

Preface

This book is an introduction to international economics with an emphasis on applications to Japan. I wrote this book with specific purposes in mind.

In recent years, a number of Japanese universities have introduced degree programs in which all or most classes are taught in English. Many of these programs are designed for students wishing to pursue an international career after graduation and include international economics as one of the core subjects. For the past few years, I myself have been teaching a course on international economics in English.

Soon after I started teaching this course, however, I realized that most of the existing English-language textbooks on international economics are not suited for classes at Japanese universities. The reasons are twofold.

First, the majority of the English-language textbooks are written by professors who are teaching in the United States or other English-speaking countries. Not surprisingly, these textbooks are written in a manner that most appeals to students in these countries, with a host of interesting case studies on North America and some references to Europe but comparatively few applications to countries in other regions.

Nevertheless, students taking English-based courses at Japanese universities are either Japanese students or non-Japanese students who came to Japan because they are interested in the country. Although international economics is in principle a general subject not tied to any specific country, there is little doubt that students' learning experience will be most fruitful when the subject is studied in the context of a country or countries in which they are interested. By studying with an American textbook, students in Japan may learn a lot about the United States, but will miss an opportunity to apply what they have studied to the society in which they live.

Second, most of the existing English-language textbooks are, in my opinion, simply too voluminous. Many of the Japanese university students studying on English-based programs are in the process of transitioning from studying English to studying academic subjects in English—a process that can be quite challenging. Accordingly, instructors of these courses need to be extra careful when choosing course materials and give students the right amount of reading assignments; otherwise students can easily get lost or end up learning little.

I wrote this book with an ambition of narrowing the gaps between the textbooks currently available and what is ideal for students studying at Japanese universities. This

motivation lies behind the following features of this textbook.

First, although this book covers more or less the same topics as the standard textbooks on international economics, all chapters include some material related to Japan. Therefore, students can not only learn standard international economics in the context of the Japanese economy, but also use this textbook as an opportunity to study Japan through the lens of international economics.

Second, I made efforts to make this textbook as compact as possible. The main part of each chapter has only 6–8 pages, which I consider more or less the maximum that the average student can realistically be expected to read for each class. However, this book is *not* a collection of fragmentary lecture notes. While the treatment of each topic is by necessity rather selective, I tried to write each chapter in a way that students can read it on their own and gain a basic understanding of the concepts and theories covered in that chapter. Students who have read this textbook will have a firm grasp of what international economics is all about and how the subject can help them make sense of various issues facing the contemporary Japanese and international economies.

Third, as a book of this length, this textbook has an exceptionally large number of tables and figures. All of these tables and figures are created by the author and constitute an integral part of this book. They are intended to not only supplement verbal explanations but also push the reader to think about each topic and theory in terms of real-world statistics. Although some chapters contain a small number of equations, these equations are almost always accompanied by *both* textual *and* graphical expositions so as not to alienate students who are not accustomed to discussing social issues with mathematical expressions.

Lastly, each chapter has a set of questions of varying lengths. These questions are also an integral part of this textbook and are designed to encourage students to apply what they have learned in the main body of each chapter to more advanced materials or Japan-related issues. Since many of these questions are of the open-ended type, the instructor can use them as materials for homework and classroom discussion. Professors who use this textbook for their class can contact the publisher for lecture slides and supplementary materials on the end-of-the-chapter questions.

Although I made efforts to minimize factual and typological errors, the first edition of any book inevitably contains errors and inadequacies. Comments and suggestions are most welcome that will improve future editions of this textbook.

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Japan in the World Economy
An Introduction to International Economics

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Chapter 1

A Survey on the World Economy

Many people say that we are living in an age of globalization. Although “globalization” is a rather vague term that can represent a variety of phenomena, this textbook is primarily concerned about globalization in the economic sphere. **Economic globalization** refers to a process in which the economies of individual countries are increasingly tied together through such means as trade in goods and services, financial investment, and the cross-border movement of companies and people. In this opening chapter, we conduct a broad-brush survey on the contemporary world economy and compare Japan’s integration into the international economy with that of other countries.

A Globalizing World?

We first examine how far the world as a whole has become an integrated economy. Figure 1 presents time-series data on the values of global trade in goods and services, and that of foreign direct investment (FDI), measured as a proportion of the sum of the gross domestic product (GDP) of all countries in the world. FDI refers to firms’ purchase of overseas assets, such as land and company shares in foreign countries, with the aim of expanding their business to these countries. GDP is the net value of goods and services produced in each country during a specific period, such as one year. The total GDP of all countries represents the amount of global output during the corresponding period.¹

According to Figure 1.1, the ratios of global trade and FDI to GDP have increased markedly over the past three decades. This implies that international trade and FDI—two important channels of cross-border economic integration—have grown at a faster

¹ FDI will be examined in more detail in Chapter 7. The concept of GDP and its relationship with international trade will be discussed in Chapter 9 and Appendix B. Appendix A and B contain materials that will be useful throughout this textbook.

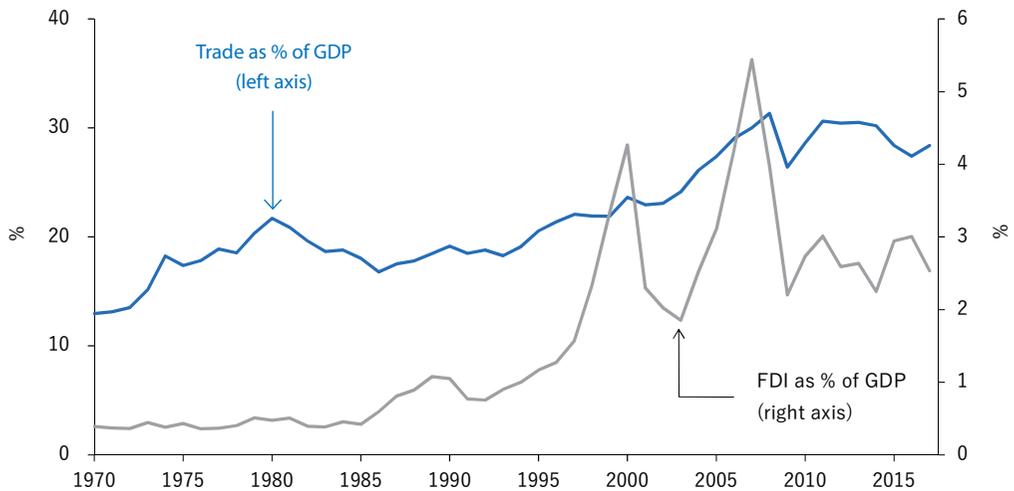


Figure 1.1 International trade and foreign direct investment as percentage of global gross domestic product

Sources: World Bank, *World Development Indicators*; United Nations Conference on Trade and Development, *UNCTADSTAT*.

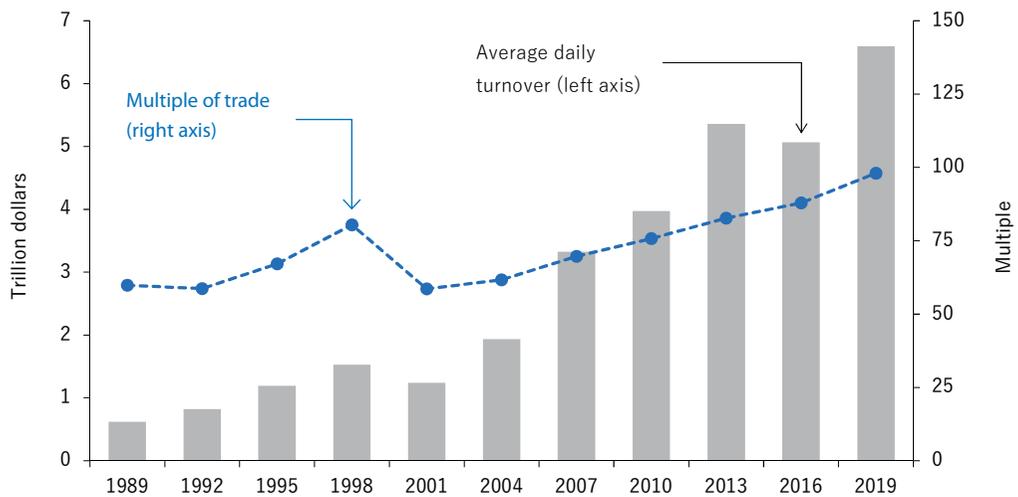


Figure 1.2 Turnover of foreign exchange markets in the world

Note: This figure updates Figure 1.3 in Reinert (2012). Underlying data are obtained from World Bank, *World Development Indicators* and the Bank for International Settlements, *Triennial Central Bank Survey of Foreign Exchange and Over-the-counter Derivatives Markets*.

pace than economic activities within individual countries. Nevertheless, the two graphs are not smooth and exhibit considerable short-term fluctuations. This reflects the fact that international economic activities are less stable than economic activities within individual countries.

Since most countries have their own currencies, international trade and investment are often accompanied by a purchase or sale of one country's currency against another. In developed countries, such foreign exchange transactions are largely free of government regulations and can be executed quickly through a network of commercial banks and other financial institutions. In Figure 1.2, the bar chart displays the amount of global foreign exchange transactions on a typical business day, whereas the line graph shows this value as a ratio to the corresponding value of global trade in goods and services.

According to Figure 1.2, global foreign exchange transactions have increased enormously over the past two decades, reaching in 2019 a staggering 6.6 trillion dollars *per day*. Today, the amount of global currency trade is nearly 100 times as large as the value of international trade in goods and services, suggesting that most of these foreign exchange transactions are conducted for purposes other than payments for goods and services. Foremost among these other purposes is cross-border financial investment, such as buying and selling of government bonds and company shares denominated in foreign currencies.²

From Figures 1.1 and 1.2, you might have an impression that economic globalization is an irreversible process that is progressing at a relentless pace. However, this impression is not entirely accurate. To understand why, let's look at Figure 1.3. This figure presents statistics on global population and the share of migrants in the world population. These data come from the United Nations and the World Bank, which define migrants very broadly as "people who were born in a county other than that in which they currently reside."³

Global population has more than doubled during the past half century, although the rate of growth has been declining in recent years. During the same period, the share of migrants in the world population has barely risen, remaining at a rather modest 3.3% as of 2015.⁴

Most countries are eager to increase exports and inbound tourists, but are wary of foreigners who come to their countries to seek a job and permanent residence. The contrast between the rapidly growing international trade and investment on the one hand, and the rather modest increase in international migration on the other, suggests

² The effect of international investment on exchange rates will be examined in Chapter 10.

³ International migration will be discussed in Chapter 8.

⁴ The increase in 1990 partially reflects the breakup of the former USSR and the subsequent reclassification of some residents as migrants.

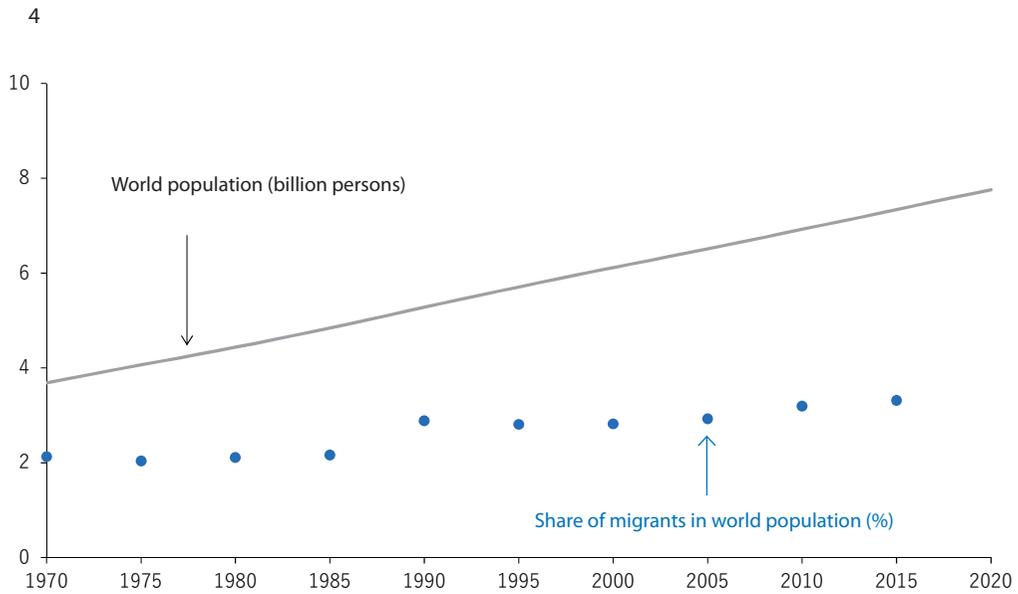


Figure 1.3 World population and migrant stock

Source: World Bank, *World Development Indicators*; United Nations Department of Economic and Social Affairs, *Global Population Prospects*.

that economic globalization is not necessarily an inevitable process but depends critically on policies of individual countries.

How about Japan?

Let us next examine how far Japan has integrated itself into the world economy. This book will frequently compare Japan with other members of the **Organization for Economic Co-operation and Development (OECD)**, a forum of 36 relatively advanced countries upholding democracy and the market economy. Since the economic and political circumstances of poor countries and authoritarian non-market economies are very different from those of affluent market democracies, it makes sense to focus on the OECD membership when comparing Japan with other countries.⁵

Table 1.1 presents data on three indicators of economic internationalization. These indicators are: (1) the total value of international trade in goods and services as a percentage of GDP; (2) the outstanding stock (i.e., the cumulative sum) of inward FDI, which means investment by foreign companies into the respective country, as a percentage of its GDP; and (3) the share of migrants in total population. For reference, the table also provides data on total population.

⁵ Chapter 13 touches upon the relationship between economic growth and political system.

Country	Trade (% of GDP)	Inward FDI stock (% of GDP)	Migrants (% of population)	Population (million)
Japan	35.6 (35)	4.0 (36)	1.6 (34)	127.1 (2)
USA	27.7 (36)	31.5 (27)	14.5 (12)	320.7 (1)
Average (36 countries)	105.1	65.0	12.6	35.6

Table 1.1 Economic globalization of OECD countries (2015)

Note: Numbers in parentheses indicate the rank among the 36 countries.

Sources: World Bank, *World Development Indicators*; Organization for Economic Co-operation and Development, *OECD.stat*.

Somewhat surprisingly, Japan is at or close to the bottom of the 36 countries in *all* three indicators. According to these indicators, the Japanese economy is far from globalized and appears rather isolated, at least in comparison to the other OECD countries.

However, how much a country's economy looks internationalized depends in part on the yardstick used. The three indicators in Table 1.1 are scaled as a proportion to GDP or population and tend to be smaller for relatively populous countries such as the United States and Japan. This is why the rank of the United States is also low for the trade- and FDI-GDP ratios, despite the fact that large American corporations are highly visible and trade extensively around the world. Although Japan's population is only 40% of that of the United States, it is the second most populous country among the OECD countries, some of which have a population less than one hundredth of that of Japan.

Nevertheless, Japan *does* have certain characteristics that can hinder the internationalization of its economy. For example, although Japan's population is relatively large, its people are ethnically rather homogeneous and share a language that is rarely spoken in other countries. In addition, Japan is an island nation whose territories are surrounded by the sea. Lack of daily exposure to foreigners and foreign cultures makes many Japanese people ill-prepared and reluctant to engage in cross-cultural communication. This *psychological* barriers to globalization in turn makes Japanese firms and people cautious about *economic* globalization, such as letting foreigners and foreign companies come to Japan to seek jobs and business opportunities.⁶

⁶ See the questions at the end of this chapter. Chapters 7 and 8 provide other evidence on social and economic barriers to Japan's internationalization.

Summary

Despite much fanfare about the “age of globalization,” the integration of the world economy is at best an ongoing process whose progress differs between areas of activity. Economic globalization has progressed impressively in such spheres as international trade and investment, but remains modest in other areas such as migration. Japan’s integration into the world economy is much less advanced than in other OECD countries, although its limited exposure to international economic transactions may be due in part to its geographical and historical circumstances.

Questions

1. Some people argue that the ongoing globalization of the world economy is no more than a temporary phenomenon. In their opinion, an increased exposure of a country to the international economy inevitably creates “winners” and “losers” within the country and causes a backlash against globalization. Do you agree to this view? Give your answer with an explanation of why you think so.
2. The **World Values Survey (WVS)** is a global network of social scientists studying citizens’ social and political values. The WVS conducts cross-national questionnaire surveys at regular intervals in order to compare the social and political inclinations of people in different countries. This survey includes the following question: “*On this list are various groups of people. Could you please mention any that you would not like to have as neighbors?*”

Figure 1.4 shows the responses to the above question from citizens in 15 OECD countries. The two panels in this figure report the proportions of respondents who identified “immigrants/foreign workers” and “people of a different religion” as undesirable neighbors. To examine the relationship between a country’s income level and the perception of its citizens about their neighbors, both panels plot GDP per capita on the horizontal axis.⁷

According to Figure 1.4, the proportion of respondents who are reluctant to live with foreigners and people of different religions is higher in Japan than in most other OECD countries. Is this due to xenophobia? Or is it because Japanese

⁷ GDP per capita is a country’s GDP divided by its population. GDP per capita is often used as an indicator of a country’s income level and standard of living. See Chapter 9 and Appendix B for further explanations.

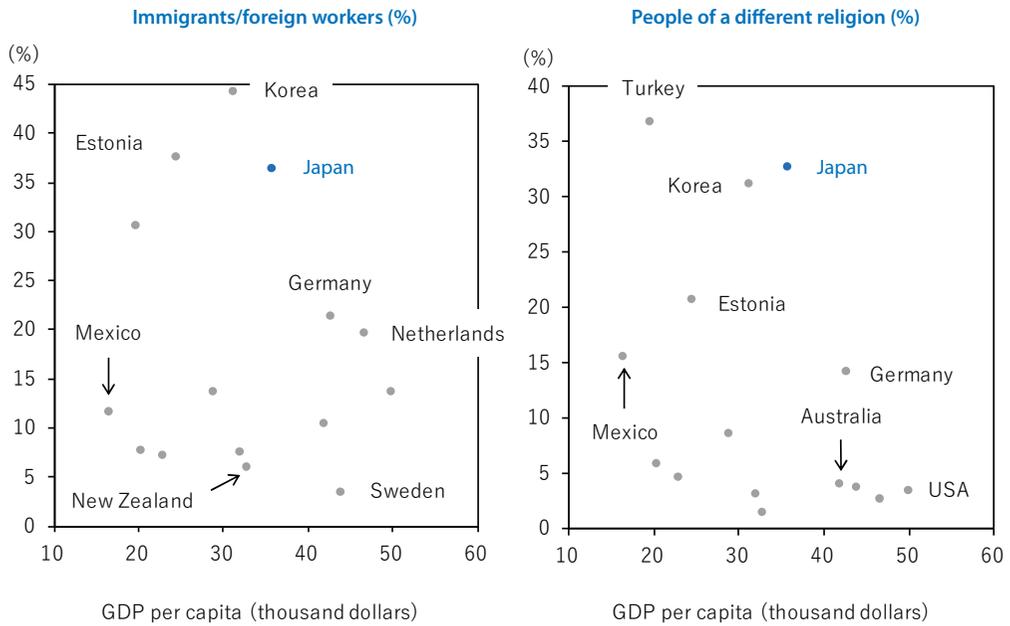


Figure 1.4 Who would you not like to have as neighbors?

Note: This figure draws on the result of the World Values Surveys conducted between 2010 and 2014. GDP per capita is evaluated in 2011 dollars using purchasing power parity (PPP) exchange rates. See Appendix B at the end of the book for the meaning of the PPP exchange rate.

Sources: World Values Survey Association, *World Values Survey Wave 6*; World Bank, *World Development Indicators*.

people are not yet used to living with people with different cultures and beliefs? Do you think that Japanese people's perception about foreigners is likely to change in the near future?

Chapter 2

Comparative Advantage and International Trade

Cross-border merchandise trade is perhaps the oldest and most powerful force that links national economies. Although some countries export only food and natural resources, other countries trade a variety of manufactured products with foreign countries. Thanks to international trade, we can enjoy a variety of goods produced in diverse places in the world.

However, international trade is not without its critics. For example, some people argue that uninhibited international trade exacerbates inter-/intra-national income disparities and environmental disruption. Therefore, we will devote this and the following four chapters on issues surrounding international trade in goods and services. In this chapter, we consider merits of international trade by referring to the concept of **comparative advantage**.

Comparative Advantage and Division of Labor

We first discuss the idea of comparative advantage in terms of a simple example. Let's consider two countries, Japan and the United States. Initially, these countries are in **autarky**, a situation in which each country is completely self-sufficient and does not engage in any economic transactions with other countries.

Both countries produce two goods: food and machinery. In Japan, it takes two workers to produce one unit of food and three workers to manufacture one unit of machinery. In the United States, producing one unit of food and producing one unit of machinery both require two workers. These assumptions are summarized in the top section of Table 2.1.

For simplicity, let's also assume that the price of each good is determined solely by labor cost. Then the **relative price** of the two goods—which we define as *the ratio of the price of one unit of food to that of one unit of machinery*—is $2/3$ in Japan and $2/2$

(a) Labor required for production of one unit of goods (persons)

	Japan	United States
Food	2	2
Machinery	3	2

(b) Output under autarky (units)

	Japan	United States	Total
Food	20	25	45
Machinery	20	25	45

(c) Output with division of labor (units)

	Japan	United States	Total
Food	50		50
Machinery		50	50

Table 2.1 Comparative advantage and gains from division of labor

Note: Shaded cells indicate the good in which each country possesses a comparative advantage.

(=1) in the United States. We can describe the relationship between the two countries' relative prices as follows:

$$\frac{2}{3} < \frac{2}{2}. \quad (2.1)$$

Equation (2.1) says that food is relatively cheap in Japan, which means that Japan is relatively good at producing food. By the same token, machinery is less expensive in the United States, suggesting that the country is relatively efficient in the production of machinery. When the two countries' relative prices satisfy these conditions, *Japan is said to have a comparative advantage in the production of food, whereas the United States is said to have a comparative advantage in the production of machinery*. Please note that we are *not* talking about which country can produce each good more cheaply than the other country. What we are discussing here is *the relative superiority of one country over the other country in the production of one good in relation to the other good*, so we are comparing the prices of the two goods in the two countries simultaneously.

Let us next suppose there are 100 workers in both Japan and the United States. If Japanese people wish to consume food and machinery by the same number of units, the output of each good is $100 \div (2 + 3) = 20$ units. Similarly, if American people want to purchase food and machinery by the same number of units, the output of each good is $100 \div (2 + 2) = 25$ units. These numbers are displayed in Table 2.1 (b). The total

output of each good in the two countries is $20 + 25 = 45$ units.

What will happen if the two countries terminate autarky and start trading with each other? Once international trade is permitted, these countries no longer need to produce everything they consume, nor do they have to consume everything they produce. As an example, let's suppose that each country only produces the good for which it has a comparative advantage. Then Japan can produce $100 \div 2 = 50$ units of food, and the United States can produce $100 \div 2 = 50$ units of machinery. These numbers are larger than the two countries' total output of each good under autarky, which was 45 units.

In the above example, there is little question that international trade is superior to autarky. However, it is important to note that the ultimate source of this superiority is not international trade but the **division of labor** between the two countries. More specifically, *in the above example, the two countries were able to increase their total output because international trade allowed them to specialize in the production of the good for which they have a comparative advantage.* Since specializing in the wrong good makes both countries worse off,¹ let us next consider whether the desirable division of labor will arise spontaneously when international trade is liberalized.

Comparative Advantage and Exchange Rates

Once international trade is liberalized, firms that offer the lowest price can sell in both the domestic and foreign markets. However, since Japanese goods are priced in yen and American goods are priced in dollars, we need to convert yen prices into dollar prices—or dollar prices into yen prices—to find out which ones are cheaper.

Let's assume that when Japan was in autarky, the prices of one unit of food and machinery were P_f yen and P_m yen, respectively. Similarly, we assume that when the United States was in autarky, the prices of one unit of food and machinery were P_f^* dollars and P_m^* dollars, respectively.

In this chapter, we define the **exchange rate** between the Japanese yen and the U.S. dollar as the price of one dollar in yen and let e denote this price. For example, when one dollar is traded for 100 yen on the foreign exchange market, $e = 100$. Then we can express the *yen prices* of the food and machinery produced *in the United States* as $e \times P_f^*$ and $e \times P_m^*$, respectively.

Whether a particular good is cheaper in Japan or in the United States depends on the value of the exchange rate. We let e_f denote *the exchange rate at which the price of food is equalized between the two countries.* Since

¹ You are encouraged to verify this statement by calculating how much each country can produce when it specializes in the good for which it lacks a comparative advantage.

$$P_f = e_f \times P_f^*, \quad (2.2)$$

it is easy to find that e_f takes the following value:

$$e_f = \frac{P_f}{P_f^*}. \quad (2.3)$$

When the actual exchange rate is large than e_f , food becomes cheaper in Japan and will be exported from Japan to the United States; when the exchange rate falls below e_f , food becomes cheaper in the United States and will be exported from the United States to Japan.

We let e_m denote the exchange rate at which the price of machinery is equalized between the two countries. By analogy, it should be easy to find that this exchange rate takes on the following value:

$$e_m = \frac{P_m}{P_m^*}. \quad (2.4)$$

Japan exports machinery when the actual exchange rate is larger than e_m ; the United States exports machinery when the exchange rate becomes smaller than e_m .

Now let's return to equation (2.1). In terms of the symbols introduced in this section, *the condition under which Japan possesses a comparative advantage in food* can be described more generally as

$$\frac{P_f}{P_m} < \frac{P_f^*}{P_m^*}. \quad (2.5)$$

This is also the condition under which the United States has a comparative advantage in machinery.

By multiplying both sides of equation (2.5) by P_m/P_f^* , we find the following inequality relation:

$$\frac{P_f}{P_f^*} < \frac{P_m}{P_m^*}. \quad (2.6)$$

In terms of the symbols introduced above, this relationship can be expressed more compactly as

$$e_f < e_m. \quad (2.7)$$

Figure 2.1 summarizes the relationship between the exchange rate and the structure of trade between the two countries. When the exchange rate is smaller than e_f , both goods are cheaper in the United States and exported from the United States to Japan.

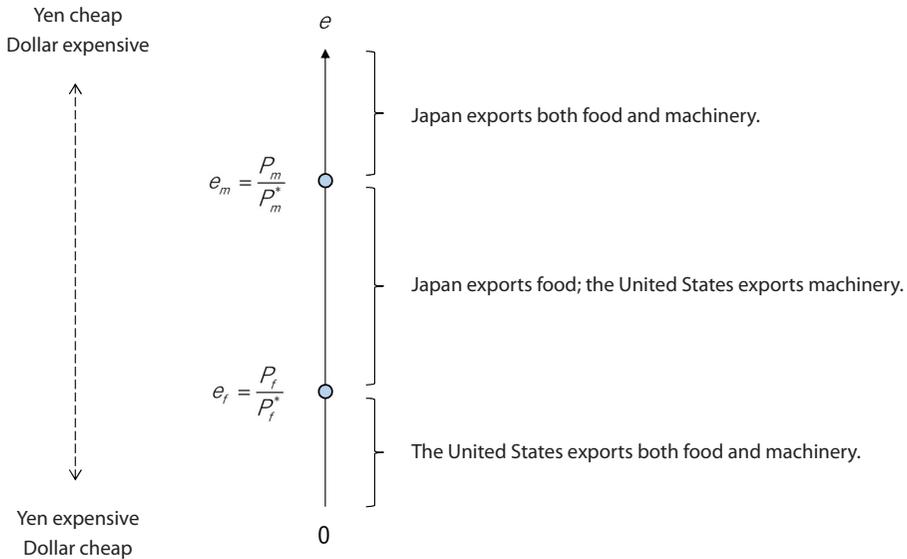


Figure 2.1 The relationship between exchange rates and the pattern of trade

When the exchange rate is larger than e_m , both goods are cheaper in Japan and exported from Japan to the United States. When the exchange rate is between e_f and e_m , food is exported by Japan, but machinery is exported by the United States.

What is clear in Figure 2.1 is that *whatever value the exchange rate takes, there is no circumstance under which Japan exports machinery and the United States exports food*. Therefore, we can be rest assured that the “wrong” specialization—in which each country exports a good for which it has no comparative advantage—will never arise even if there is no explicit coordination between the two countries.

A less straightforward question is whether there is any possibility that the exchange rate becomes either so small or so large that both food and machinery are exported from one country to the other. Although such a situation might arise from time to time, it is unlikely to continue for more than a brief period. The reason is as follows.

As an example, let’s suppose that e is so large (i.e., the yen is so cheap relative to the dollar) that both goods are exported from Japan to the United States. Then there should be a lot of demand for workers in Japan but little demand for workers in the United States. Then the wage rate will gradually increase in Japan but will stagnate or decline in the United States. As time passes, therefore, the prices will rise faster in Japan than in the United States, eventually reversing their relative magnitude.

Furthermore, there is a built-in force in international trade that nudges exchange rates to a value at which all countries can export at least some goods.² To see how this

² The following explanation presumes floating exchange rates—exchange rates that change flexibly in

happens, let us suppose again that e is now so large that Japan is exporting both food and machinery. Then Japanese firms earn a lot of dollars in payment for their exports but American firms earn no yen.³ Since Japanese firms ultimately need yen, these firms will try to exchange these dollars for yen. However, since American firms have no yen to sell, there will be an excess demand for yen and an excess supply of dollars in the foreign exchange market. Then the yen/dollar exchange rate—the price of a dollar in yen—will fall until American firms are able to start earning yen by exporting machinery to Japan.

As noted in Chapter 1, however, most of the foreign exchange transactions in the contemporary world are associated with international investment rather than trade in goods and services. Therefore, international capital flows may occasionally drive up or down exchange rates to a level at which a country's balance of trade—the difference between its export receipts and import payments—becomes seriously unbalanced.⁴

Conclusion

Despite lingering suspicions and critiques, international trade in goods and services is an important channel through which national economies interact with one another. Each country can enhance the lives of its citizens by specializing in the production of goods for which it has a comparative advantage and by importing other goods from foreign countries.

Since comparative advantage is a “relative-relative” concept involving a simultaneous comparison of goods *and* countries, all countries are guaranteed to have a comparative advantage in—and able to export—at least certain goods. Although a country's trade may occasionally become unbalanced, international trade has a built-in force for pushing the exchange rate in a direction that mitigates such imbalances.

response to changes in the demand and supply conditions in the foreign exchange market. Although many countries control the exchange rates of their currencies in one way or another, no country can maintain an exchange rate at which it can export all goods without importing anything from abroad; see Chapter 11.

³ If Japanese exporters insist on being paid in yen, American importers must obtain the necessary amount of yen by selling dollars before purchasing goods. Therefore, which currency is used for settlements of trade does not change the result of this paragraph.

⁴ However, a country's trade imbalance reflects not only a “wrong” exchange rate but also a variety of other factors; see Chapter 9.

Questions

The example in Table 2.1 was made deliberately simple in order to highlight the merit of international trade. In reality, most countries do not completely specialize in the production of comparative-advantage goods, but also produce at least some goods for which they are at a comparative *dis*advantage. Such a situation is called **incomplete specialization**.

Moreover, although each country in the previous example specialized in the production of a particular good, it can also specialize in a particular *stage* or *segment* of the process of producing a good. For example, it is possible that one country specializes in the production of a particular component of an automobile, and exports this component to another country where the final assembly operation is performed. In recent years, such **international production sharing** has become very popular due to trade liberalization and declining transport costs.⁵ Table 2.2 considers an example of international division of labor involving incomplete specialization and international production sharing.

Let us consider two countries, Cambodia and Japan. Both countries produce T-shirts, which involves a two-step process of manufacturing textiles and sewing these textiles into T-shirts. In autarky, each country must conduct both tasks and produce all T-shirts it consumes. When international trade is permitted, at least one country can specialize in a single task.

We assume that Cambodia needs five workers to produce one unit of textiles and three workers to manufacture these textiles into one T-shirt. Similarly, Japan needs two workers to produce a unit of textiles and another two workers to sew these textiles into a T-shirt. Although Japan can perform both tasks with less labor, it should be clear to you that *Japan has a comparative advantage in textile production while Cambodia has a comparative advantage in sewing*. This relationship is shown in Table 2.2 (a).

We assume that there are 120 workers in both Cambodia and Japan. Under autarky, Cambodia produces $120 \div (5 + 3) = 15$ T-shirts and Japan produces $120 \div (2 + 2) = 30$ T-shirts, so the total output of the two countries is $15 + 30 = 45$. These numbers are indicated in the rightmost column of Table 2.2 (b).

What will happen if the two countries terminate autarky and pursue the merits of division of labor? One complication in the present example is that the two countries' technological gap (reflected in their labor requirements) is so large that it is impossible for both countries to specialize in a single task. For example, if Japan specializes in textile manufacturing, it can produce $120 \div 2 = 60$ units. However, even if Cambodia

⁵ International production sharing is also known as **fragmentation**.

(a) Labor required for production of one unit of goods (persons)

	Cambodia	Japan
Textile manufacturing	5	2
Sewing	3	2

(b) Output under autarky (units)

	Cambodia	Japan	Total
Textile manufacturing	15	30	45
Sewing	15	30	45

(c) Output with division of labor (units)

	Cambodia	Japan	Total
Textile manufacturing			
Sewing	40		

Table 2.2 Comparative advantage and incomplete specialization

Note: Shaded cells indicate the task in which each country has a comparative advantage.

assigns all its workers to sewing, it can manufacture only $120 \div 3 = 40$ units of textiles into T-shirts. This implies that although Cambodia can completely specialize in sewing, Japan must continue both textile manufacturing and sewing.

Since Cambodia can sew up to 40 T-shirts, this number is entered in Table 2.2 (c). To manufacture the corresponding units of textiles, Japan needs $40 \times 2 = 80$ workers. Since the country still has some idle workers, it can produce more T-shirts.

1. Calculate how many more T-shirts Japan can produce, fill in relevant cells in Table 2.2 (c), and confirm that the total number of T-shirts produced is larger than the corresponding number under autarky.
2. Even if international division of labor increases the total output of the two countries, it is not clear how this fruit of cooperation is divided between these countries. Since both countries can always return to autarky if they are unsatisfied with what they receive, it is unlikely that the number of T-shirts each country receives will decline by engaging in international trade. Nevertheless, Cambodia now specializes in sewing and depends entirely on Japan for textiles, whereas Japan continues both textile manufacturing and sewing operations. This implies that Cambodia is in a weaker position when negotiating how to divide the output between the two countries. In reality, high-quality fiber production and the design of high-end

apparel are typically conducted in developed countries, whereas the majority of sewing operations are performed in developing countries. Needless to say, workers engaging in fiber production and apparel design receive much higher wages than do those engaged in sewing operations. If developing countries are not satisfied with this division of labor, should it return to autarky? Or should it do something else?

Chapter 3

Where Does Comparative Advantage Come From?

In Chapter 2, we learned that each country exports goods for which it has a comparative advantage and imports goods for which it is at a comparative disadvantage. However, what a country exports and imports change over time, suggesting that comparative advantage is not a fixed property. This begs an obvious question: *What determines each country's comparative advantage and disadvantage?* As you will see in this chapter, addressing this question will shed some new light on the meaning and benefits of international trade.

Who is competing with whom?

We first return to the example in Table 2.1, in which Japan and the United States produced food and machinery. In that example, the relationship between the countries' relative prices under autarky was

$$\frac{P_f}{P_m} < \frac{P_f^*}{P_m^*}. \quad (3.1)$$

When this relationship holds, Japan has a comparative advantage in the production of food while the United States has a comparative advantage in the production of machinery. As noted in Chapter 2, equation (3.1) is equivalent to

$$\frac{P_f^*}{P_f} < \frac{P_m}{P_m^*} \quad (3.2)$$

or

$$e_f < e_m \quad (3.3)$$

in which e_f and e_m represent the yen/dollar exchange rates at which the prices of food and machinery are equalized between the two countries.

In the real world, each country produces not just one or two goods but a large number of goods and services. To add a bit of realism to the above example, let us introduce a third good, which we call clothing. We assume that under autarky, the price of one piece of clothing is P_c yen in Japan and P_c^* dollars in the United States, and that the ratio of these prices satisfies the following relationship:

$$\frac{P_f}{P_f^*} < \frac{P_c}{P_c^*} < \frac{P_m}{P_m^*}. \quad (3.4)$$

If we let e_c denote the exchange rate at which the price of clothing is equalized between the two countries, we can rewrite equation (3.4) as

$$e_f < e_c < e_m. \quad (3.5)$$

From our discussion in Chapter 2, it should be clear to you that if the actual exchange rate e is smaller than e_f , all three goods are exported from the United States to Japan. Similarly, when e is larger than e_m , all goods are exported from Japan to the United States. However, as noted in Chapter 2, these situations are rather abnormal and unlikely to last for more than a brief period. Whenever e remains between e_f and e_m , Japan exports food and the United States exports machinery.

What about clothing? Clothing is cheaper in Japan when e is larger than e_c but is cheaper in the United States if e falls below e_c . Since each country exports at least one good as long as e remains between e_f and e_m , there is no reason to expect that e will always remain larger or smaller than e_c . It is more likely that the exchange rate fluctuates around this critical value, frequently changing the direction of clothing trade between the two countries.

Now suppose that you are the manager of a Japanese clothing company. According to the above analysis, your company is in a very precarious situation; you may be selling a lot of clothes in both Japan and the United States one day, but might lose all your customers to American firms on the following day. You are probably unhappy about this situation and want to do something about it.

But what can you do? The only thing you can do is to reduce the price of your clothes, either by developing new technology or by improving the efficiency of your manufacturing operations. If P_c falls sufficiently while all other prices in equation (3.4) remain the same, this equation will turn to

$$\frac{P_c}{P_c^*} < \frac{P_f}{P_f^*} < \frac{P_m}{P_m^*} \quad (3.6)$$

or

$$e_c < e_f < e_m. \quad (3.7)$$

In this case, your status as an exporter is assured except for the rather unlikely situation in which e falls below e_c .

Nevertheless, the above assumption of “all other prices remain the same” may not be very realistic, since *all* firms in *all* countries are *always* trying to improve their productivity and price competitiveness. Let us suppose that by the time you have managed to reduce P_c , Japanese food producers and machinery firms have succeeded in reducing P_f and P_m by even larger proportions. Then equation (3.4) does not turn to (3.6) but may instead switch to

$$\frac{P_f}{P_f^*} < \frac{P_m}{P_m^*} < \frac{P_c}{P_c^*} \quad (3.8)$$

or

$$e_f < e_m < e_c. \quad (3.9)$$

In this case, not only will you be unable to export your clothes, but you will also lose your Japanese customers to American clothing firms. Note that *this situation can arise even when your productivity is rising faster than that of American clothing companies.*

When the managers of companies talk about “global competition,” these managers typically have in mind competition with foreign firms in the same industry. However, the above analysis suggests that competition within the same industry is only part of what determines their fortunes in the world market; *once international trade has been liberalized, each firm effectively faces competition from all firms in all industries in both domestic and foreign markets.* In the next section, you will find that this insight is useful in understanding why goods that a country exports and imports tend to change in a similar fashion in the course of economic development.

Comparative Advantage and Factors of Production

In Chapter 2, we assumed for the sake of simplicity that the price of a good was determined solely by labor costs. However, the actual prices of goods reflect not only wages, but also the costs of raw materials, intermediate inputs and other resources. In economics, *resources that are used for the production of a good or service, but do not physically become part of the final product*, are called **factors of production**. Examples of

Country/good	Land, unskilled labor	Capital, skilled labor
Developing countries	△○	×
Developed countries	×△	○
Agriculture/food products	○	×
Light manufactures	△	△
Heavy/high-tech manufactures	×	○

Table 3.1 Factors of production in countries and industries

Note: ○ indicates the most abundant or intensively used factors of production. × represents the least abundant or intensively used production factors. △ indicates intermediate cases.

factors of production are land, capital (machinery, equipment and buildings) and labor (workers). Labor may be further divided into unskilled and skilled labor, of which the latter embodies specific skills and knowledge that are useful for certain advanced tasks.

Factors of production have two important properties that are relevant to our discussion of comparative advantage. First, in each country, the stocks (i.e., amounts) of some production factors are either fixed or changes only slowly over time, whereas some other production factors can be augmented fairly quickly through investment. Land and unskilled labor are examples of the former type, while capital and skilled labor are clearly of the latter type. Since the stocks of capital and skilled labor increase in the process of economic development, the stocks of capital and skilled labor *relative to* those of land and unskilled labor tend to be much larger in developed countries than in developing countries.

The other important property of production factors is that individual industries make use of these factors in diverse proportions. For example, agriculture is *land-intensive* in the sense that it requires proportionately more land than in other industries. Similarly, light manufacturing such as food processing and the sewing of clothes is relatively intensive in unskilled (or semi-skilled) labor, whereas the production of machinery and pharmaceuticals are more intensive in capital and high-skilled labor.

Table 3.1 summarizes the availability and requirement of the two types of production factors in representative countries and industries. According to this table, the resource endowment of developing countries is unsuited to the production of heavy and high-tech manufactures, whereas that of developed countries is not suitable for food production and light manufacturing. Even when developing countries are technically capable of producing heavy and high-tech manufactures, the scarcity of capital and high-skilled labor will drive up the prices of these goods. In developed countries, the production of food and light manufactures is likely to prove very expensive due to the relative scarcity of land and un-/semi-skilled labor.¹

¹ Although some developed countries have vast arable land, the stock of land *relative to capital and*

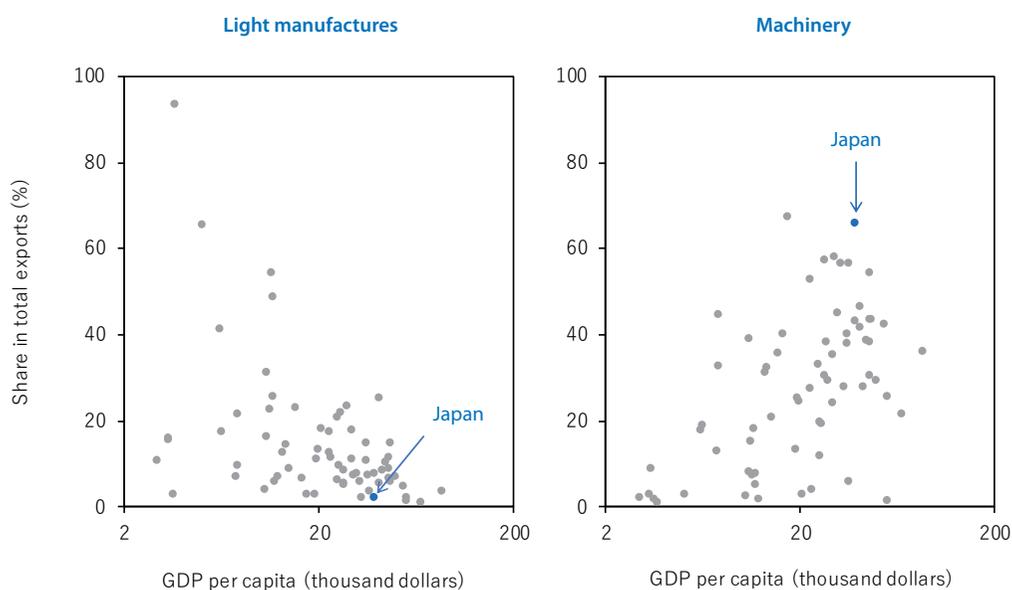


Figure 3.1 Income level and the composition of exports (2015)

Notes: Export shares are calculated by excluding energy and mineral resources. Machinery excludes telecommunication products because these goods are typically assembled in low- and middle-income countries using capital- and technology-intensive intermediate components imported from high-income countries. GDP per capita is adjusted for international price disparities and expressed in 2011 PPP dollars.

Source: CEPII/Bureau van-Dijk, *Chelem Database*.

To the extent that this is the case, it seems natural that poor countries have a comparative advantage in food and light manufactures, while rich countries possess a comparative advantage in heavy and high-tech manufactures. We would also expect that a country's comparative advantage shifts from food and light manufactures to heavy and high-tech manufactures in the process of economic development.

The importance of production factors as a determinant of a country's comparative advantage is illustrated in Figure 3.1. This figure plots data on a large number of countries concerning the income level (as measured by GDP per capita) and the shares of light manufactures and machinery in total exports. The share of light manufactures is very large in some low-income countries but invariably low in high-income countries. In contrast, the share of machinery is lower in low-income countries than in middle- and high-income countries.

The concept of production factors is not only useful for understanding how each country's comparative advantage is determined, but also for shedding new light on the meaning of international trade. In Chapter 2, we discussed the merit of international

skilled labor will decline in all countries in the process of economic development.

trade solely in terms of the division of labor between countries. However, international trade can also be regarded as *a process through which international disparities in the stock of production factors are adjusted*.

To understand what the above sentence means, let's consider a hypothetical example in which Bangladesh and Japan trade T-shirts and automobiles. As a developing country, Bangladesh is relatively abundant in un-/semi-skilled labor and possesses a comparative advantage in the production of T-shirts. As a developed economy, Japan is relatively abundant in capital and high-skilled labor and has a comparative advantage in the production of automobiles. Therefore, once international trade is liberalized, Bangladesh exports T-shirts and Japan exports automobiles.

Although the trade between the two countries is superficially an exchange of *goods*, it can also be regarded as an exchange of *production factors*. Since the production of T-shirts is relatively intensive in un-/semi-skilled labor and that of automobiles is intensive in capital and high-skilled labor, by exporting T-shirts and importing automobiles, Bangladesh is effectively exporting un-/semi-skilled labor and importing capital and high-skilled labor. Similarly, by exporting automobiles and importing T-shirts, Japan is in effect exporting capital and high-skilled labor and importing un-/semi-skilled labor. This "trade" in production factors mitigates disparities between the two countries' *effective* stocks of production factors and allows people in both countries to consume the two goods in more balanced proportions than would be possible under autarky.

In general, exchanging production factors through international trade is more versatile and less stressful than a direct exchange of production factors. In the above example, Japan can augment its un-/semi-skilled labor not only by importing T-shirts, but also by inviting a large number of guest workers from Bangladesh. Although many developed countries do have such temporary guest worker programs, these programs often generate serious social tensions in both source and destination countries.²

Before closing this chapter, we note that international disparities in the endowment of production factors are not the only determinant of a country's comparative advantage. It is self-evident that technology matters for individual firms' export performance, and this is why some light-manufacturing firms are thriving even in high-income countries. However, what we have discussed in this chapter suggests that these firms are effectively sailing against the wind and will face increasingly stiff competition from firms in low-income countries.

In fact, high-income countries often lose a comparative advantage not only in food and light manufactures, but also in relatively advanced manufactures such as machinery. In Figure 3.1, the share of machinery in total exports is highest in middle-income countries rather than in high-income countries. This is because the manufacturing of

² We will discuss international migration in Chapter 8.