430	1.7	30.0	19.9	24,936	25,583
Hong Kong	7.0	1	31,420	44,070	4.6	90.0	153.1	329,739	352,688
Spain	46.0	506	31,870	31,630	1.3	16.0	14.9	218,027	290,240
Italy	59.0	301	35,080	31,330	−0.1	22.0	19.2	404,653	410,385
Singapore	5.0	1	37,220	49,850	4.1	215.0	148.1	269,832	245,785
Japan	128.0	378	37,870	33,280	1	14.0	11.5	580,845	550,679
United Kingdom	62.0	245	41,520	37,360	1.4	27.0	16.1	350,728	479,890
Canada	34.0	9,971	42,170	37,590	1.5	28.0	23.6	315,552	330,268
Germany	82.0	357	42,560	36,960	0.9	n.a.	33.5	1,120,927	931,434
France	63.0	552	42,680	33,980	0.8	22.0	17.9	474,972	551,092
Australia	22.0	7,741	43,770	38,210	1.8	19.0	16.7	154,043	165,471
Ireland	4.0	70	44,310	33,280	2.3	48.0	50.5	114,662	61,871
Belgium	11.0	33	45,310	36,520	1.1	57.0	78.9	369,760	351,035
Finland	5.0	338	45,680	34,430	2.2	33.0	26.4	62,586	60,037
Austria	8.0	84	46,850	38,850	1.5	36.0	35.6	137,217	143,527
United States	307.0	9,364	47,240	46,730	1.2	10.0	7.4	1,056,895	1,603,768
Sweden	9.0	321	48,930	38,560	1.8	29.0	32.2	130,742	118,758
Netherlands	17.0	41	49,350	40,510	1.3	51.0	63.0	498,648	445,802
Switzerland	8.0	41	56,370	41,830	1.2	35.0	34.5	172,742	155,595
Denmark	6.0	43	58,930	37,720	0.8	33.0	30.0	93,102	82,893
Norway	5.0	324	86,440	56,050	1.3	43.0	31.6	120,710	68,506
Group Average			**37,870**	**34,243**	**2.1**	**40.2**	**40.6**	**271,147**	**286,570**

Source: World Bank, *World Development Report 2011* (Washington, D.C.: World Bank) various tables.

Over the past several decades, several international agencies have begun publishing new measures of standards of living that take into account international differences in prices paid for goods and services. In essence, what these numbers do is answer the question, How many dollars would it take in the United States to buy what the average citizen of a country can buy in his or her country at prevailing local prices? At the heart of these measures is an exchange rate concept known as purchasing power parity (PPP); 2009 values of per capita GNP based on PPP exchange rates appear in column 4.* Notice that for the poorest countries in the table, the numbers in column 4 tend to be substantially larger than those in column 3. This indicates that international differences in average standards of living, while still quite large, are not as extreme as the column 3 numbers would seem to indicate. For instance, the conventional measure of India's per capita GNP is $1,180 per year. Using the PPP measure, the standard of living of the typical Indian citizen is $3,260.

Economic Growth

The Great Recession began in the United States in late 2007 and ended in 2009, although unemployment has remained at abnormally high levels into 2012. Since 2007 a number of other countries, primarily in Europe, have also seen economic downturns. Despite this, for most of the countries in Table 1.1, the period 2000–2009 represented an era of relatively strong growth in standards of living. The low-income countries in the table averaged an annual increase in per capita GNP of 2.7 percent (see column 5).† Within this group, growth rates varied considerably, with both negative average annual rates (as low as –1 percent in the Central African Republic) and large positive rates (7.2 percent in Chad, 6.2 percent in Sierra Leone, and 5.9 percent in Ethiopia). Indeed, the most highly populated of the low-income countries (Bangladesh, Ethiopia, and Kenya) all experienced positive annual average growth over the decade. During this period, middle-income countries had the strongest growth rates, averaging 3.5 percent, almost twice the average per capita growth rate in the high-income countries.

Among the low-income and middle-income economies, the most severe negative annual growth rates over the period between 2000 and 2009 occurred in Côte d'Ivoire and the Central African Republic, where per capita GNP fell at rates of 1 percent or more per year. None of the high-income countries experienced negative growth rates over this period, although late in the decade many of the high-income countries in the world saw per capita income levels fall for a year or more. Negative growth in per capita income means that, on average, each individual in society has less income than he or she had in the previous year.

A variety of factors can produce sustained periods of declining standards of living. In 2008, the downturn in the world economy was brought on by a financial crisis that originated in the United States and rapidly spread to many other countries of the world as banks and other financial institutions cut back on lending to businesses and households. With the fall in lending, households reduced purchases and businesses found it increasingly difficult to continue normal activities. In the end, this led to a downward spiral in economic activity, a rise in unemployment, and a loss in income. The slump in the United States began to reverse in 2010 and per capita incomes there have been rising, albeit at a relatively slow pace ever since. As of early 2012, however, many European economies, especially those in the eurozone,

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* For more on the concept of purchasing power parity, see Chapter 15. For more on the use of PPP exchange rates to measure income, see Paul Schreyer and Francette Koechlin, "Purchasing Power Parities—Measurement and Uses," OECD Statistics Brief, March 2002. Available online at www.oecd.org/dataoecd/32/34/2078177.pdf.

† Column 5 reports percentage changes in the ratio of GNP to population. Throughout this text, we will use the notation "^" to denote the percentage change in a variable. For instance, $\hat{x}$ denotes the percentage change in x. If x equals the ratio of two numbers such as per capita GNP (i.e., $x = y/z$ where y = GNP and z = population), a simple approximation rule allows one to determine the rate of growth of x: $\hat{x} = \hat{y} - \hat{z}$. We will make use of this approximation from time to time. In this particular circumstance, the formula states that growth in per capita GNP depends positively on GNP growth but negatively on population growth. If, for instance, GNP is rising by 1 percent but population is growing at 3 percent, then per capita GNP will be falling at 2 percent.

appear to be heading into recession. It is too early to determine whether or not a European recession will spread to the rest of the world.

In some countries, falling per capita GNP is brought on by war (or civil war) in which factories and economic infrastructure (e.g., harbors, public utilities, railroads, airports) are destroyed. In other countries, it may result from declining prices for the commodities (e.g., coffee, copper, cocoa, sugar) on which these economies depend, possibly coupled with misguided government policies aimed at encouraging rapid industrialization. In some countries, negative growth may simply reflect a stagnant economy combined with rapid population growth. No matter the cause, negative growth—especially over long periods—is symptomatic of terrible economic distress.

In contrast, other countries exhibited strong growth over the 2000–2009 period. Several of these countries are located in Eastern Europe, including Bulgaria, Russia, Romania, Poland, and the Slovak Republic. Over the past 20 years, these countries have undergone a remarkable transition, as economic systems that relied on central planning of the production have been dismantled and replaced with private-sector firms. Other countries with strong growth (in excess of 4 percent per year) over this period include Algeria, Argentina, China, Greece, Hong Kong, India, Jordan, Korea, Panama, Peru, Singapore, Sri Lanka, and Thailand.

Why is there a difference in growth rates both within various country groups and between low-income developing economies and high-income developed economies? Economies grow over time because their endowments of factors of production (e.g., labor, capital, and technology) grow, not only in number but in quality. Many economists argue that the main engine of growth is the accumulation of knowledge and skills by workers.* This growth in human capital takes place in schools, in laboratories, and on the job. Investment in plant and equipment that increases physical capital is also important. But what appears to be crucial is that workers function in an environment that requires them to face new challenges and thus to acquire new skills. Such an environment is provided in countries where exports represent a large share of output. The twin challenges of producing goods that will be desired in the global market and competing with producers from other countries for this market place a premium on growth in inventiveness and the continuing acquisition of entrepreneurial, managerial, and technical skills. Without the pressure from outside competitive forces, acquisition of human capital, and thus overall economic growth, may be slow. Hence, it is no surprise that a number of the faster-growing countries in Table 1.1 tend to be more open.

International Trade

International trade has become increasingly important for the world economy. Consider Figure 1.1. There we plot total exports and commodity output (world GDP), measured in real (volume) terms, between 1950 and 2010.† To preserve space, each series of values has been converted into an index number equal to 100 in 1950. As the plot shows, output and exports expanded at roughly the same rates between 1950 and 1960. Beginning in the early 1960s, world exports began to rise much more rapidly than output. In 1973, world exports had risen 500 percent over their level in 1950, while world output was about 200 percent higher. By 1989, world exports were 1,000 percent higher than in 1950, while world output had risen more than 400 percent. As the figure shows, world trade exploded in the 1990s. Between 1990 and 2007, world exports more than doubled. During the same period, world output rose by 56 percent.

What has caused this explosion of world trade? There is no simple answer to the question. One factor that has certainly played an important role has been the reduction in barriers to international trade that has occurred during this period. Barriers to trade include transportation and communication costs. With improvements in technology in these areas, such as

* The argument presented in the remainder of this paragraph is developed more completely in Robert E. Lucas, Jr., "Making a Miracle," *Econometrica* (1993).

† Not included in the export statistics are levels of international trade in commercial services.

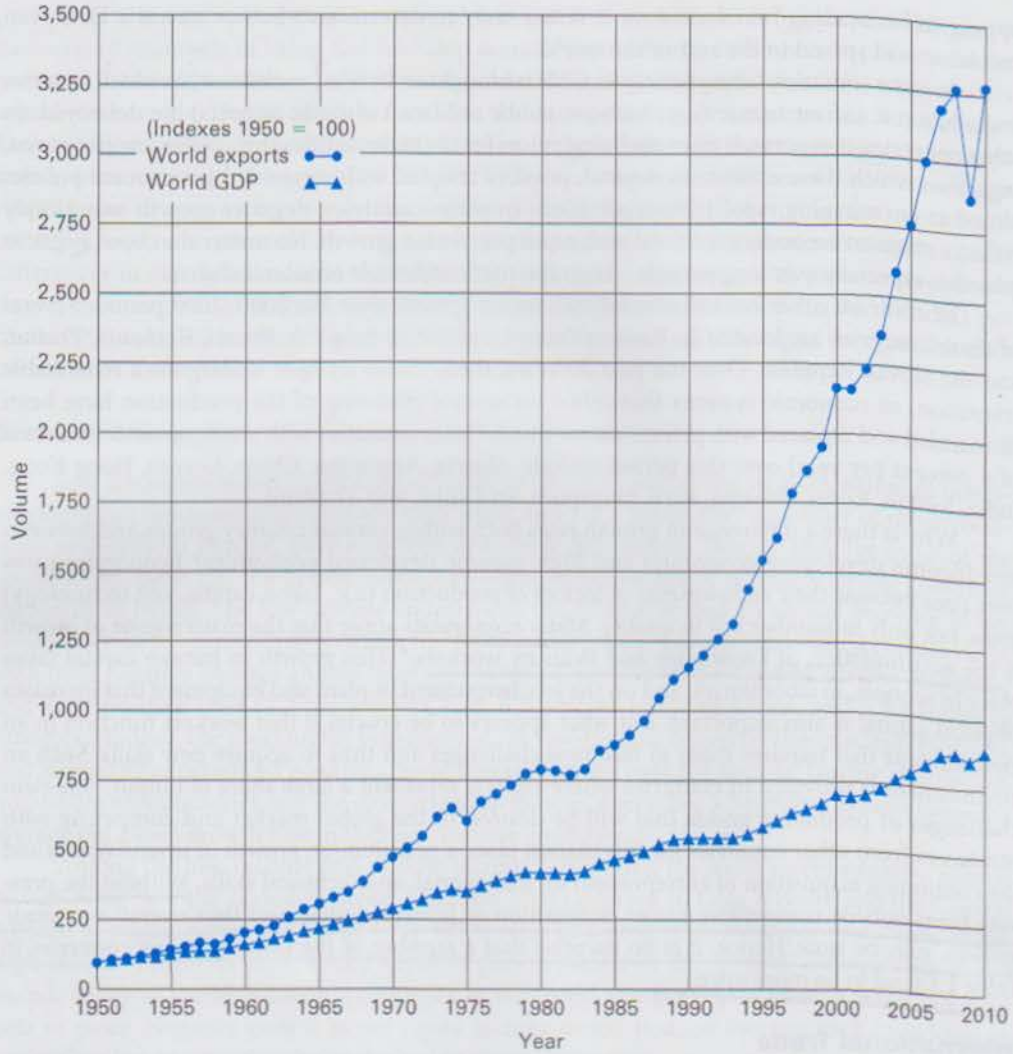

FIGURE 1.1 World Exports and Output in Real Terms: 1950–2010 *Source*: World Trade Organization, *International Trade Statistics 2011*, Table A1.

container ships, supertankers, and satellite telecommunications networks, it is now much easier for sellers in one country to contact consumers in another and to deliver goods to them in a timely fashion.

Barriers to trade also include government-imposed limits on trade, including tariffs and quotas on imports and exports. During the past 40 years, governments around the world, especially in industrialized economies, have entered into a series of multilateral agreements to lower government-imposed barriers to trade. Some of these agreements have been between small groups of countries, such as the formation in 1957 of what is now called the European Union (EU), which has brought virtual free trade across most of Europe. Other agreements, such as the tariff reduction agreements that were reached in the Kennedy Round talks held in the 1960s, the Tokyo Round talks held in the 1970s, and the Uruguay Round talks of the 1980s and early 1990s, have been between a much broader set of countries. These agreements resulted in three successive cuts of over 40 percent in tariff levels of the major industrialized countries. In Chapters 6 and 7 we discuss how tariffs and other policies affect international trade. In Chapters 8 and 9 we

describe this movement to lower trade barriers as well as the creation of several other regional trade agreements and current U.S. trade policy measures.*

As Figure 1.1 shows, world trade has grown virtually every year over the past six decades. Nonetheless, real-world exports did fall in several years, most notably in the mid-1970s, in the early 1980s, in 2001, and most spectacularly in 2009, when real trade volume fell by almost 13 percent from its level in 2008. There is a common feature of all four of these periods: Each marked a time when recessions occurred, especially in the United States and other major industrialized economies. As is discussed more fully in the following section, major economies purchase most of the world's exports. If these countries experience economic downturns, their purchases tend to fall.

As the figure highlights, the behavior of trade in 2009 represents a much different pattern than seen in the three other downturn periods. Indeed, this behavior is so unique that it has been dubbed the *Great Trade Collapse*. Several theories have been offered to explain the collapse. Alessandria, Kaboski, and Midrigan argue that the fall in trade can be explained by a sharp decline in orders for goods that in normal times would have been held as inventory items.† A number of studies blame the trade collapse on the drying up of trade credit.‡ A third group of studies attributes the collapse to the rise of a vertical network of production across countries.** It is unclear if any one of these theories can explain the magnitude of the downturn and its subsequent reversal. All three factors, or possibly others, have probably been responsible.††

The importance of international trade for the countries of the world differs considerably. In columns 6 and 7 of Table 1.1, we present values of the index of openness for the years 1980 and 2009. Let's consider the values for 1980 first. For most countries, the ratio of exports to GDP was between 10 and 40. In other words, for most countries exports accounted for between 10 percent and 40 percent of GDP. The average for all of the countries reported was 29.

The most open country of all was Singapore, with a value of 215 (i.e., exports were more than double its GDP!). Other highly open economies included Hong Kong (index of openness 90), the Congo (60), Malaysia (58), Belgium (57), Togo (51), Jamaica (51), Panama (51), and the Netherlands (51). The most closed economies included Brazil (9), China (6), India (6), and the United States (10). This pattern of behavior for the index of openness points out the fact that larger economies (as measured by area and population) tend to be more closed, while smaller economies tend to be more open. The commonsense explanation of this fact is that smaller economies tend not to be able to produce the many types of products that people want to consume. Thus, there is a need for exports, which can be sold to other countries in exchange for goods not available domestically. Larger countries are better able to diversify their production, especially if these countries possess a wide variety of resources and large endowments of various factors of production.

Between 1980 and 2007, most countries became more open. The average value of the index of openness rose from 29 to 33. However, due largely to the collapse in trade in 2009, the index of openness for many countries was not significantly different in 2009 from what it had been in 1980. Throughout the previous 30 years, virtually all countries in the world had been increasing their openness to trade. As with economic growth, however, changes in openness differed considerably across income groups. On average, low-income economies remained the most closed.

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* For a statistical analysis of some of the factors that have caused trade to rise faster than output, see Mark Dean and Maria Sebastia-Barriel, "Why Has World Trade Grown Faster Than World Output?" *Bank of England Quarterly Bulletin* (Autumn 2004).

† See George Alessandria, Joseph P. Kaboski, and Virgiliu Midrigan, "The Great Trade Collapse of 2008–09: An Inventory Adjustment?" *IMF Economic Review* (2010).

‡ See, for instance, Mary Amity and David E.Weinstein, "Exports and Financial Shocks," *Quarterly Journal of Economics* (2011): and Davin Chor and Kalina Manova, "Off the Cliff and Back? Credit Conditions and International Trade during the Global Financial Crisis," *Journal of International Economics* (forthcoming).

** Julian di Giovanni and Andrei Levchenko, "International Trade, Vertical Production Linkages, and the Transmission of Shocks," *VoxEU*, http://voxeu.org/index.php?q=node/4185 (2009).

†† For more on the Trade Collapse, see Richard Baldwin, ed., *The Great Trade Collapse: Causes, Consequences, and Prospects, Vox EU*, http://www.voxeu.org/index.php?q=node/4297 (2009).

Hong Kong (153), Singapore (148), and Malaysia (82) remained among the most open. Other highly open economies included Belgium (79), the Congo (66), the Netherlands (63), the Slovak Republic (64), and Hungary (65).

In general, countries that were closed in 1980 tended to be more open in 2009. Argentina's index rose from 5 to 18; China's from 6 to 24; Ghana's from 8 to 35; and Mexico's from 11 to 26. By contrast, India (12), Ethiopia (5), Japan (12), and the United States (7) remained relatively closed. It is interesting to note that even though the United States and Japan were two of the most closed economies according to the index of openness, they ranked third and fourth in the value of their exports in 2009 (see column 8). This illustrates the massive size of these two economies relative to other countries in the world. Even though the United States and Japan sell enormous amounts of goods and services on world markets, their exports are small relative to overall economic activity, and hence their indices of openness are very low.

Columns 8 and 9 of Table 1.1 provide data on exports and imports of the various countries listed in the table. A quick comparison of the group averages of the two columns suggests that *on average* there is a rough equality between exports and imports. That is, for some countries (during some years) exports are higher than imports, and vice versa in the remaining cases. However, looking over broader groups of countries for one year or the average trade flows of a typical country over several years (this is not shown in the table), exports and imports have a tendency to balance out. This rough equality between exports and imports is no accident. It illustrates that the revenue earned from selling exports is the primary means countries have for purchasing imports. Without sufficient export sales, imports can be purchased by borrowing. And just as individuals cannot borrow indefinitely, neither can countries. Thus, in some years countries will have to export more than they import to repay their past debts or to build up assets that can be used in future years to purchase imports.

Trade deficits and surpluses

A country has a trade deficit (surplus) if its imports (exports) exceed its exports (imports).

Countries whose imports exceed exports are said to run **trade deficits**. The magnitude of the deficit provides an approximation of the amount of borrowing that a country has undertaken to purchase its imports. Countries with higher levels of exports than imports are said to run **trade surpluses**. The size of a country's trade surplus offers a measure of the amount by which that country has reduced its debt to foreigners or expanded its asset holdings. The trade balance is one measure of a country's balance of payments. In Chapter 11, we will discuss measures of the balance of payments in more detail.

As previously noted, in 2009 the United States was the world's third largest exporter. It was also the world's largest importer and had the world's largest trade deficit. In 2009, Japan was the world's fourth largest exporter, following China, Germany, and the United States. The remainder of the top ten exporters in 2009 were the Netherlands, France, Italy, Belgium, Korea, and the United Kingdom.

The fact that China is now the leading exporting country in the world is one of the most remarkable features of the modern world. China now accounts for more than 10 percent of world exports. Its share of world exports has risen from essentially zero in 1980. In 1995 it held about 2.5 percent of world exports. This growth in world trade shares in such a short period of time is unprecedented. Much of what China exports represents goods that go through various stages of processing in multiple countries, most of which are located in Asia. This vertical network of production chains is one of the major features of modern economic activity.*

THE DIRECTION OF INTERNATIONAL TRADE

We have established that international trade is on the rise. Has trade expanded for all countries at an equal rate? Which countries trade with each other? Have these patterns changed over time? We turn now to addressing these questions. Figure 1.2 provides data on the geographic distribution

* For more on the growth of Chinese exports since 1995, see Steven Husted and Shuichiro Nishioka, "The Rise of Chinese Exports," unpublished working paper, University of Pittsburgh (2012).

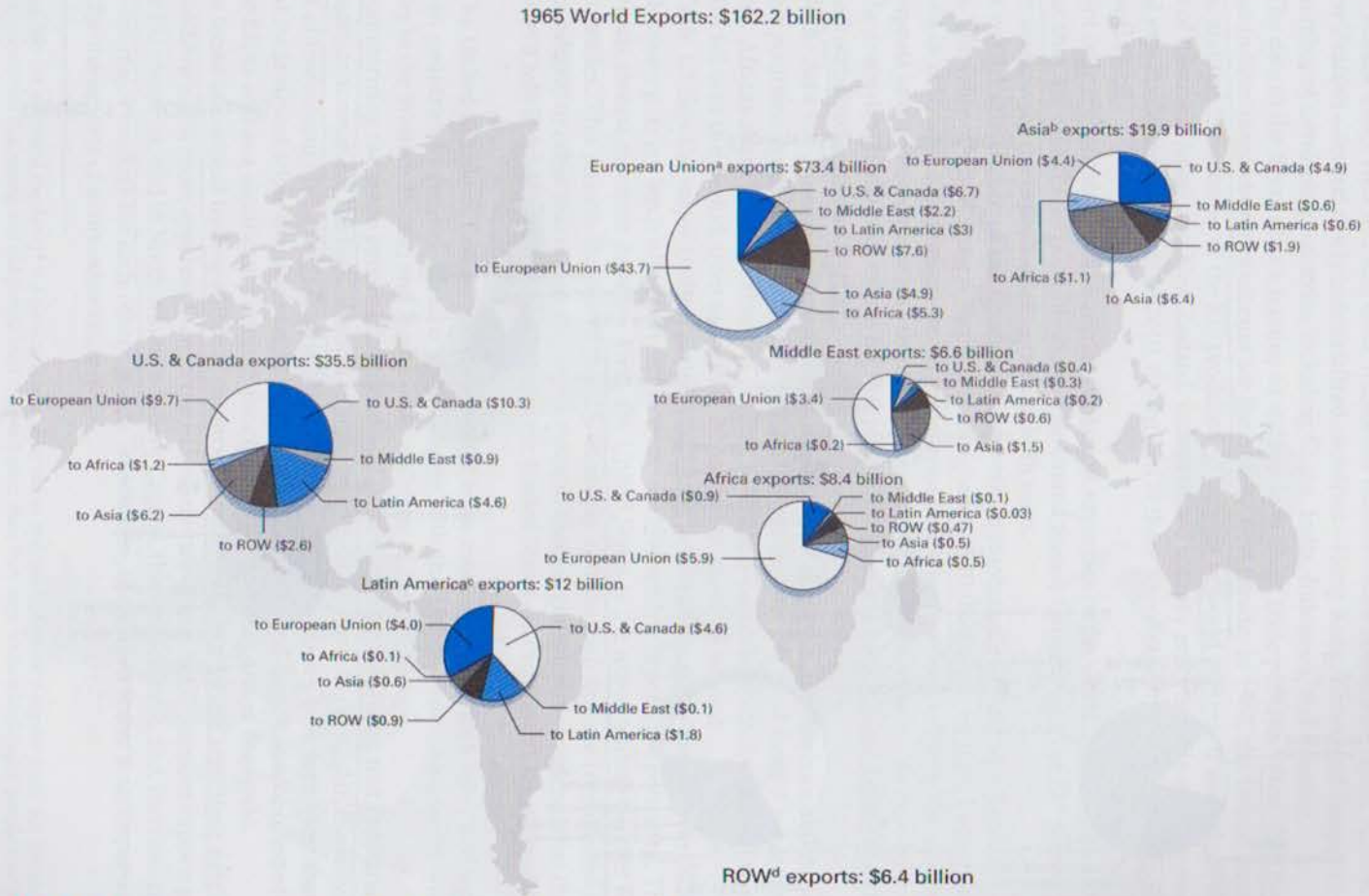

FIGURE 1.2 Geographic Pattern of Merchandise Trade: 1965 and 2010 *Source*: International Monetary Fund, *Direction of Trade Statistics Yearbook* (Washington, D.C.: International Monetary Fund, Bureau of Statistics) and WTO International Trade Statistics 2011, Table A2.

NOTE: [a] European Union: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, United Kingdom.
[b] Asia includes Australia and New Zealand.
[c] Latin America includes Mexico.
[d] ROW: Rest of World.

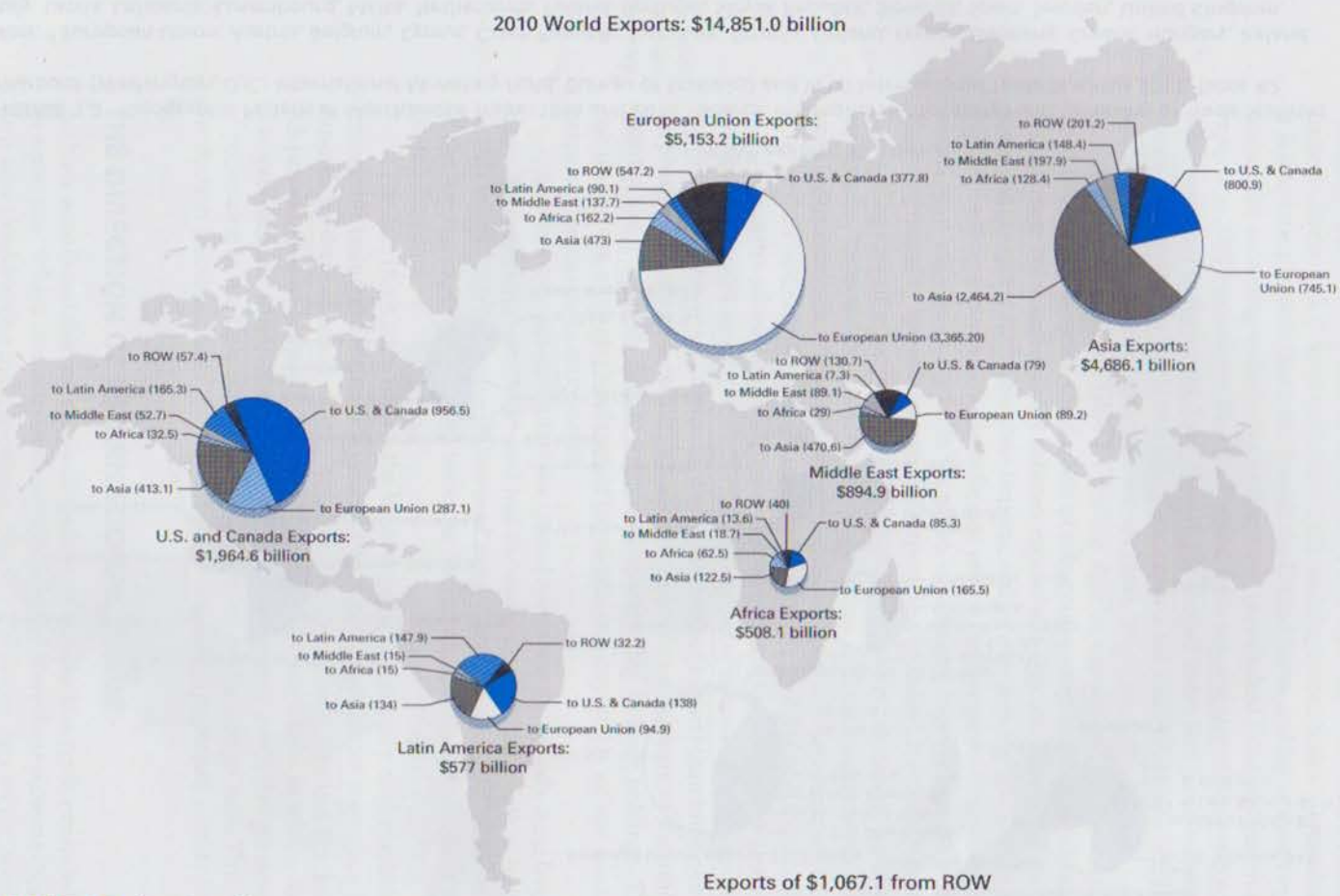

FIGURE 1.2 (*Continued*)

of international trade by region for 1965 and 2010 as well as the overall size of export flows in these two years. Trade is measured in billions of U.S. dollars. Exports from six regions are shown in the figure. These regions include both groups of industrialized countries (e.g., the United States and Canada and the EU) and groups of developing countries (e.g., Latin America, Africa, and the Middle East). Asia includes three traditional industrialized countries—Japan, Australia, and New Zealand—several newly industrialized countries—Hong Kong, Korea, and Singapore—and a number of developing countries, including China, India, Indonesia, and Pakistan.

The data in the figure offer a number of stylized facts about trade patterns.* First, they confirm that industrialized countries account for the bulk of world trade. In 1965, the United States, Canada, and the 25 countries of the EU produced 63 percent of world exports. If we include the exports of Australia, Japan, and New Zealand, industrialized country exports made up 70 percent of world exports during that year.† In 2010, the exports of these 30 countries constituted 55 percent of the world total.

Not only are industrialized countries the largest exporters in the world, but the data indicate that they are also the largest importers. The United States, Canada, and the EU served as primary markets for the exports of all regions in both years.

A remarkable feature of the figure is the growth in importance of Asia as a producer of exports. The value of world exports was 92 times higher in 2010 than it was in 1965, but exports from Asia in 2010 were 235 times greater in value terms than they had been in 1965. The share of Asian exports in total world trade rose from 12 percent to 32 percent in 46 years. As noted previously, the countries chiefly responsible for this phenomenal growth were China, Japan, and the newly industrialized countries (NICs).

While Asia was growing in importance as a producer of exports, Latin America and Africa saw their positions erode. Latin America's share of world exports declined from 7 percent to 4 percent. Africa's share fell from almost 5 percent to about 3 percent. North America's export share also fell over this period, from more than 20 percent to about 13 percent.

Table 1.2 lists the major trading partners of a selected set of countries for the year 2010. For each country, its top ten trading partners in terms of merchandise exports are presented. The table reveals several common patterns. First, the United States is the major trading partner for many countries. This reflects the size of the U.S. economy and the high income levels found in America relative to other markets in the world. Second, there is considerable evidence that distance plays a role in trade patterns. Canada and the United States are each other's largest trading partner.

The United Kingdom, France, and Germany all trade extensively with each other and with European countries in general. Mexico trades largely with the United States; Singapore, with countries in the Western Pacific; and Russia, with countries of Eastern Europe.

Summarizing the trade patterns described in this section, we have shown that industrialized countries account for the bulk of world exports and world imports. In particular, the largest amount of trade occurs between industrialized countries. Asian countries have seen their share in world trade almost triple over the past 45 years, with Asia the second-largest source of exports after the EU as well as a significant customer for exporters from other parts of the world.

In terms of national trading patterns, countries tend to trade extensively with their neighbors. Nowhere is this more apparent than in the EU, where two-thirds of EU member exports go to other EU countries, and in North America, where Canada, the United States, and, increasingly, Mexico are major markets for each other's goods. In addition, the United States is an important market for the exports of many other countries.

Gravity Model

* A stylized fact (or empirical regularity) is a pattern that is observed in real-world data on a regular basis. For instance, the regular occurrence that young and old people tend to spend more than they earn while middle-aged people save is a stylized fact of consumption behavior.

† The export levels for these three countries are included in the exports of Asia. In 1965, they totaled $12.5 billion, of which Japan's share was $8 billion. In 2010, the exports of these countries totaled $1,200 billion; Japan's share that year was $770 billion.

TABLE 1.2 Top Ten Trading Partners of Selected Countries, 2010

(Percentage of Total Merchandise Exports)

United States		United Kingdom		China	
CANADA	19.43	UNITED STATES	14.35	UNITED STATES	17.98
MEXICO	12.79	GERMANY	10.84	HONG KONG	13.84
CHINA	7.19	NETHERLANDS	7.84	JAPAN	7.67
JAPAN	4.74	FRANCE	7.69	KOREA	4.36
UNITED KINGDOM	3.79	IRELAND	6.21	GERMANY	4.31
GERMANY	3.76	BELGIUM-LUXEMBOURG	4.93	NETHERLANDS	3.15
KOREA	3.04	SPAIN	3.67	INDIA	2.59
BRAZIL	2.77	ITALY	3.33	UNITED KINGDOM	2.46
NETHERLANDS	2.74	CHINA	2.76	SINGAPORE	2.05
SINGAPORE	2.28	SWEDEN	2.04	ITALY	1.97
Germany		**Japan**		**Canada**	
FRANCE	9.45	CHINA	19.41	UNITED STATES	74.86
UNITED STATES	6.83	UNITED STATES	15.65	UNITED KINGDOM	4.08
NETHERLANDS	6.59	KOREA	8.10	CHINA	3.33
UNITED KINGDOM	6.20	OTHER ASIA, n.e.s.	6.82	JAPAN	2.31
ITALY	6.10	HONG KONG	5.50	MEXICO	1.26
AUSTRIA	5.60	THAILAND	4.44	GERMANY	0.95
CHINA	5.59	SINGAPORE	3.28	KOREA	0.93
BELGIUM-LUXEMBOURG	4.84	GERMANY	2.65	NETHERLANDS	0.81
SWITZERLAND	4.39	MALAYSIA	2.29	BRAZIL	0.65
POLAND	3.97	NETHERLANDS	2.13	NORWAY	0.64
Mexico		**Brazil**		**India***	
UNITED STATES	80.07	CHINA	15.25	UNITED ARAB EMIRATES	14.38
CANADA	3.57	UNITED STATES	9.64	UNITED STATES	10.82
CHINA	1.41	ARGENTINA	9.17	CHINA	5.87
SPAIN	1.28	NETHERLANDS	5.07	HONG KONG	4.05
BRAZIL	1.27	GERMANY	4.03	OTHER ASIA, n.e.s.	3.88
COLOMBIA	1.26	JAPAN	3.54	SINGAPORE	3.86
GERMANY	1.19	UNITED KINGDOM	2.30	UNITED KINGDOM	3.69
JAPAN	0.64	CHILE	2.11	NETHERLANDS	3.66
CHILE	0.62	ITALY	2.10	GERMANY	3.31
NETHERLANDS	0.62	RUSSIA	2.06	SAUDI ARABIA	2.19
Singapore*		**Egypt**		**Russia**	
HONG KONG	11.58	ITALY	8.35	NETHERLANDS	14.26
MALAYSIA	11.46	SPAIN	6.16	OTHER ASIA, n.e.s.	13.35
CHINA	9.75	SAUDI ARABIA	5.88	ITALY	6.51
INDONESIA	9.68	UNITED STATES	5.88	CHINA	5.30
UNITED STATES	6.56	INDIA	4.66	GERMANY	4.25
KOREA	4.66	LIBYA	4.63	POLAND	3.81
JAPAN	4.55	TURKEY	3.74	TURKEY	3.75
AUSTRALIA	3.92	SYRIA	3.60	UKRAINE	3.65
THAILAND	3.74	UNITED KINGDOM	3.51	JAPAN	3.35
INDIA	3.43	FRANCE	3.09	UNITED STATES	3.23

* 2009 data.

Source: 2010 International Trade Statistics Yearbook, UN Comtrade Data Web site, http://comtrade.un.org/pb/

The country trade patterns described in this section have been put to a number of empirical tests by international trade economists. These economists use *gravity models* to try to predict which countries will tend to trade with each other.* A gravity model is a statistical model that estimates a country's trade flows to other countries based on the economic characteristics of the two trading partners. The basic prediction of the gravity model is that any two countries will trade more with each other when their combined GNPs are larger and the geographical distance between them is smaller. It should be no surprise, given the results reported in this section, that economists have found that gravity models explain trade very well.

WHAT GOODS DO COUNTRIES TRADE?

Up to this point we have established that trade is an important (on average accounting for almost 40 percent of GDP) and rapidly growing part of the world economy. We have also described a series of stylized facts about aggregate trade patterns. In this section we present some information on the individual goods that countries trade. Before we consider major exports and imports of individual countries, let's examine which goods are most likely to be traded.

Consider Table 1.3. There, goods are ranked according to their share (by value) in world trade in 2010.† Petroleum was the largest single traded item (by value) in 2007, up from fourth position in 1999. As the table shows, the value of petroleum exports in 2010 was roughly triple what it had been in 2003. Petroleum's number one ranking that year (and probably again in 2012) was due to two related factors. First, rising incomes throughout many developing countries from 2002 and continuing through the Great Recession period spurred demand for oil. Second, combined with the demand from industrialized countries, world demand increased relative to world supply, and prices rose consistently over much of this period. Because the demand for oil is quite inelastic, total spending on oil rose as prices increased. In 2010, office machines, computers, and parts ranked third (by value), and automobile exports ranked fourth. All three of these products have consistently ranked in the top three world exports over the past 15 years.

Clothing, transistors (e.g. semiconductors, microprocessors, television picture tubes, and other electronic components), organic chemicals, telecommunications equipment, pharmaceuticals, and iron and steel rounded out the top ten traded commodity categories. Many Americans might have been able to guess that these goods would appear at the top of the world imports list. Over the past several decades, Americans have become familiar with news stories about oil imports from the Mideast; steel mills closing down in Pittsburgh, Gary (Indiana), and elsewhere; unemployed autoworkers moving from Michigan to Texas; and apparel makers urging Americans to look for the *Made in America* logo. In short, because the United States imports more products than any other country in the world, it should not be surprising that the goods most commonly traded are some of America's major import items.

Table 1.3 goes on to list other products commonly traded in world markets. These products include wood products and paper, petroleum products, chemicals, pharmaceuticals, and aircraft. Many of these products are exports of the United States.

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* For more on the theory behind gravity models, see James Anderson, "A Theoretical Foundation for the Gravity Equation," *American Economic Review* (1979); and Jeffrey H. Bergstrand, "The Gravity Equation in International Trade: Some Microeconomic Foundations and Empirical Evidence," *Review of Economics and Statistics* (1985). Some recent examples of empirical studies include Andrew Rose, "One Money, One Market: Estimating the Effects of Common Currencies on Trade," *Economic Policy* (2000); and James Anderson and Eric van Wincoop, "Gravity with Gravitas: A Solution to the Border Puzzle," *American Economic Review* (2003).

† Industries are identified in the left-hand column of this table according to the Standard International Trade Classification (SITC) code. This code divides industries into ten very broad groups numbered 0 to 9. Within each broad category, industries are further divided according to the specific type of production that occurs. These industry groupings are given two-digit identification numbers, with the first of these digits being the same as the major industry group. For instance, road vehicles are identified as industry 78 within group 7 (machines and transport equipment). Even more detail can be found by considering three-digit industries. Thus, passenger motorcars are classified as industry 781.

TABLE 1.3 World Trade in Major Products: 1999, 2003, 2006, 2010

(Rank, value in billions of $, percent share)

SITC code	Product	1999			2003			2006			2010		
		Rank	Value	Share	Rank	Value	Share	Rank	Value	Share	Rank	Value	Share
333	Crude petroleum	4	216.5	4.1	3	385.3	5.5	1	991.9	8.3	1	1,100.2	7.3
334	Petroleum products	14	106.3	2.0	11	183.2	2.6	5	426.1	3.6	2	674.4	4.5
751+752+759	Office machines, computers, parts	1	306.1	5.8	1	763.6	10.9	2	545.4	4.6	3	576.2	3.8
781	Passenger motor cars	2	294.2	5.6	2	393.3	5.6	3	533.3	4.5	4	559.0	3.7
776	Transistors, valves, etc.	3	224	4.3	4	292.9	4.2	4	490.4	4.1	5	543.5	3.6
54	Medicinal & pharmaceutical prods.	15	104.6	2.0	8	213.5	3.0	8	320.3	2.7	6	456.9	3.0
764	Telecom equipment and parts	6	169.3	3.2	7	227.6	3.2	6	407.0	3.4	7	446.1	3.0
67	Iron and steel	10	130.7	2.5	10	185.6	2.6	7	367.0	3.1	8	415.4	2.8
84	Clothing	5	185.3	3.5	5	235.0	3.4	9	311.6	2.6	9	370.1	2.5
51	Organic chemicals	12	116.0	2.2	13	175.5	2.5	10	298.7	2.5	10	334.4	2.2
784	Motor vehicle parts	9	132.1	2.5	12	178.8	2.5	11	253.8	2.1	11	301.2	2.0
34	Gas, natural and manufactured	26	51.2	1.0	17	103.4	1.5	12	229.5	1.9	12	268.2	1.8
65	Textiles	8	147.2	2.8	9	186.2	2.7	13	206.2	1.7	13	258.8	1.7
58+893	Artificial resins, plastics	7	164.0	3.1	6	233.5	3.3	15	179.5	1.5	14	223.2	1.5
63+64	Wood manufactures, paper	11	128.3	2.4	14	157.1	2.2	14	202.7	1.7	15	216.7	1.4
772	Electrical parts for circuits	16	77.5	1.5	16	103.5	1.5	16	165.2	1.4	16	204.6	1.4
287+288+682	Copper, copper ore, scrap	27	50.9	1.0	28	64.7	0.9	17	162.8	1.4	17	194.8	1.3
05	Fruit and vegetables	17	71.8	1.4	18	90.9	1.3	18	134.7	1.1	18	180.4	1.2
22+42+081	Oilseeds, veg. oils, oil cakes	25	51.3	1.0	25	70.8	1.0	25	98.9	0.8	19	178.5	1.2
793	Ships and boats	34	40.1	0.8	34	52.7	0.8	40	53.9	0.5	20	168.8	1.1
874	Measuring instruments	19	64.3	1.2	19	85.2	1.2	21	127.4	1.1	21	153.2	1.0
281+282	Iron ore and scrap	39	31.7	0.6	45	24.6	0.4	32	80.0	0.7	22	147.4	1.0
792	Aircraft	13	110.0	2.1	15	117.1	1.7	19	132.0	1.1	23	137.6	0.9
713	Piston engines	18	66.4	1.3	21	83.4	1.2	22	122.3	1.0	24	137.0	0.9
821	Furniture	22	57.2	1.1	23	78.6	1.1	23	116.9	1.0	25	129.1	0.9
287+684	Bauxite, alumina, aluminum	21	59.4	1.1	24	78.1	1.1	20	128.0	1.1	26	128.6	0.9
667	Pearls & precious stones	31	44.9	0.9	29	60.5	0.9	28	86.4	0.7	27	127.5	0.8
04	Cereal grains and preparations	23	55.2	1.1	27	67.9	1.0	30	84.0	0.7	28	127.1	0.8
62	Rubber articles	33	43.0	0.8	32	54.9	0.8	27	86.9	0.7	29	116.4	0.8
32	Coal	46	18.5	0.4	44	26.2	0.4	37	68.0	0.6	30	114.7	0.8
01	Meat and preparations	32	43.5	0.8	30	55.4	0.8	35	76.9	0.6	31	111.8	0.7
782	Lorries, special vehicles	24	54.0	1.0	26	69.9	1.0	24	107.5	0.9	32	103.9	0.7
03	Fish and preparations	28	47.0	0.9	20	84.3	1.2	29	85.3	0.7	33	101.9	0.7
851	Footwear	35	39.7	0.8	36	47.8	0.7	34	79.4	0.7	34	96.0	0.6

723	Civil engineering equip.	45	24.6	0.5	43	33.4	0.5	31	80.4	0.7	35	95.6	0.6
741	Heating and cooling equip.	36	38.6	0.7	35	50.4	0.7	33	79.8	0.7	36	94.7	0.6
52	Inorganic chemicals	41	31.1	0.6	39	38.3	0.5	36	74.6	0.6	37	91.1	0.6
894	Toys, sporting goods	30	44.9	0.9	33	53.1	0.8	26	90.7	0.8	38	87.2	0.6
07	Coffee, tea, cocoa, spices	40	31.1	0.6	42	33.5	0.5	42	50.0	0.4	39	80.8	0.5
714	Engines and motors, n.e.s.	29	46.6	0.9	31	55.2	0.8	38	67.5	0.6	40	76.2	0.5
02	Milk and products, eggs	44	26.9	0.5	41	34.0	0.5	43	48.0	0.4	41	70.7	0.5
112	Alcoholic beverages	42	30.0	0.6	38	38.6	0.6	41	51.9	0.4	42	64.2	0.4
24	Cork and wood	37	36.9	0.7	37	38.7	0.6	39	59.7	0.5	43	53.0	0.4
26-266-267	Natural textile fibers	47	14.1	0.3	46	15.1	0.2	46	21.3	0.2	44	27.4	0.2
749	Non-electric machinery parts	20	61.1	1.2	22	16.1	0.2	45	22.2	0.2	45	25.4	0.2
881+882+883	Photo apparatus and supplies	38	32.1	0.6	40	35.0	0.5	44	36.2	0.3	46	25.0	0.2
Total of Above			3,920.0	74.6		5,672.4	80.9		8,442.2	71.0		10,194.9	67.7
Total World Merchandise Trade in $ billions			5,257			7,013.0			11,888			15,060	

Note: [a] n.e.s = Not elsewhere specified.

Source: United Nations, *2010 International Trade Statistics Yearbook*, United Nations Comtrade Web site http://comtrade.un.org/pb/

Note that, with rare exceptions, the most commonly traded goods tend to be agricultural products, raw materials, semi-manufactured goods, or capital goods (e.g., petroleum, iron and steel, textiles, office equipment, cereal grains, automobile parts, natural gas, plastics, chemicals, wood, fruits and vegetables, oilseeds, aircraft, and telecommunications equipment). Very few imports appear to compete directly in world markets for the types of goods purchased by consumers.* Rather, a relatively common pattern seems to be that countries import raw materials or partially manufactured products and then complete the manufacturing process before marketing a good.

Since the late twentieth century there has been a marked increase in trade in partially manufactured products. Corporations have taken advantage of falling transportation costs and lower trade barriers to locate various parts of their production and assembly operations throughout the world. This behavior is known as *global production* (or outsourcing), and it is one of the chief factors in explaining the growth in world trade. Some economists have argued that the increase in global production may help explain the growing wage gap between skilled and unskilled workers in the United States and elsewhere.† For more on the relationship between trade and wages, see Chapter 4. For more on outsourcing, see Chapter 10.

Not included in Table 1.3 is any information regarding international trade in services. Trade in services is a growing part of world commerce. In 2010, world trade in services totaled $3.5 trillion, accounting for almost 25 percent of all international trade. There are three main categories of services that are traded internationally: transportation services, travel services, and other. Trade in transportation services involves the hiring by residents of one country of another country's boats, airlines, or motor vehicles to move goods or people from one place to another. For instance, it is often the case that American firms hire ships from other countries, such as Panama, to move goods to foreign ports. The amounts paid for the use of these vessels represent an American import of transportation services. In 2010, transportation services accounted for about 21 percent of all services trade.

Travel services include purchases of certain items by residents of one country when they travel to another country. These purchases include such items as lodging, food, tours, and so on. Travel services represented about one-fourth of international services exports in 2010. Many countries that are highly regarded as vacation sites, such as the Bahamas and Jamaica, depend heavily on the export of travel services.

Examples of other services trade include banking, medicine, consulting, insurance, and education. For example, when foreign students enroll at an American university, that is an American export of education. Other services represented slightly more than 50 percent of world trade in services in 2007.

As is the case with merchandise, major industrial countries play a leading role in the international trade of services. In 2010, the United States exported $518 billion in services and imported $358 billion, ranking first in both categories. Germany was the second-largest services exporter ($232 billion), followed by the United Kingdom ($227 billion), China ($170 billion), and France ($143 billion). Germany was the second-largest importer of services ($260 billion) in 2010, followed by China ($192 billion), the United Kingdom ($161 billion), and Japan ($156 billion).‡

Table 1.4 provides some detail on the merchandise exports from selected countries for the year 2010.** Consider exports of the United States (column 1). More than one third of these goods

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* Exceptions, of course, are passenger motorcars, home computers, clothing, and toys.

† See Robert C. Feenstra and Gordon Hanson, "Global Production Sharing and Rising Inequality: A Survey of Trade and Wages," in E. Kwan Choi and James Harrigan, eds., *Handbook of International Trade* (Oxford: Blackwell, 2003), 146–185.

‡ The World Trade Organization (WTO) has recently begun efforts to provide information on services trade and its importance relative to trade in merchandise. For more, see the *WTO Annual Report* (Geneva: World Trade Organization) or go to http://www.wto.org.

** This table also uses SITC codes to identify industries.

TABLE 1.4 Broad Categories of Exports of Selected Countries, 2010

SITC Code	Product	United States	Germany	Japan	China	United Kingdom	France	Canada	Mexico	Brazil	Singapore	Egypt
0	Food and live animals	6.47	4.17	0.51	2.61	3.84	8.55	7.38	4.78	22.90	1.14	15.23
01	Meat	1.04	0.79	0.01	0.16	0.53	0.94	1.14	0.23	6.75	0.02	0.04
04	Cereal grains	1.81	0.60	0.05	0.08	0.74	2.16	2.16	0.38	1.40	0.06	1.97
1	Beverages and tobacco	0.43	0.78	0.08	0.12	2.26	2.93	0.25	1.12	1.45	0.68	0.42
12	Tobacco products	0.13	0.36	0.04	0.06	0.13	0.15	0.05	0.10	1.40	0.17	0.38
2	Crude materials	6.35	1.85	1.41	0.74	2.46	2.36	8.59	1.66	26.67	0.58	4.98
24	Cork and wood	0.38	0.22	0.01	0.07	0.04	0.18	1.51	0.03	0.53	0.02	0.08
3	Mineral fuels	6.32	1.88	1.69	1.69	12.60	3.66	23.80	13.77	10.05	16.12	28.67
32	Coal and coke	0.79	0.04	0.04	0.23	0.09	0.01	1.58	0.01	0.00	0.00	0.72
33	Petroleum products	4.91	1.14	1.64	1.29	11.15	2.65	17.10	13.64	9.88	16.06	18.95
4	Fats and oils	0.35	0.19	0.02	0.02	0.16	0.28	0.65	0.04	0.83	0.13	0.57
5	Chemicals	14.78	14.74	10.19	5.55	17.89	17.84	8.57	3.97	6.20	11.29	13.41
6	Basic manufactures	9.36	13.00	12.96	15.79	11.03	11.99	13.04	7.52	11.83	3.82	20.62
65	Textiles	0.95	1.04	0.92	4.87	0.92	1.11	0.49	0.65	0.55	0.23	4.90
67	Iron and steel	1.35	2.50	5.45	2.51	1.91	3.17	1.82	1.52	4.51	0.79	3.34
68	Nonferrous metals	1.25	2.07	1.87	1.14	2.21	1.28	4.26	1.63	1.35	0.89	4.29
7	Machines and transport equip.	35.17	46.01	59.50	49.51	31.63	39.00	26.14	55.58	16.78	51.05	4.29
75	Office machines and computers	3.59	2.13	2.69	13.06	2.20	1.13	0.78	5.35	0.19	8.44	0.08
761	Televisions	0.30	0.17	0.14	1.40	0.18	0.14	0.10	6.80	0.05	0.19	0.04
763	Sound recorders, phonographs	0.23	0.19	1.25	1.33	0.35	0.08	0.11	0.11	0.00	0.31	0.00
78	Motor vehicles	7.44	15.47	18.84	2.81	8.86	9.01	12.36	17.26	5.87	1.16	0.38
792	Aircraft	0.58	2.38	0.33	0.08	0.00	9.07	2.49	0.20	2.21	1.31	0.00
8	Misc. manufactures	10.48	10.15	7.59	23.89	11.78	10.67	4.92	9.09	2.38	6.98	7.67
84	Clothing	0.37	1.34	0.07	8.23	1.38	1.95	0.30	1.46	0.08	0.30	4.86
851	Footwear	0.09	0.29	0.01	2.26	0.32	0.41	0.06	0.13	0.83	0.07	0.08
88	Photographic equip.	0.67	0.59	1.95	0.75	0.68	0.64	0.19	0.27	0.06	0.85	0.00
9	Other goods	10.31	7.23	6.03	0.09	6.35	2.72	6.66	2.47	0.92	8.21	4.18

Source: United Nations, *2011 International Trade Statistics Yearbook*, United Nations Comtrade Web site, http://comtrade.un.org/pb/

were machines and transport equipment. Within this group, motor vehicles (mostly exports of autos to Canada) accounted for almost 8 percent of all U.S. exports. Aircraft represented about 1 percent of exports, and office machines (including computers) accounted for almost 4 percent. Other major U.S. export sectors included food—the bulk of that category was exports of cereal grains (e.g., wheat)—crude materials (including paper and pulp wood), chemicals, and basic manufactures.

Almost all of Japan's exports (see column 3) came from basic manufactures (13.0 percent) and machines and transport equipment (59.5 percent). Iron and steel exports made up about one half of the exports of basic manufactures. Motor vehicles accounted for about one-third of machines and transport equipment exports.

Let's compare for a moment the differences between U.S. and Japanese export patterns. The United States exports a wide variety of products, with significant amounts from all major industry categories except beverages and tobacco and animal and vegetable fats. Japan's exports are concentrated in only two industry categories. What could explain this difference?

One answer has to do with the availability of resources. The United States is an enormous country with vast tracts of farm and forest lands. It also has a large and skilled workforce and abundant capital. Thus, it has the resources to be able to produce a wide variety of goods. Japan is a very small country with virtually no natural resources. Farmland is extremely scarce. On the other hand, Japan has a large and skilled workforce. Over time, its firms have invested in new plants and equipment. Thus, Japan has the resources needed to produce manufactured goods, but not those required to produce enough food or crude (raw) materials to feed its population or supply its factories.

We have presented some possible reasons for differences between U.S. and Japanese export patterns. The types of goods each country imports provide additional (but not complete) support to the explanation given earlier. Consider Table 1.5. More than 18 percent of U.S. imports in 2010 comprised mineral fuels. This reflects the fact that U.S. petroleum supplies are not plentiful enough to accommodate needs. Other major import categories for the United States included manufactured goods—trade that is not necessarily consistent with the lack of domestic resources needed to manufacture such items.

Similar to its export pattern, Japan's imports were much more concentrated. Mineral fuels were the largest import category, accounting for about 29 percent of total imports. Raw materials and food made up another 15 percent of total imports. That is, more than 40 percent of Japanese imports can be explained by the fact that Japan has very limited natural resources.

Thus, the following trade patterns emerge for these two countries: Japan exports manufactured products to the rest of the world in exchange for food, raw materials, and fuel. The United States exports manufactured goods, but also raw materials and food. It imports fuel, tropical products, and many kinds of manufactured products.

This discussion of U.S.–Japanese trade patterns is an illustration of the analysis of the commodity composition of trade. Such analysis seeks to answer this question: Which countries trade what to whom? Because there are so many goods and countries in the world and such a wide variety of economic activity, it is extremely difficult to describe, much less to understand, all that is going on. As a result, international economists have sought to build economic theories—models of international commerce that make certain simplifying assumptions so that fundamental patterns of activity can be understood. In the chapters to come we set out to build several such theories. For instance, the theory that countries export goods based on the quantities of resources and factors of production that are locally available is known as the Heckscher-Ohlin theory of comparative advantage. This theory is discussed in detail in Chapter 4. Other theories of international trade are discussed in Chapters 3 and 5. First, however, in Chapter 2 we discuss the general approach economists take in building their models of economic activity.

TABLE 1.5 Broad Categories of Imports of Selected Countries, 2010

SITC Code	Product	United States	Germany	Japan	China	United Kingdom	France	Canada	Mexico	Brazil	Singapore	Egypt
0	Food and live animals	3.79	5.68	7.62	1.55	7.63	7.08	5.86	4.84	3.91	2.19	14.91
01	Meat	0.27	0.71	1.60	0.16	1.40	0.98	0.58	1.12	0.12	0.25	1.92
04	Cereal grains	0.34	0.45	1.16	0.13	0.65	0.61	0.67	1.28	1.56	0.23	6.69
1	Beverages and tobacco	0.89	0.74	0.93	0.17	1.56	0.93	0.98	0.30	0.28	0.72	0.81
12	Tobacco products	0.07	0.19	0.57	0.06	0.26	0.37	0.04	0.06	0.04	0.17	0.69
2	Crude materials	1.54	3.81	7.93	15.18	2.63	2.51	2.72	2.91	2.49	0.70	7.36
24	Cork and wood	0.24	0.23	0.90	0.76	0.42	0.32	0.36	0.15	0.02	0.05	1.77
3	Mineral fuels	18.44	11.43	28.68	13.54	11.23	13.80	10.06	7.98	16.60	26.11	13.45
32	Coal and coke	0.11	0.59	3.52	1.30	0.52	0.52	0.32	0.37	1.98	0.00	0.56
33	Petroleum products	17.20	7.53	18.19	11.76	8.67	10.01	8.51	6.30	12.36	26.11	9.46
4	Fats and oils	0.23	0.37	0.21	0.65	0.33	0.36	0.23	0.44	0.41	0.22	1.93
5	Chemicals	9.00	12.60	8.78	10.70	12.08	14.12	10.60	11.30	17.91	6.67	11.90
6	Basic manufactures	10.33	12.60	8.48	9.40	12.22	12.85	12.28	13.60	12.67	6.11	20.52
65	Textiles	1.19	1.17	1.04	1.27	1.21	1.25	1.06	1.71	2.09	0.34	3.84
67	Iron and steel	1.57	2.74	1.26	1.79	1.45	2.66	2.73	2.76	3.26	1.51	6.34
68	Nonferrous metals	1.78	2.75	2.60	3.53	2.43	1.81	1.43	2.00	2.29	1.18	1.57
7	Machines and transport equip.	37.03	33.97	23.30	39.38	31.50	34.12	41.11	47.23	39.33	46.31	24.42
75	Office machines and computers	6.12	3.72	3.63	4.07	3.83	2.71	3.21	4.96	2.78	5.72	0.95
761	Televisions	1.57	0.68	0.87	0.01	0.86	0.81	0.76	0.56	0.13	0.27	0.15
763	Sound recorders, phonographs	0.62	0.38	0.64	0.33	0.69	0.36	0.49	0.36	0.19	0.43	0.06
78	Motor vehicles	9.27	7.02	2.08	3.53	9.38	9.13	14.57	8.14	9.11	1.41	7.03
792	Aircraft	0.97	2.43	0.62	0.89	0.00	4.08	1.38	0.11	1.27	1.77	0.01
8	Misc. manufactures	15.26	10.97	12.20	8.11	15.21	14.11	12.28	9.43	6.40	7.00	4.60
84	Clothing	4.17	3.06	3.88	0.18	4.13	3.64	2.12	0.76	0.75	0.63	1.15
851	Footwear	1.12	0.69	0.69	0.08	1.00	1.00	0.49	0.21	0.20	0.16	0.24
88	Photographic equip.	0.60	0.53	0.91	1.03	0.66	0.78	0.46	0.48	0.43	1.05	0.25
9	Other goods	3.49	7.83	1.88	1.32	5.59	0.12	3.87	1.98	0.00	3.95	0.10

Source: United Nations, *2011 International Trade Statistics Yearbook*, United Nations Comtrade Web site, http://comtrade.un.org/pb/

Summary

1. International trade is a small but growing part of world economic activity. Over the past four decades international trade has expanded by more than 2,000 percent in volume terms.
2. Industrialized countries are the major participants in world trade today. They account for more than 60 percent of total world exports. Much of their trade is with each other. They are also the largest markets for the products of developing countries.
3. The United States is the largest single participant in international trade (measured by the sum of imports and exports). It is a major trading partner for many other countries.
4. Most countries tend to trade extensively with their neighbors.
5. Although automobiles currently rank third in world exports (in value terms), most of the goods that enter international trade are agricultural products, raw materials, semimanufactured goods, or capital goods.

Exercises

1. Explain why neighboring countries tend to trade extensively with each other.
2. Use the information in Tables 1.4 and 1.5 and your knowledge of the Brazilian economy to summarize and explain the trade pattern of Brazil.
3. Find five interesting facts in Table 1.1.
4. Find five interesting facts in Tables 1.4 and 1.5.
5. Compare the export rankings of the top ten leading exports of 1999 with the rankings of the top ten leading exports in 2010 (see Table 1.3). Discuss some of the reasons why these rankings have changed so dramatically.
6. Use Table 1.1 to find the three most open economies in 2009, and the three most closed. How does the growth performance of these countries compare with the growth of the average country in the table?
7. Use Table 1.1 to find three countries that have gone from being mostly closed to being open from 1980 to 2009. Also, find three countries where the reverse has happened. What has been the implication for growth, if any?
8. According to Figure 1.2, intra-European Union trade accounts for a huge proportion of EU trade. What factor or factors might account for this fact?
9. According to Figure 1.2, the EU is a major customer of exports from Africa and the Middle East. What types of products do you think these areas produce for export, and why do you think the EU is their best customer?
10. Use Table 1.5 to compare and contrast the import patterns of China and the United States.

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