CHAPTER 1

INTRODUCTION

Introduction
The study of international economics has never been as important as it is now. At the beginning of the 21st century, nations are more closely linked through trade in goods and services, through flows of money, and through investment in each others’ economies than ever before. Figure 1-1 shows that international trade for the United States has roughly tripled in importance compared with the U.S. economy as a whole.

Figure 1-1: Exports and Imports as a Percentage of U.S. National Income

![Graph showing exports and imports as a percentage of U.S. national income](image)

What is International Economics About?
International economics deals with economic interactions that occur between independent nations. The role of governments in regulating international trade and investment is substantial. Analytically, international markets allow governments to discriminate against a subgroup of companies. Governments also control the supply of currency. There are several issues that recur throughout the study of international economics.

The Gains from Trade
Many people are skeptical about importing goods that a country could produce for itself. When countries sell goods to one another, all countries benefit.

Trade and income distribution
–International trade might hurt some groups within nations.
–Trade, technology, and wages of high and low-skilled workers.

The Pattern of Trade (who sells what to whom?)
Climate and resources determine the trade pattern of several goods. In manufacturing and services the pattern of trade is more subtle.

There are two types of trade:
–Interindustry trade depends on differences across countries.
–Intraindustry trade depends on market size and occurs among similar countries.

How Much Trade?
Many governments are trying to shield certain industries from international competition. This has created the debate dealing with the costs and benefits of protection relative to free trade.

–Advanced countries’ policies engage in industrial targeting.
–Developing countries’ policies promote industrialization:
  –Import substitution versus export promotion industrialization.

The Balance of Payments
Some countries run large trade surpluses. For example, in 1998 both China and South Korea ran trade surpluses of about $40 billion each. Is it good to run a trade surplus and bad to run a trade deficit?

Exchange Rate Determination
The role of changing exchange rates is at the center of international economics.

International Policy Coordination
A fundamental problem in international economics is how to produce an acceptable degree of harmony among the international trade and monetary policies of different countries without a world government that tells countries what to do.

The International Capital Market
There are risks associated with international capital markets:

–Currency depreciation
–National default

International Economics: Trade and Money
International trade analysis focuses primarily on the real transactions in the international economy. These transactions involve a physical movement of goods or a tangible commitment of economic resources. Example: The conflict between the United States and Europe over Europe’s subsidized exports of agricultural products

International monetary analysis focuses on the monetary side of the international economy. That is, financial transactions such as foreign purchases of U.S. dollars. Example: The dispute over whether the foreign exchange value of the dollar should be allowed to float freely or be stabilized by government action

International trade issues
Part I: International Trade Theory
Part II: International Trade Policy

International monetary issues
Part III: Exchange Rates and Open-Economy Macroeconomics
Part IV: International Macroeconomic Policy

CHAPTER 2

LABOR PRODUCTIVITY AND COMPARATIVE ADVANTAGE

Countries engage in international trade for two basic reasons:
1. They are different from each other in terms of climate, land, capital, labor, and technology.
2. They try to achieve scale economies in production.

The Ricardian model is based on technological differences across countries. These technological differences are reflected in differences in the productivity of labor.

The Concept of Comparative Advantage
On Valentine’s Day the U.S. demand for roses is about 10 million roses. Growing roses in the U.S. in the winter is difficult. Heated greenhouses should be used. The costs for energy, capital, and labor are substantial.
Resources for the production of roses could be used to produce other goods, say computers.

**Opportunity Cost**

The opportunity cost of roses in terms of computers is the number of computers that could be produced with the same resources as a given number of roses.

**Comparative Advantage**

A country has a comparative advantage in producing a good if the opportunity cost of producing that good in terms of other goods is lower in that country than it is in other countries.

Suppose that in the U.S. 10 million roses can be produced with the same resources as 100,000 computers. Suppose also that in Mexico 10 million roses can be produced with the same resources as 30,000 computers. This example assumes that Mexican workers are less productive than U.S. workers.

If each country specializes in the production of the good with lower opportunity costs, trade can be beneficial for both countries.

- Roses have lower opportunity costs in Mexico.
- Computers have lower opportunity costs in the U.S.

The benefits from trade can be seen by considering the changes in production of roses and computers in both countries.

### Table 2-1: Hypothetical Changes in Production

<table>
<thead>
<tr>
<th>Million Roses</th>
<th>Thousand Computers</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>−10</td>
</tr>
<tr>
<td>South America</td>
<td>+10</td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>+100</td>
</tr>
<tr>
<td></td>
<td>−30</td>
</tr>
<tr>
<td></td>
<td>+70</td>
</tr>
</tbody>
</table>

The example in Table 2-1 illustrates the principle of comparative advantage: If each country exports the goods in which it has comparative advantage (lower opportunity costs), then all countries can in principle gain from trade.

**What determines comparative advantage?**

Answering this question would help us understand how country differences determine the pattern of trade (which goods a country exports).

### A One-Factor Economy

Assume that we are dealing with an economy (which we call Home). In this economy:

- Labor is the only factor of production.
- Only two goods (say wine and cheese) are produced.
- The supply of labor is fixed in each country.
- The productivity of labor in each good is fixed.
- Perfect competition prevails in all markets.

The constant labor productivity is modeled with the specification of unit labor requirements: The unit labor requirements are the number of hours of labor required to produce one unit of output:

- Denote with $a_{LC}$ the unit labor requirement for cheese (e.g. if $a_{LC}= 2$, then one needs 2 hours of labor to produce one gallon of cheese).
- Denote with $a_{LW}$ the unit labor requirement for wine (e.g. if $a_{LW}= 2$, then one needs 2 hours of labor to produce one gallon of wine).

The economy’s total resources are defined as $L$, the total labor supply (e.g. if $L= 120$, then this economy is endowed with 120 hours of labor or 120 workers).

### Production Possibilities

The production possibility frontier (PPF) of an economy shows the maximum amount of a good (say wine) that can be produced for any given amount of another (say cheese), and vice versa. The PPF of our economy is given by the following equation:

$$a_{LC}Q_C + a_{LW}Q_W = L \quad (2-1)$$

From our previous example, we get:

$$Q_C + 2Q_W = 120$$

**Trade in a One-Factor World**

Assumptions of the model:

There are two countries in the world (Home and Foreign).

- Each of the two countries produces two goods (say wine and cheese).
- Labor is the only factor of production.
- The supply of labor is fixed in each country.
- The productivity of labor in each good is fixed.
- Labor is not mobile across the two countries.
- Perfect competition prevails in all markets.
- All variables with an asterisk refer to the Foreign country.

### Absolute Advantage

A country has an absolute advantage in a production of a good if it has a lower unit labor requirement than the foreign country in this good.

Assume that $a_{LC} > a_{LC}^* c$ and $a_{LW} > a_{LW}^*$

- This assumption implies that Home has an absolute advantage in the production of both goods. Another way to see this is to notice that Home is more productive in the production of both goods than Foreign.
- Even if Home has an absolute advantage in both goods, beneficial trade is possible.

The pattern of trade will be determined by the concept of comparative advantage.

### Comparative Advantage

Assume that $a_{LC}/a_{LW} > a_{LC}^*/a_{LW}^*$

- This assumption implies that the opportunity cost of cheese in terms of wine is lower in Home than it is in Foreign.
- In other words, in the absence of trade, the relative price of cheese at Home is lower than the relative price of cheese in Foreign.

Home has a comparative advantage in cheese and will export it to Foreign in exchange for wine.
Figure 2-2: Foreign’s Production Possibility Frontier

Figure 2-3: World Relative Supply and Demand

Determining the Relative Price Ather Trade
What determines the relative price (e.g., PC/ PW) ather trade? To answer this question we have to define the relative supply and relative demand for cheese in the world as a whole:

- The relative supply of cheese equals the total quantity of cheese supplied by both countries at each given relative price divided by the total quantity of wine supplied, \( (Q_C + Q^*C)/(Q_W + Q^*W) \).
- The relative demand of cheese in the world is a similar concept.

Figure 2-4: Trade Expands Consumption Possibilities

The Gains from Trade
If countries specialize according to their comparative advantage, they all gain from this specialization and trade. We will demonstrate these gains from trade in two ways. First, we can think of trade as a new way of producing goods and services (that is, a new technology).

Another way to see the gains from trade is to consider how trade affects the consumption in each of the two countries. The consumption possibility frontier states the maximum amount of consumption of a good a country can obtain for any given amount of the other commodity. In the absence of trade, the consumption possibility curve is the same as the production possibility curve. Trade enlarges the consumption possibility for each of the two countries.

A Numerical Example
The following table describes the technology of the two counties:

<table>
<thead>
<tr>
<th>Country</th>
<th>Cheese Production Rate</th>
<th>Wine Production Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home</td>
<td>( a_{LC} = 1 ) hour per pound</td>
<td>( a_{LC} = 2 ) hours per gallon</td>
</tr>
<tr>
<td>Foreign</td>
<td>( 2 ) hours per pound</td>
<td>( a_{LC} = 3 ) hours per gallon</td>
</tr>
</tbody>
</table>

The previous numerical example implies that:

\[
\frac{a_{LC}}{a_{LP}} = \frac{1}{2} < \frac{a^*_{LC}}{a^*_{LP}} = 2
\]

In world equilibrium, the relative price of cheese must lie between these values. Assume that \( PC/PW = 1 \) gallon of wine per pound of cheese. Both countries will specialize and gain from this specialization. Consider Home, which can transform wine to cheese by either producing it internally or by producing cheese and then trading the cheese for wine.

Home can use one hour of labor to produce \( 1/2 \) gallon of wine if it does not trade. Alternatively, it can use one hour of labor to produce \( 1/3 \) pound of cheese, sell this amount to Foreign, and obtain 1 gallon of wine. In the absence of trade, Foreign can use one unit of labor to produce \( 1/6 \) pound of cheese using the domestic technology. Can it do better by specializing in wine and trading wine with Home for cheese? In the presence of trade, Foreign can use one unit of labor to produce \( 1/3 \) gallon of wine. Since the world price of wine is \( PW/PC = 1 \) pound of cheese per gallon, Foreign can obtain \( 1/3 \) lb of cheese which is more than \( 1/6 \) lb.

A country with absolute advantage in both goods will enjoy a higher wage ather trade.

This can be illustrated with the help of a numerical example:

- Assume that \( PC = 12 \) and that \( PW = 12 \). Therefore, we have \( PC/PW = 1 \) as in our previous example.
- Since Home specializes in cheese ather trade, its wage will be \( (1/a_{LC})PC = (1/2) \cdot 12 = 6 \).
- Since Foreign specializes in wine ather trade, its wage will be \( (1/a_{LP}) PW = (1/3) \cdot 12 = 4 \).
- Therefore the relative wage of Home will be \( 6/4 = 1.5 \).
- Thus, the country with the higher absolute advantage will enjoy a higher wage ather trade.

Misconceptions About Comparative Advantage

Productivity and Competitiveness
Myth 1: Free trade is beneficial only if a country is strong enough to withstand foreign competition. –This argument fails to recognize that trade is based on comparative not absolute advantage.

The Pauper Labor Argument
Myth 2: Foreign competition is unfair and hurts other countries when it is based on low wages. Again in our example Foreign has lower wages but still benefits from trade.

Exploitation
Myth 3: Trade makes the workers worse off in countries with lower wages. In the absence of trade these workers would be worse off. Denying the opportunity to export is to condemn poor people to continue to be poor.

Comparative Advantage with Many Goods

Setting Up the Model
Both countries consume and are able to produce a large number, \( N \), of different goods.

Relative Wages and Specialization
The pattern of trade will depend on the ratio of Home to Foreign wages. Goods will always be produced where it is cheapest to make them. For example, it will be cheaper to produce good \( i \) in Home if \( w^i_{aLi} < w^*_{aLi} \), or by rearranging if \( a*_{Li}/a_{Li} > w/w^* \).
country will export that commodity in which it has comparative (as opposed to absolute) labor productivity advantage.

The fact that trade benefits a country can be shown in either of two ways:
1. We can think of trade as an indirect method of production.
2. We can show that trade enlarges a country’s consumption possibilities.

The distribution of the gains from trade depends on the relative prices of the goods countries produce. Extending the one-factor, two-good model to a world of many commodities makes it possible to illustrate that transportation costs can give rise to the existence of nontraded goods.

The basic prediction of the Ricardian model—that countries will tend to export goods in which they have relatively high productivity—has been confirmed by a number of studies.

### CHAPTER 3

**SPECIFIC FACTOR AND INCOME DISTRIBUTION**

Trade has substantial effects on the income distribution within each trading nation. There are two main reasons why international trade has strong effects on the distribution of income:
1. Resources cannot move immediately or costlessly from one industry to another.
2. Industries differ in the factors of production they demand.

The specific factors model allows trade to affect income distribution.

#### The Specific Factors Model

**Assumptions of the Model**

Assume that we are dealing with one economy that can produce two goods, manufactures and food. There are three factors of production: labor (L), capital (K) and land (F). Manufactures are produced using capital and labor (but not land). Food is produced using land and labor (but not capital). Labor is therefore a mobile factor that can be used in either sector. Land and capital are both specific factors that can be used only in the production of one good. Perfect Competition prevails in all markets.

How much of each good does the economy produce?

The economy’s output of manufactures depends on how much capital and labor are used in that sector. This relationship is summarized by a production function. The production function for good X gives the maximum quantities of good X that a firm can produce with various amounts of factor inputs. For instance, the production function for manufactures (food) tells us the quantity of manufactures (food) that can be produced given any input of labor and capital (land).

The production function for manufactures is given by

$$ Q_M = Q_M(K, L_M) $$

where:
- $Q_M$ is the economy’s output of manufactures
- $K$ is the economy’s capital stock
- $L_M$ is the labor force employed in manufactures

The production function for food is given by

$$ Q_F = Q_F(T, L_F) $$

where:
- $Q_F$ is the economy’s output of food
- $T$ is the economy’s supply of land
- $L_F$ is the labor force employed in food

The full employment of labor condition requires that the economy-wide supply of labor must equal the amount employed in food plus the labor employed in manufactures:

$$ L_M + L_F = L $$

We can use these equations and derive the production possibilities frontier of the economy.

#### Production Possibilities

To analyze the economy’s production possibilities, we need only to ask how the economy’s mix of output changes as labor is shifted from one sector to the other. Figure 3-1 illustrates the production function for manufactures.

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The shape of the production function reflects the law of diminishing marginal returns. Adding one worker to the production process (without increasing the amount of capital) means that each worker has less capital to work with. Therefore, each additional unit of labor will add less to the production of output than the last. Figure 3-2 shows the marginal product of labor, which is the increase in output that corresponds to an extra unit of labor.

Figure 3-2: The Marginal Product of Labor

Prices, Wages, and Labor Allocation

How much labor will be employed in each sector? To answer the above question we need to look at supply and demand in the labor market.

Demand for labor:
In each sector, profit-maximizing employers will demand labor up to the point where the value produced by an additional person-hour equals the cost of employing that hour.

The demand curve for labor in the manufacturing sector can be written:

\[ MPL_M \times P_M = w \]  

The wage equals the value of the marginal product of labor in manufacturing. The demand curve for labor in the food sector can be written:

\[ MPL_F \times P_F = w \]  

The wage equals the value of the marginal product of labor in food.

The wage rate must be the same in both sectors, because of the assumption that labor is freely mobile between sectors. The wage rate is determined by the requirement that total labor demand equal total labor supply:

\[ L_M + L_F = L \]  

At the production point the production possibility frontier must be tangent to a line whose slope is minus the price of manufactures divided by that of food. Relationship between relative prices and output:

\[ -MPL_F/MPL_M = P_M/P_F \]  

What happens to the allocation of labor and the distribution of income when the prices of food and manufactures change?

Two cases:
– An equal proportional change in prices
– A change in relative prices

When both prices change in the same proportion, no real changes occur. The wage rate \( w \) rises in the same proportion as the prices, so real wages (i.e. the ratios of the wage rate to the prices of goods) are unaffected. – The real incomes of capital owners and landowners also remain the same.
When only PM rises, labor shifts from the food sector to the manufacturing sector and the output of manufactures rises while that of food falls. The wage rate (w) does not rise as much as PM since manufacturing employment increases and thus the marginal product of labor in that sector falls.

Figure 3-7: A Rise in the Price of Manufactures

Figure 3-8: The Response of Output to a Change in the Relative Price of Manufactures

Figure 3-9: Determination of Relative Prices

Relative Prices and the Distribution of Income
Suppose that PM increases by 10%. Then, we would expect the wage to rise by less than 10%, say by 5%. What is the economic effect of this price increase on the incomes of the following three groups?

Workers:
We cannot say whether workers are better or worse off; this depends on the relative importance of manufactures and food in workers’ consumption.

Owners of capital:
They are definitely better off.

Landowners:
They are definitely worse off.

International Trade in the Specific Factors Model
Assumptions of the model
Assume that both countries (Japan and America) have the same relative demand curve. Therefore, the only source of international trade is the differences in relative supply. The relative supply might differ because the countries could differ in:
– Technology
– Factors of production (capital, land, labor)

Resources and Relative Supply
What are the effects of an increase in the supply of capital stock on the outputs of manufactures and food? A country with a lot of capital and not much land will tend to produce a high ratio of manufactures to food at any given prices.

Figure 3-10: Changing the Capital Stock

An increase in the supply of capital would shift the relative supply curve to the right. An increase in the supply of land would shift the relative supply curve to the left. What about the effect of an increase in the labor force? The effect on relative output is ambiguous, although both outputs increase.

Trade and Relative Prices
Suppose that Japan has more capital per worker than America, while America has more land per worker than Japan. As a result, the pretrade relative price of manufactures in Japan is lower than the pretrade relative price in America. International trade leads to a convergence of relative prices.

Figure 3-11: Trade and Relative Prices

The Pattern of Trade
In a country that cannot trade, the output of a good must equal its consumption. International trade makes it possible for the mix of manufactures and food consumed to differ from the mix produced. A country cannot spend more than it earns.

Figure 3-12: The Budget Constraint for a Trading Economy Q1M
To assess the effects of trade on particular groups, the key point is that international trade shifts the relative price of manufactures and food. Trade benefits the factor that is specific to the export sector of each country, but hurts the factor that is specific to the import-competing sectors. Trade has ambiguous effects on mobile factors. Could those who gain from trade compensate those who lose, and still be better off themselves? If so, then trade is potentially a source of gain to everyone. The fundamental reason why trade potentially benefits a country is that it expands the economy’s choices. This expansion of choice means that it is always possible to redistribute income in such a way that everyone gains from trade.

The Political Economy of Trade: A Preliminary View
Trade often produces losers as well as winners.

Optimal Trade Policy
The government must somehow weigh one person’s gain against another person’s loss. Some groups need special treatment because they are already relatively poor (e.g., shoe and garment workers in the United States). Most economists remain strongly in favor of more or less free trade. Any realistic understanding of how trade policy is determined must look at the actual motivations of policy.

Income Distribution and Trade Politics
Those who gain from trade are a much less concentrated, informed, and organized group than those who lose. Example: Consumers and producers in the U.S. sugar industry

Summary
International trade often has strong effects on the distribution of income within countries, so that it often produces losers as well as winners. Income distribution effects arise for two reasons:
1. Factors of production cannot move instantaneously and costlessly from one industry to another.
2. Changes in an economy’s output mix have differential effects on the demand for different factors of production.

A useful model of income distribution effects of international trade is the specific-factors model. In this model, differences in resources can cause countries to have different relative supply curves, and thus cause international trade. In the specific factors model, factors specific to export sectors in each country gain from trade, while factors specific to import-competing sectors lose. Mobile factors that can work in either sector may either gain or lose. Trade nonetheless produces overall gains in the sense that those who gain could in principle compensate those who lose while still remaining better off than before.
CHAPTER 4
RESOURCES AND TRADE: THE HECKSCHER OHLIN MODEL

In the real world, while trade is partly explained by differences in labor productivity, it also reflects differences in countries’ resources.

The Heckscher-Ohlin theory:
Emphasizes resource differences as the only source of trade
Shows that comparative advantage is influenced by:
– Relative factor abundance (refers to countries)
– Relative factor intensity (refers to goods)

Is also referred to as the factor-proportions theory

A Model of a Two-Factor Economy
Assumptions of the Model
An economy can produce two goods, cloth and food. The production of these goods requires two inputs that are in limited supply: labor (L) and land (T). Production of food is labor-intensive and production of cloth is land-intensive in both countries. Perfect competition prevails in all markets.

Figure 4-1: Input Possibilities in Food Production

Unit land input a_L, in acres per calorie

Input combinations that produce one calorie of food

Unit land input a_T, in hours per calorie

Factor Intensity
In a world of two goods (cloth and food) and two factors (labor and land), food production is land-intensive, if at any given wage-rental ratio the land-labor ratio used in the production of food is greater than that used in the production of cloth:

\[ \frac{T_F}{L_F} > \frac{T_C}{L_C} \]

Example: If food production uses 80 workers and 200 acres, while cloth production uses 20 workers and 20 acres, then food production is land-intensive and cloth production is labor-intensive.

Figure 4-2: Factor Prices and Input Choices
Wage-rental ratio, w/r

Factor Prices and Goods Prices
Stolper-Samuelson Theorem (effect):
If the relative price of a good increases, holding factor supplies constant, then the nominal and real return (in terms of both goods) to the factor used intensively in the production of that good increases, while the nominal and real return (in terms of both goods) to the other factor decreases. The reverse is also true.

Resources and Output
How is the allocation of resources determined? Given the relative price of cloth and the supplies of land and labor, it is possible to determine how much of each resource the economy devotes to the production of each good.

Figure 4-5: The Allocation of Resources

An increase in the price of cloth relative to that of food, PC/PF, will:
– Raise the income of workers relative to that of landowners, w/r.
– Raise the ratio of land to labor, T/L, in both cloth and food production and thus raise the marginal product of labor in terms of both goods.
– Raise the purchasing power of workers and lower the purchasing power of landowners, by raising real wages and lowering real rents in terms of both goods.

Rybczynski Theorem (effect):
If a factor of production (T or L) increases, then the supply of the good that uses this factor intensively increases and the supply of the other good decreases for any given commodity prices. The reverse is also true.

Figure 4-6: An Increase in the Supply of Land

Resources and Production Possibilities
Effects of International Trade Between Two-Factor Economies

Assumptions of the Heckscher-Ohlin model:
There are two countries (Home and Foreign) that have:
– Same technology
– Same tastes

Different resources, Home has a higher ratio of labor to land than Foreign does. Each country has the same production structure of a two-factor economy.

Relative Prices and the Pattern of Trade

Factor Abundance

– Home country is labor-abundant compared to Foreign country (and Foreign is land-abundant compared to Home) if and only if the ratio of the total amount of labor to the total amount of land available in Home is greater than that in Foreign:

\[ \frac{L}{T} > \frac{L^*}{T^*} \]

Example: if America has 80 million workers and 200 million acres, while Britain has 20 million workers and 20 million acres, then Britain is labor-abundant and America island-abundant. In this case, the scarce factor in Home is land and in Foreign is labor.

When Home and Foreign trade with each other, their relative prices converge. The relative price of cloth rises in Home and declines in Foreign.

In Home, the rise in the relative price of cloth leads to a rise in the production of cloth and a decline in relative consumption, so Home becomes an exporter of cloth and an importer of food. Conversely, the decline in the relative price of cloth in Foreign leads it to become an importer of cloth and an exporter of food.

Figure 4-8: Trade Leads to a Convergence of Relative Prices

Heckscher-Ohlin Theorem:

A country will export that commodity which uses intensively its abundant factor and import that commodity which uses intensively its scarce factor.

Trade and the Distribution of Income

Trade produces a convergence of relative prices; Changes in relative prices have strong effects on the relative earnings of labor and land in both countries:
– In Home, where the relative price of cloth rises: Laborers are made better off and landowners are made worse off.
– In Foreign, where the relative price of cloth falls, the opposite happens: Laborers are made worse off and landowners are made better off.

Owners of a country’s abundant factors gain from trade, but owners of a country’s scarce factors lose.

Difference between the specific factors model and the Heckscher-Ohlin model in terms of income distribution effects: The specificity of factors to particular industries is often only a temporary problem. Example: Garment makers cannot become computer manufacturers overnight, but given time the U.S. economy can shift its manufacturing employment from declining sectors to expanding ones. In contrast, effects of trade on the distribution of income among labor, land, and capital are more or less permanent.

Factor Price Equalization

In the absence of trade: labor would earn less in Home than in Foreign, and land would earn more.

Factor-Price Equalization Theorem:

International trade leads to complete equalization in the relative and absolute returns to homogeneous factors across countries. It implies that international trade is a substitute for the international mobility of factors.

Has international trade equalized the returns to homogeneous factors in different countries in the real world?
– Even casual observation clearly indicates that it has not.
– Example: Wages are much higher for doctors, engineers, technicians, mechanics and laborers in the United States and Germany than in Korea and Mexico.

Under these circumstances, it is more realistic to say that international trade has reduced, rather than completely eliminated, the international difference in the returns to homogeneous factors.

Table 4-1: Comparative International Wage Rates (United States = 100)

<table>
<thead>
<tr>
<th>Country</th>
<th>Hourly Compensation of Production Workers, 2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>100</td>
</tr>
<tr>
<td>Germany</td>
<td>121</td>
</tr>
<tr>
<td>Japan</td>
<td>111</td>
</tr>
<tr>
<td>Spain</td>
<td>55</td>
</tr>
<tr>
<td>South Korea</td>
<td>41</td>
</tr>
<tr>
<td>Portugal</td>
<td>24</td>
</tr>
<tr>
<td>Mexico</td>
<td>12</td>
</tr>
<tr>
<td>Sri Lanka*</td>
<td>2</td>
</tr>
</tbody>
</table>

*1999

Three assumptions crucial to the prediction of factor price equalization are in reality untrue:
– Both countries produce both goods
– Both countries have the same technologies in production
– Both countries have the same prices of goods due to trade

One thing the factor-price equalization theorem does not say is that international trade will eliminate or reduce international differences in per capita incomes.

Table 4-2: Composition of Developing-Country Exports (Percent of Total)

<table>
<thead>
<tr>
<th>1973</th>
<th>1995</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Products</td>
<td>50</td>
</tr>
<tr>
<td>Mining Products</td>
<td>14.5</td>
</tr>
<tr>
<td>Manufactured Goods</td>
<td>22</td>
</tr>
</tbody>
</table>

Empirical Evidence on the Heckscher-Ohlin Model

Testing the Heckscher-Ohlin Model

Tests on U.S. Data

Leontief paradox: Leontief found that U.S. exports were less capital-intensive than U.S. imports, even though the U.S. is the most capital-abundant country in the world.

Tests on Global Data

A study by Bowen, Leamer, and Syvekauskas tested the Leontief model using data for a large number of countries. This study confirms the Leontief paradox on a broader level.

Table 4-3: Factor Content of U.S. Exports and Imports for 1962

<table>
<thead>
<tr>
<th>Imports</th>
<th>Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital per million dollars</td>
<td>$2,132,000</td>
</tr>
<tr>
<td>Labor (hours-years) per million dollars</td>
<td>1.19</td>
</tr>
<tr>
<td>Capital-labor ratio (dollars per worker)</td>
<td>$17,316</td>
</tr>
<tr>
<td>Average years of education per worker</td>
<td>9.9</td>
</tr>
<tr>
<td>Proportion of engineers and scientists in work force</td>
<td>0.0189</td>
</tr>
</tbody>
</table>

Empirical Evidence on the Heckscher-Ohlin Model

Table 4-4: Testing the Heckscher-Ohlin Model
Tests on North-South Trade
North-South trade in manufactures seems to fit the Heckscher-Ohlin theory much better than the overall pattern of international trade.

The Case of the Missing Trade
A study by Trefler in 1995 showed that technological differences across a sample of countries are very large.

Table 4-5: Trade Between the United States and South Korea, 1992 (million dollars)

<table>
<thead>
<tr>
<th>Type of Product</th>
<th>U.S. Exports to South Korea</th>
<th>U.S. Imports from South Korea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemicals, plastics, pharmaceuticals</td>
<td>1340</td>
<td>105</td>
</tr>
<tr>
<td>Power-generating equipment</td>
<td>705</td>
<td>93</td>
</tr>
<tr>
<td>Professional and scientific instruments</td>
<td>512</td>
<td>96</td>
</tr>
<tr>
<td>Transport equipment other than rail vehicles (mainly aircraft)</td>
<td>1531</td>
<td>78</td>
</tr>
<tr>
<td>Clothing and shoes</td>
<td>11</td>
<td>4203</td>
</tr>
</tbody>
</table>

Table 4-6: Estimated Technological Efficiency, 1983 (United States = 1)

<table>
<thead>
<tr>
<th>Country</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>0.03</td>
</tr>
<tr>
<td>Thailand</td>
<td>0.17</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>0.40</td>
</tr>
<tr>
<td>Japan</td>
<td>0.70</td>
</tr>
<tr>
<td>West Germany</td>
<td>0.78</td>
</tr>
</tbody>
</table>

Implications of the Tests
Empirical evidence on the Heckscher-Ohlin model has led to the following conclusions:
- It has been less successful at explaining the actual pattern of international trade.
- It has been useful as a way to analyze the effects of trade on income distribution.

Summary
The Heckscher-Ohlin model, in which two goods are produced using two factors of production, emphasizes the role of resources in trade. A rise in the relative price of the labor-intensive good will shift the distribution of income in favor of labor: the real wage of labor will rise in terms of both goods, while the real income of landowners will fall in terms of both goods. For any given commodity prices, an increase in a factor of production increases the supply of the good that uses this factor intensively and reduces the supply of the other good. The Heckscher-Ohlin theorem predicts the following pattern of trade: a country will export that commodity which uses intensively its abundant factor and import that commodity which uses intensively its scarce factor.

The owners of a country’s abundant factors gain from trade, but the owners of scarce factors lose. In reality, complete factor price equalization is not observed because of wide differences in resources, barriers to trade, and international differences in technology. Empirical evidence is mixed on the Heckscher-Ohlin model.

Appendix: Factor Prices, Goods Prices, and Input Choices

Figure 4A-1: Choosing the Optimal Land-Labor Ratio

Figure 4A-2: Changing the Wage-Rental Ratio

Figure 4A-3: Determining the Wage-Rental Ratio

Figure 4A-4: A Rise in the Price of Cloth

Figure 5-1: Relative Prices Determine the Economy’s Output
Relative Prices and Demand
The value of an economy's consumption equals the value of its production:

\[ P_C Q_C + P_F Q_F = P_C D_C + P_F D_F = V \]

The economy's choice of a point on the isovalue line depends on the tastes of its consumers, which can be represented graphically by a series of indifference curves.

Indifference curves
Each traces a set of combinations of cloth (C) and food (F) consumption that leave the individual equally well off.

They have three properties:
1. Downward sloping
2. The farther up and to the right each lies, the higher the level of welfare to which it corresponds
3. Each gets flatter as we move to the right

If the relative price of cloth, PC/PF, increases, the economy's consumption choice shifts from D1 to D2. The move from D1 to D2 reflects two effects:

- Income effect
- Substitution effect

It is possible that the income effect will be so strong that when PC/PF rises, consumption of both goods actually rises, while the ratio of cloth consumption to food consumption falls.
Relative Supply and the Terms of Trade

Export-biased growth
- Disproportionately expands a country’s production possibilities in the direction of the good it exports
- Worsens a growing country’s terms of trade, to the benefit of the rest of the world

Import-biased growth
- Disproportionately expands a country’s production possibilities in the direction of the good it imports
- Improves a growing country’s terms of trade at the rest of the world’s expense

International Effects of Growth
Export-biased growth in the rest of the world improves our terms of trade, while import-biased growth abroad worsens our terms of trade. Export-biased growth in our country worsens our terms of trade, reducing the direct benefits of growth, while import-biased growth leads to an improvement of our terms of trade.

Immiserizing growth
A situation where export-biased growth by poor nations can worsen their terms of trade so much that they would be worse off than if they had not grown at all. It can occur under extreme conditions: Strongly export-biased growth must be combined with very steep RS and RD curves. It is regarded by most economists as more a theoretical point than a real-world issue.

Table 5-1: Average Annual Percent Changes in Terms of Trade

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced countries</td>
<td>1.1</td>
<td>0.1</td>
</tr>
<tr>
<td>Oil-exporting countries</td>
<td>-7.5</td>
<td>2.0</td>
</tr>
<tr>
<td>Non-oil-exporting developing countries</td>
<td>-0.6</td>
<td>-0.2</td>
</tr>
</tbody>
</table>

International Transfers of Income: Shifting the RD Curve
International transfers of income, such as war reparations and foreign aid, may affect a country’s terms of trade by shifting the world relative demand curve.

Relative world demand for goods may shift because of:
1. Changes in tastes
2. Changes in technology
3. International transfers of income

The Transfer Problem
- How international transfers affect the terms of trade

Effects of a Transfer on the Terms of Trade
When both countries allocate their change in spending in the same proportions (Ohlin’s point): The RD curve will not shift, and there will be no terms of trade effect. When the two countries do not allocate their change in spending in the same proportions (Keynes’s point): The RD curve will shift and there will be a terms of trade effect. The direction of the effect on terms of trade will depend on the difference in Home and Foreign spending patterns.

Presumptions about the Terms of Trade Effects of Transfers
A transfer will worsen the donor’s terms of trade if the donor has a higher marginal propensity to spend on its export good than the recipient. In practice, most countries spend a much higher share of their income on domestically produced goods than foreigners do. This is not necessarily due to differences in taste but rather to barriers to trade, natural and artificial. Import tariffs and export subsidies affect both relative supply and relative demand.

Relative Demand and Supply Effects of a Tariff
Tariffs drive a wedge between the prices at which goods are traded internationally (external prices) and the prices at which they are traded within a country (internal prices). The terms of trade correspond to external, not internal, prices. Tariffs and Export Subsidies: Simultaneous shifts in RS and RD

Effects of an Export Subsidy
Tariffs and export subsidies are often treated as similar policies but they have opposite effects on the terms of trade.

Example: Suppose that Home offers 20% subsidy on the value of cloth exported:
- This will raise Home’s internal price of cloth relative to food by 20%.
- This will lead Home producers to produce more cloth and less food.

A Home export subsidy worsens Home’s terms of trade and improves Foreign’s.

Tariffs and Export Subsidies: Simultaneous Shifts in RS and RD
Implications of Terms of Trade Effects: Who Gains and Who Loses?

The International Distribution of Income

If Home (a large country) imposes a tariff, its welfare increases as long as the tariff is not too large, while Foreign’s welfare decreases. If Home offers an export subsidy, its welfare deteriorates, while Foreign’s welfare increases.

The Distribution of Income Within Countries

A tariff (subsidy) has the direct effect of raising the internal relative price of the imported (exported) good. Tariffs and export subsidies might have perverse effects on internal prices (Metzler paradox).

Summary

The standard trade model provides a framework that can be used to address a wide range of international issues and admits previous trade models as special cases. Economic growth is usually biased. Growth that is export-biased (import-biased) worsens (improves) the terms of trade.

International transfers of income may affect a country’s terms of trade, depending if they shift the world relative demand curve. Import tariffs and export subsidies affect both relative supply and demand. The terms of trade effects of an export subsidy hurt the exporting country and benefit the rest of the world, while those of a tariff do the reverse. Both trade instruments have strong income distribution effects within countries.

Appendix: Representing International Equilibrium with Offer Curves

Figure 5A-1: Home’s Desired Trade at a Given Relative Price

Figure 5A-2: Home’s Offer Curve

Figure 5A-3: Foreign’s Offer Curve

Figure 5A-4: Offer Curve Equilibrium

Countries engage in international trade for two basic reasons:

1. Countries trade because they differ either in their resources or in technology.
2. Countries trade in order to achieve scale economies or increasing returns in production.

Two models of international trade in which economies of scale and imperfect competition play a crucial role:

1. Monopolistic competition model
2. Dumping model

Economies of Scale and International Trade: An Overview

Models of trade based on comparative advantage (e.g., Ricardian model) used the assumptions of constant returns to scale and perfect competition: Increasing the amount of all inputs used in the production of any commodity will increase output of that commodity in the same proportion.

In practice, many industries are characterized by economies of scale (also referred to as increasing returns). Production is most efficient, the larger the scale at which it takes place.

Under increasing returns to scale:

- Output grows proportionately more than the increase in all inputs.
- Average costs (costs per unit) decline with the size of the market.

Table 6-1: Relationship of Input to Output for a Hypothetical Industry

<table>
<thead>
<tr>
<th>Output</th>
<th>Total Labor Input</th>
<th>Average Labor Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>10</td>
<td>2.00</td>
</tr>
<tr>
<td>10</td>
<td>15</td>
<td>1.50</td>
</tr>
<tr>
<td>15</td>
<td>20</td>
<td>1.3333</td>
</tr>
<tr>
<td>20</td>
<td>25</td>
<td>1.25</td>
</tr>
<tr>
<td>25</td>
<td>30</td>
<td>1.0000</td>
</tr>
<tr>
<td>30</td>
<td>35</td>
<td>1.0000</td>
</tr>
</tbody>
</table>

Economies of Scale and Market Structure

Economies of scale can be either:

External
- The cost per unit depends on the size of the industry but not necessarily on the size of any one firm.
- An industry will typically consist of many small firms and be perfectly competitive.

Internal
- The cost per unit depends on the size of an individual firm but not necessarily on that of the industry.
- The market structure will be imperfectly competitive with large firms having a cost advantage over small.

Both types of scale economies are important causes of international trade.

Imperfect competition

Firms are aware that they can influence the price of their product. They know that they can sell more only by reducing their price. Each firm views itself as a price setter, choosing the price of its product, rather than a price taker. The simplest imperfectly competitive market structure is that of a pure monopoly, a market in which a firm faces no competition.
The Theory of Imperfect Competition

Monopoly: A Brief Review
Marginal revenue
- The extra revenue the firm gains from selling an additional unit
- Its curve, MR, always lies below the demand curve, D.
- In order to sell an additional unit of output the firm must lower the price of all units sold (not just the marginal one).

The Theory of Imperfect Competition

Figure 6-1: Monopolistic Pricing and Production Decisions

Cost, C and Price, P

Monopoly profits

Marginal Revenue and Price
Marginal revenue is always less than the price. – The relationship between marginal revenue and price depends on two things:
- How much output the firm is already selling
- The slope of the demand curve

It tells us how much the monopolist has to cut his price to sell one more unit of output.

Assume that the demand curve the firm faces is a straight line:

\[ Q = A - B \times P \]  
(6-1)

Then the MR that the firm faces is given by:

\[ MR = P - Q/B \]  
(6-2)

Average and Marginal Costs
- Average Cost (AC) istotal cost divided by output.
- Marginal Cost (MC) isthe amount it costs the firm to produce one extra unit.

When average costs decline in output, marginal cost is always less than average cost. Suppose the costs of a firm, C, take the form:

\[ C = F + c \times Q \]  
(6-3)

This is a linear cost function.
- The fixed cost in a linear cost function gives rise to economies of scale, because the larger the firm’s output, the less is fixed cost per unit.

The firm’s average costs is given by:

\[ AC = C/Q = F/Q + c \]  
(6-4)

Monopolistic Competition

Oligopoly

Internal economies generate an oligopoly market structure. There are several firms, each of which is large enough to affect prices, but none with an uncontested monopoly. Strategic interactions among oligopolists have become important. Each firm decides its own actions, taking into account how that decision might influence its rival’s actions.

Monopolistic competition
A special case of oligopoly. Two key assumptions are made to get around the problem of interdependence:
- Each firm is assumed to be able to differentiate its product from its rivals.
- Each firm is assumed to take the prices charged by its rivals as given.

Are there any monopolistically competitive industries in the real world? Some industries may be reasonable approximations (e.g., the automobile industry in Europe). The main appeal of the monopolistic competition model is not its realism, but its simplicity.

Assumptions of the Model
Imagine an industry consisting of a number of firms producing differentiated products. We expect a firm: To sell more the larger the total demand for its industry’s product and the higher the prices charged by its rivals, To sell less the greater the number of firms in the industry and the higher its own price.

A particular equation for the demand facing a firm that has these properties is:

\[ Q = Sx[1/n - bx(P - P)] \]  
(6-5)

where:
- \( Q \) is the firm’s sales
- \( S \) is the total sales of the industry
- \( n \) is the number of firms in the industry
- \( b \) is a constant term representing the responsiveness of a firm’s sales to its price
- \( P \) is the price charged by the firm itself
- \( P \) is the average price charged by its competitors

Market Equilibrium
All firms in this industry are symmetric. The demand function and cost function are identical for all firms. The method for determining the number of firms and the average price charged involves three steps:

1. We derive a relation between the number of firms and the average cost of a typical firm.
2. We derive a relation between the number of firms and the price each firm charges.
3. We derive the equilibrium number of firms and the average price that firms charge.

The number of firms and average cost
- How do the average costs depend on the number of firms in the industry? Under symmetry, \( P = P \) equation (6-5) tells us that: \( Q = S/n \) Substituting equation (6-4) shows us that the average cost depends inversely on the number of firms in the industry.

\[ AC = C/Q = nxF/S + c \]  
(6-6)

The more firms there are in the industry the higher is the average cost.

Figure 6-3: Equilibrium in a Monopolistically Competitive Market

Cost C and Price, P

The number of firms and the price
The price the typical firm charges depends on the number of firms in the industry. The more firms, the more competition, and hence the lower the price. In the monopolistic competition model firms are assumed to take each others’ prices as given. If each firm treats \( P \) as given, we can rewrite the demand curve (6-5) in the form:

\[ Q = (5/n + S x b x P) - S x b x P \]  
(6-7)

The equilibrium number of firms
Profit-maximizing firms set marginal revenue equal to their marginal cost. – This generates a negative relationship between the price and the number of firms in the market which is the PP curve:

\[ P = c + 1/(b x n) \]  
(6-10)
The downward-sloping curve PP shows that the more firms, the lower the price each firm will charge. The more firms, the more competition each firm faces. The upward-sloping curve CC tells us that the more firms there are, the higher the average cost of each firm.

If the number of firms increases, each firm will sell less, so firms will not be able to move as far down their average cost curve.

Limitations of the Monopolistic Competition Model
Two kinds of behavior arise in the general oligopoly setting that are excluded by assumption from the monopolistic competition model:

Collusive behavior:
- Can raise the profits of all firms at the expense of consumers
- May be managed through explicit agreements or through tacit coordination strategies

Strategic behavior:
- Is adopted by firms to affect the behavior of competitors in a desirable way
- Deters potential rivals from entering an industry

Monopolistic Competition and Trade
The monopolistic competition model can be used to show how trade leads to a lower average price due to scale economies, the availability of a greater variety of goods due to product differentiation, imports and exports within each industry (intra-industry trade).

The Effects of Increased Market Size
The number of firms in a monopolistically competitive industry and the prices they charge are affected by the size of the market.

Monopolistic Competition and Trade

Gains from an Integrated Market: A Numerical Example
International trade allows creation of an integrated market that is larger than each country’s market. It thus becomes possible to offer consumers a greater variety of products and lower prices.

Example: Suppose that automobiles are produced by a monopolistically competitive industry.

Assume the following:
\[-b= \frac{1}{30,000} \]
\[-F= \$750,000,000 \]
\[-c= \$5000 \]

There are two countries (Home and Foreign) that have the same costs of automobile production. Annual sales of automobiles are 900,000 at Home and 1.6 million at Foreign.

Figure 6-4: Effects of a Larger Market

Table 6-2: Hypothetical Example of Gains from Market Integration

Economies of Scale and Comparative Advantage
Assumptions:
There are two countries: Home (the capital-abundant country) and Foreign. There are two industries: manufactures (the capital-intensive industry) and food. Neither country is able to produce the full range of manufactured products by itself due to economies of scale.

Figure 6-6: Trade in a World Without Increasing Returns

If manufactures is a monopolistically competitive sector, world trade consists of two parts:

- Intraindustry trade: The exchange of manufactures for manufactures
- Interindustry trade: The exchange of manufactures for food
Main differences between interindustry and intraindustry trade:
Interindustry trade reflects comparative advantage, whereas intraindustry trade does not. The pattern of intraindustry trade itself is unpredictable, whereas that of interindustry trade is determined by underlying differences between countries. The relative importance of intraindustry and interindustry trade depends on how similar countries are.

The Significance of Intraindustry Trade
About one-fourth of world trade consists of intra-industry trade. Intra-industry trade plays a particularly large role in the trade in manufactured goods among advanced industrial nations, which accounts for most of world trade.

Table 6-3: Indexes of Intraindustry Trade for U.S. Industries, 1993

<table>
<thead>
<tr>
<th>Industry</th>
<th>Index (1993)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic chemicals</td>
<td>0.99</td>
</tr>
<tr>
<td>Power-generating machinery</td>
<td>0.97</td>
</tr>
<tr>
<td>Electrical machinery</td>
<td>0.96</td>
</tr>
<tr>
<td>Organic chemicals</td>
<td>0.91</td>
</tr>
<tr>
<td>Medical and pharmaceutical</td>
<td>0.86</td>
</tr>
<tr>
<td>Office machinery</td>
<td>0.81</td>
</tr>
<tr>
<td>Telecommunications equipment</td>
<td>0.69</td>
</tr>
<tr>
<td>Road vehicles</td>
<td>0.65</td>
</tr>
<tr>
<td>Iron and steel</td>
<td>0.43</td>
</tr>
<tr>
<td>Clothing and apparel</td>
<td>0.27</td>
</tr>
<tr>
<td>Footwear</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Why Intraindustry Trade Matters
Intraindustry trade allows countries to benefit from larger markets. The case study of the North American Auto Pact of 1964 indicates that the gains from creating an integrated industry in two countries can be substantial. Gains from intraindustry trade will be large when economies of scale are strong and products are highly differentiated. For example, sophisticated manufactured goods.

Monopolistic Competition and Trade
The Economics of Dumping
Price discrimination: The practice of charging different customers different prices.

Dumping
The most common form of price discrimination in international trade. A pricing practice in which a firm charges a lower price for an exported good than it does for the same good sold domestically. It is a controversial issue in trade policy and is widely regarded as an unfair practice in international trade. Example: As of April 2002, the United States had anti-dumping duties on 265 items from 40 different countries.

Dumping can occur only if two conditions are met:
- Imperfectly competitive industry
- Segmented markets

Given these conditions, a monopolistic firm may find that it is profitable to engage in dumping.

Figure 6-8: Dumping

Reciprocal Dumping
A situation in which dumping leads to two-way trade in the same product.

It increases the volume of trade in goods that are not quite identical. Its net welfare effect is ambiguous:
- It wastes resources in transportation.
- It creates some competition.

The Theory of External Economies
Economies of scale that occur at the level of the industry instead of the firm are called external economies. There are three main reasons why a cluster of firms may be more efficient than an individual firm in isolation:
1. Specialized suppliers
2. Labor market pooling
3. Knowledge spillovers

Specialized Suppliers
In many industries, the production of goods and services and the development of new products requires the use of specialized equipment or support services. An individual company does not provide a large enough market for these services to keep the suppliers in business. A localized industrial cluster can solve this problem by bringing together many firms that provide a large enough market to support specialized suppliers. This phenomenon has been extensively documented in the semiconductor industry located in Silicon Valley.

Labor Market Pooling
A cluster of firms can create a pooled market for workers with highly specialized skills. It is an advantage for:
- Producers: They are less likely to suffer from labor shortages.
- Workers: They are less likely to become unemployed.

Knowledge Spillovers
Knowledge is one of the important input factors in highly innovative industries. The specialized knowledge that is crucial to success in innovative industries comes from:
- Research and development efforts
- Reverse engineering
- Informal exchange of information and ideas

External Economies and Increasing Returns
External economies can give rise to increasing returns to scale at the level of the national industry.

Forward-falling supply curve
The larger the industry’s output, the lower the price at which firms are willing to sell their output.

The Theory of External Economies
External Economies and the Pattern of Trade
A country that has large production in some industry will tend to have low costs of producing that good. Countries that start out as large producers in certain industries tend to remain large producers even if some other country could potentially produce the goods more cheaply. Figure 6-9 illustrates a case where a pattern of specialization established by historical accident is persistent.

Trade and Welfare with External Economies
Trade based on external economies has more ambiguous effects on national welfare than either trade based on comparative advantage or trade based on economies of scale at the level of the firm. An example of how a country can actually be worse off with trade than without is shown in Figure 6-10.

Figure 6-10: External Economies and Losses from Trade
− It relates unit cost to cumulative output.
− It is downward sloping because of the effect of the experience gained though production on costs.

Dynamic increasing returns
A case when costs fall with cumulative production over time, rather than with the current rate of production. Dynamic scale economies justify protectionism. Temporary protection of industries enables them to gain experience (infant industry argument).

Figure 6-11: The Learning Curve

Summary
Trade can result from increasing returns or economies of scale, that is, from a tendency of unit costs to be lower at larger levels of output. Economies of scale can be internal or external. The presence of scale economies leads to a breakdown of perfect competition. Trade in the presence of economies of scale must be analyzed using models of imperfect competition. In monopolistic competition, an industry contains a number of firms producing differentiated products. Intraindustry trade benefits consumers through greater product variety and lower prices. In general, trade may be divided into two kinds:
1. Two-way trade in differentiated products within an industry (intraindustry trade).
2. Trade in which the products of one industry are exchanged for products of another (interindustry trade).

Dumping occurs when a firm charges a lower price abroad than it charges domestically. Dumping can occur only if two conditions are met:
1. The industry must be imperfectly competitive.
2. Markets must be geographically segmented.

External economies give an important role to history and accident in determining the pattern of international trade. When external economies are important, countries can conceivably lose from trade.

CHAPTER 8
THE INSTRUMENTS OF TRADE POLICY

Classification of Commercial Policy Instruments

Basic Tariff Analysis
Tariffs can be classified as:
Specific tariffs
Taxes that are levied as a fixed charge for each unit of goods imported. Example: A specific tariff of $10 on each imported bicycle with an international price of $100 means that customs officials collect the fixed sum of $10.
Ad valorem tariffs
Taxes that are levied as a fraction of the value of the imported goods. Example: A 20% ad valorem tariff on bicycles generates a $20 payment on each $100 imported bicycle.

A compound duty (tariff) is a combination of an ad valorem and a specific tariff. Modern governments usually prefer to protect domestic industries through a variety of nontariff barriers, such as:
− Import quotas: Limit the quantity of imports
− Export restraints: Limit the quantity of exports

Supply, Demand, and Trade in a Single Industry
Suppose that there are two countries (Home and Foreign). Both countries consume and produce wheat, which can be costlessly transported between the countries. In each country, wheat is a competitive industry. Suppose that in the absence of trade the price of wheat at Home exceeds the corresponding price at Foreign. This implies that shippers begin to move wheat from Foreign to Home. The export of wheat raises its price in Foreign and lowers its price in Home until the initial difference in prices has been eliminated. To determine the world price (Pw) and the quantity traded (Qw), two curves are defined:

Home import demand curve
Shows the maximum quantity of imports the Home country would like to consume at each price of the imported good. That is, the excess of what Home consumers demand over what Home producers supply:

\[ MD = D(P) - S(P) \]

Foreign export supply curve
Shows the maximum quantity of exports Foreign would like to provide the rest of the world at each price. That is, the excess of what Foreign producers supply over what foreign consumers demand:

\[ XS = S^*(P^*) - D^*(P^*) \]

Figure 8-1: Deriving Home’s Import Demand Curve

Properties of the import demand curve:
1. It intersects the vertical axis at the closed economy price of the importing country.
2. It is downward sloping.
3. It is flatter than the domestic demand curve in the importing country.

Figure 8-2: Deriving Foreign’s Export Supply Curve

Properties of the export supply curve:
1. It intersects the vertical axis at the closed economy price of the exporting country.
2. It is upward sloping.
3. It is flatter than the domestic supply curve in the exporting country.

Figure 8-3: World Equilibrium
Useful definitions:

The terms of trade is the relative price of the exportable good expressed in units of the importable good. A small country is a country that cannot affect its terms of trade no matter how much it trades with the rest of the world. The analytical framework will be based on either of the following:

Two large countries trading with each other

A small country trading with the rest of the world

Effects of a Tariff

Assume that two large countries trade with each other. Suppose Home imposes a tax of $2 on every bushel of wheat imported. Then shippers will be unwilling to move the wheat unless the price difference between the two markets is at least $2.

In the absence of tariff, the world price of wheat ($P_w$) would be equalized in both countries. With the tariff in place, the price of wheat rises to $P_T$ at Home and falls to $P*T (= PT − t)$ at Foreign until the price difference is $t$.

- In Home: producers supply more and consumers demand less due to the higher price, so that fewer imports are demanded.
- In Foreign: producers supply less and consumers demand more due to the lower price, so that fewer exports are supplied.

Thus, the volume of wheat traded declines due to the imposition of the tariff. The increase in the domestic Home price is less than the tariff, because part of the tariff is reflected in a decline in Foreign’s export price. If Home is a small country and imposes a tariff, the foreign export prices are unaffected and the domestic price at Home (the importing country) rises by the full amount of the tariff.

In analyzing trade policy in practice, it is important to know how much protection a trade policy actually provides. One can express the amount of protection as a percentage of the price that would prevail under free trade. Two problems arise from this method of measurement:

1. In the large country case, the tariff will lower the foreign export price.
2. Tariffs may have different effects on different stages of production of a good.

Effective rate of protection

One must consider both the effects of tariffs on the final price of a good, and the effects of tariffs on the costs of inputs used in production. The actual protection provided by a tariff will not equal the tariff rate if imported intermediate goods are used in the production of the protected good. Example: A European airplane that sells for $50 million has cost $60 million to produce. Half of the purchase price of the aircraft represents the cost of components purchased from other countries. A subsidy of $10 million from the European government cuts the cost of the value added to purchasers of the airplane from $30 to $20 million. Thus, the effective rate of protection is (30−20)/20 = 50%.

Costs and Benefits of a Tariff

A tariff raises the price of a good in the importing country and lowers it in the exporting country. As a result of these price changes:

- Consumers lose in the importing country and gain in the exporting country
- Producers gain in the importing country and lose in the exporting country
- Government imposing the tariff gains revenue

To measure and compare these costs and benefits, we need to define consumer and producer surplus.

Consumer and Producer Surplus

Consumer surplus

It measures the amount a consumer gains from a purchase by the difference between the price he actually pays and the price he would have been willing to pay. It can be derived from the market demand curve. Graphically, it is equal to the area under the demand curve and above the price.

Example: Suppose a person is willing to pay $20 per packet of pills, but the price is only $5. Then, the consumer surplus gained by the purchase of a packet of pills is $15.

Producer surplus

It measures the amount a producer gains from a sale by the difference between the price he actually receives and the price at which he would have been willing to sell. It can be derived from the market supply curve. Graphically, it is equal to the area above the supply curve and below the price.

Example: A producer willing to sell a good for $2 but receiving a price of $5 gains a producer surplus of $3.

Measuring the Amount of Protection

In the large country case, the tariff will lower the foreign export price. Figure 8-4 illustrates the effects of a specific tariff of $t per unit of wheat.
Measuring the Cost and Benefits

Is it possible to add consumer and producer surplus? We can (algebraically) add consumer and producer surplus because any change in price affects each individual in two ways:

– As a consumer
– As a worker

We assume that at the margin a dollar’s worth of gain or loss to each group is of the same social worth.

Figure 8-9: Costs and Benefits of a Tariff for the Importing Country

The areas of the two triangles band d measure the loss to the nation as a whole (efficiency loss) and the area of the rectangle e measures an offsetting gain (terms of trade gain). The efficiency loss arises because a tariff distorts incentives to consume and produce. Producers and consumers act as if imports were more expensive than they actually are. Triangle b is the production distortion loss and triangle d is the consumption distortion loss. The terms of trade gain arises because a tariff lowers foreign export prices. If the terms of trade gain is greater than the efficiency loss, the tariff increases welfare for the importing country. In the case of a small country, the tariff reduces welfare for the importing country.

Figure 8-10: Net Welfare Effects of a Tariff

Other Instruments of Trade Policy

Export Subsidies: Theory

Export subsidy
A payment by the government to a firm or individual that ships a good abroad. When the government offers an export subsidy, shippers will export the good up to the point where the domestic price exceeds the foreign price by the amount of the subsidy. It can be either specific or ad valorem.

Export subsidy raises prices in the exporting country while lowering them in the importing country. In addition, and in contrast to a tariff, the export subsidy unambiguously leads to costs that exceed its benefits.

Figure 8-12: Europe’s Common Agricultural Program

Import Quotas: Theory

An import quota is a direct restriction on the quantity of a good that is imported. Example: The United States has a quota on imports of foreign cheese. The restriction is usually enforced by issuing licenses to some group of individuals or firms. Example: The only firms allowed to import cheese are certain trading companies. In some cases (e.g. sugar and apparel), the right to sell in the United States is given directly to the governments of exporting countries. An import quota always raises the domestic price of the imported good. License holders are able to buy imports and resell them at a higher price in the domestic market. The profits received by the holders of import licenses are known as quota rents.

Welfare analysis of import quotas versus of that of tariffs—The difference between a quota and a tariff is that with a quota the government collects no revenue. In assessing the costs and benefits of an import quota, it is crucial to determine who gets the rents. When the rights to sell in the domestic market are assigned to governments of exporting countries, the transfer of rents abroad makes the costs of a quota substantially higher than the equivalent tariff.

Figure 8-13: Effects of the U.S. Import Quota on Sugar

Voluntary Export Restraints

A voluntary export restraint (VER) is an export quota administered by the exporting country. It is also known as a voluntary restraint agreement (VRA). VERs are imposed at the request of the importer and are agreed to by the exporter to forestall other trade restrictions.

A VER is exactly like an import quota where the licenses are assigned to foreign governments and is therefore very costly to the importing country.
A VER is always more costly to the importing country than a tariff that limits imports by the same amount. The tariff equivalent revenue becomes rents earned by foreigners under the VER. Example: About 2/3 of the cost to consumers of the three major U.S. voluntary restraints in textiles and apparel, steel, and automobiles is accounted for by the rents earned by foreigners. A VER produces a loss for the importing country.

Local Content Requirements
A local content requirement is a regulation that requires that some specified fraction of a final good be produced domestically. This fraction can be specified in physical units or in value terms. Local content laws have been widely used by developing countries trying to shift their manufacturing base from assembly back into intermediate goods. Local content laws do not produce either government revenue or quota rents. Instead, the difference between the prices of imports and domestic goods gets averaged in the final price and is passed on to consumers. Example: Suppose that auto assembly firms are required to use 50% domestic parts. The cost of imported parts is $6000 and the cost of the same parts domestically is $10,000. Then the average cost of parts is $8000 (0.5 x $6000 + 0.5 x $10,000). Firms are allowed to satisfy their local content requirement by exporting instead of using parts domestically.

Other Trade Policy Instruments
Export credit subsidies
A form of a subsidized loan to the buyer of exports. They have the same effect as regular export subsidies.

National procurement
Purchases by the government (or public firms) can be directed towards domestic goods, even if they are more expensive than imports.

Red-tape barriers
Sometimes governments place substantial barriers based on health, safety and customs procedures.

Table 8-1: Effects of Alternative Trade Policies

<table>
<thead>
<tr>
<th>Tariff</th>
<th>Export subsidy</th>
<th>Import quota</th>
<th>Voluntary export restraint</th>
</tr>
</thead>
<tbody>
<tr>
<td>Producer surplus</td>
<td>Increases</td>
<td>Increases</td>
<td>Increases</td>
</tr>
<tr>
<td>Consumer surplus</td>
<td>Falls</td>
<td>Falls</td>
<td>Falls</td>
</tr>
<tr>
<td>Government</td>
<td>Increases</td>
<td>Falls</td>
<td>No change</td>
</tr>
<tr>
<td>(government spending rises)</td>
<td>(rents to license holders)</td>
<td>(rents to foreigners)</td>
<td></td>
</tr>
<tr>
<td>Overall national welfare</td>
<td>Ambiguous</td>
<td>Ambiguous</td>
<td>Ambiguous</td>
</tr>
<tr>
<td>(falls for small country)</td>
<td>(falls for small country)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Summary
A tariff drives a wedge between foreign and domestic prices, raising the domestic price but by less than the tariff rate (except in the “small” country case). In the small country case, a tariff is fully reflected in domestic prices. The costs and benefits of a tariff or other trade policy instruments may be measured using the concepts of consumer and producer surplus.

- The domestic producers of a good gain
- The domestic consumers lose
- The government collects tariff revenue

The net welfare effect of a tariff can be separated into two parts:
1. Efficiency (consumption and production) loss
2. Terms of trade gain (is zero in the case of a small country)

An export subsidy causes efficiency losses similar to a tariff but compounds these losses by causing a deterioration of the terms of trade. Under import quotas and voluntary export restraints the government of the importing country receives no revenue.

Appendix I: Tariff Analysis in General Equilibrium
Table BAI-1: Free Trade Equilibrium for a Small Country

Table BAI-2: A Tariff in a Small Country

Table BAI-3: Comparing a Tariff and a Quota

Table BAI-4: A Monopolist Under Free Trade

Table BAI-5: A Monopolist Protected by a Tariff

Table BAI-6: A Monopolist Protected by an Import Quota
Free Trade and Efficiency
The efficiency argument for free trade is based on the result that in the case of a small country, free trade is the best policy. A tariff causes a net loss to the economy. A move from a tariff equilibrium to free trade eliminates the efficiency loss and increases national welfare.

Figure 9-1: The Efficiency Case for Free Trade

Table 9-1: Estimated Cost of Protection, as a Percentage of National Income

<table>
<thead>
<tr>
<th>Country</th>
<th>Cost of Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil (1966)</td>
<td>9.5</td>
</tr>
<tr>
<td>Turkey (1978)</td>
<td>5.4</td>
</tr>
<tr>
<td>Philippines (1978)</td>
<td>5.4</td>
</tr>
<tr>
<td>United States (1983)</td>
<td>0.26</td>
</tr>
</tbody>
</table>

Additional Gains from Free Trade
Protected markets in small countries do not allow firms to exploit scale economies. Example: In the auto industry, an efficient scale assembly should make a minimum of 80,000 cars per year. In Argentina, 13 firms produced a total of 166,000 cars per year. The presence of scale economies favors free trade that generates more varieties and results in lower prices. Free trade, as opposed to “managed” trade, provides a wider range of opportunities and thus a wider scope for innovation.

Political Argument for Free Trade
A political commitment to free trade may be a good idea in practice. Trade policies in practice are dominated by special-interest politics rather than consideration of national costs and benefits.

National Welfare Arguments Against Free Trade
Activist trade policies can sometimes increase the welfare of the nation as a whole. There are two theoretical arguments against the policy of free trade:
1. The terms of trade argument for a tariff
2. The domestic market failure

The Terms of Trade Argument for a Tariff
For a large country (that is, a country that can affect the world price through trading), a tariff lowers the price of imports and generates a terms of trade benefit. This benefit must be compared to the costs of the tariff (production and consumption distortions). It is possible that the terms of trade benefits of a tariff outweigh its costs. Therefore, free trade might not be the best policy for a large country.

Figure 9-2: The Optimum Tariff

Optimum tariff
The tariff rate that maximizes national welfare. It is always positive but less than the prohibitive rate that would eliminate all imports. It is zero for a small country because it cannot affect its terms of trade.

What policy would the terms of trade argument dictate for export sectors?
An export subsidy worsens the terms of trade, and therefore unambiguously reduces national welfare. Therefore, the optimal policy in export sectors must be a negative subsidy, that is, a tax on exports. Like the optimum tariff, the optimum export tax is always positive but less than the prohibitive tax that would eliminate exports completely.

The Domestic Market Failure Argument Against Free Trade
Producer and consumer surplus do not properly measure social costs and benefits. Consumer and producer surplus ignore domestic market failures such as:
- Unemployment or underemployment of labor
- Technological spillovers from industries that are new or particularly innovative
- Environmental externalities

A tariff may raise welfare if there is a marginal social benefit to production of a good that is not captured by producer surplus measures.

Figure 9-3: The Domestic Market Failure Argument for a Tariff

The domestic market failure argument against free trade is a particular case of the theory of the second best. The theory of the second best states that a hands-off policy is desirable in any one market only if all other markets are working properly. If one market fails to work properly, a government intervention may actually increase welfare.

How Convincing is the Market Failure Argument?
The are two basic arguments against defense of free trade in the presence of domestic distortions:
1. Domestic distortions should be corrected through domestic policies. Example: A domestic production subsidy is superior to a tariff in dealing with a production-related market failure.
2. Market failures are hard to diagnose and measure. Example: A tariff to protect urban industrial sectors will generate social benefits, but it will also encourage migration to these sectors that will result in higher unemployment.

Income Distribution and Trade Policy
In practice, trade policy is dominated by income distribution considerations. The desires of individuals get more or less imperfectly reflected in the objectives of government. There exist models in which governments try to maximize political success.

Electoral Competition  
Political scientists argue that policies are determined by competition among political parties that try to attract as many votes as possible.

Assumptions of the model:  
- There are two competing political parties.  
- The objective of each party is to get elected.  
- Each party has to decide on the level of the tariff imposed (this is the only policy available).  
- Voters differ in the tariff they prefer.

What policies will the two parties promise to follow?  
Both parties will offer the same policy consisting of the tariff that the median voter (the voter who is exactly halfway up the lineup) prefers.

Figure 9-4: Political Competition

Collective Action  
This approach views political activity as a public good. For instance, the imposition of a tariff protects all firms in an industry, but the lobbying costs for imposing the tariff are covered by only a few firms. Trade policies that impose total large losses that are spread among many individual firms or consumers may not face opposition. Industries that are well organized (or have a small number of firms) get protection.

Modeling the Political Process  
Interest groups “buy” policies by offering contributions contingent on the policies followed by the government.

Who Gets Protected?  
Two sectors seem to get protected in advanced countries:

- Agriculture  
  Farmers are well organized and the structure of the U.S. government enhances their political power.

- Clothing  
  Both textiles and apparel have enjoyed substantial protection. This sector employs less skilled workers and it is unionized as well.

Protection is very likely to diminish in the future in both sectors (due to international trade negotiations).

Income Distribution

Table 9-2: Effects of Protection in the United States ($ billion)

<table>
<thead>
<tr>
<th>Effect</th>
<th>Apparel</th>
<th>Textiles</th>
<th>All Industries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer cost</td>
<td>21.16</td>
<td>3.27</td>
<td>32.32</td>
</tr>
<tr>
<td>Producer gain</td>
<td>9.90</td>
<td>1.75</td>
<td>15.78</td>
</tr>
<tr>
<td>Tariff revenue</td>
<td>3.55</td>
<td>0.63</td>
<td>5.80</td>
</tr>
<tr>
<td>Quota rent</td>
<td>5.41</td>
<td>0.71</td>
<td>7.12</td>
</tr>
<tr>
<td>Producer and</td>
<td>2.30</td>
<td>0.18</td>
<td>3.55</td>
</tr>
<tr>
<td>consumer distortion</td>
<td>7.71</td>
<td>0.39</td>
<td>10.46</td>
</tr>
<tr>
<td>Overall welfare loss</td>
<td>7.71</td>
<td>0.39</td>
<td>10.46</td>
</tr>
</tbody>
</table>

International Negotiations and Trade Policy  
International integration has increased from the mid-1930s until about 1980 because the United States and other advanced countries gradually removed tariffs and nontariff barriers to trade.

Figure 9-5: The U.S. Tariff Rate

After rising sharply at the beginning of the 1930s, the average tariff rate of the United States has steadily declined.

How was the removal of tariffs politically possible?  
The postwar liberalization of trade was achieved through international negotiation. Governments agreed to engage in mutual tariff reduction.

The Advantages of Negotiation  
It is easier to lower tariffs as part of a mutual agreement than to do so as a unilateral policy because:
- It helps mobilize exporters to support freer trade.
- It can help governments avoid getting caught in destructive trade wars.

Table 9-3: The Problem of Trade Warfare

<table>
<thead>
<tr>
<th>U.S.</th>
<th>Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free trade</td>
<td>Free trade</td>
</tr>
<tr>
<td>Protection</td>
<td>Protection</td>
</tr>
</tbody>
</table>

In Table 9-3, each country has a dominant strategy: Protection. Even though each country acting individually would be better off with protection, they would both be better off if both chose free trade. In game theory, this situation is known as a Prisoner’s dilemma. Japan and the U.S. can establish a binding agreement to maintain free trade.

International Trade Agreements: A Brief History  
Internationally coordinated tariff reduction as a trade policy dates back to the 1930s (the Smoot-Hawley Act). The multilateral tariff reductions since World War II have taken place under the General Agreement on Tariffs and Trade (GATT), established in 1947 and located in Geneva. It is now called the World Trade Organization (WTO). The GATT-WTO system is a legal organization that embodies a set of rules of conduct for international trade policy.

The GATT-WTO system prohibits the imposition of:
- Export Subsidies (except for agricultural products)
- Import quotas (except when imports threaten “market disruption”)  
- Tariffs (any new tariff or increase in a tariff must be offset by reductions in other tariffs to compensate the affected exporting countries)

Trade round  
A large group of countries get together to negotiate a set of tariff reductions and other measures to liberalize trade. Eight trade round have occurred since 1947. The first five of these took the form of “parallel” bilateral negotiations (e.g., Germany with France and Italy). The sixth multilateral trade agreement, known as the Kennedy Round, was completed in 1967. This agreement involved an across-the-board 50% reduction in tariffs by the major industrial countries, except for specified industries whose tariffs were left unchanged. Overall, the Kennedy Round reduced average tariffs by about 35%. The so-called Tokyo round of trade negotiations (completed in 1979) resulted in:
- Reduced tariffs  
- New codes for controlling the proliferation of nontariff barriers, such as VER’s.

An eighth round of negotiations, the so-called Uruguay Round, was competed in 1994.

The Uruguay Round  
Its most important results are:
Trade Liberalization

The average tariff imposed by advanced countries decreased by almost 40%. More important is the move to liberalize trade in two important sectors: agricultural and clothing.

From the GATT to the WTO

Much of the publicity surrounding the Uruguay Round focused on its creation of the WTO.

How different is the WTO from the GATT?

The GATT was a provisional agreement, while the WTO is a full-fledged international organization. The GATT applied only to trade in goods, while the WTO included rules on trade in services (the General Agreement on Trade in Services (GATS)) and on international application of intellectual property rights. The WTO has a new “dispute settlement” procedure which is designed to reach judgments in a much shorter time.

Benefits and Costs

The economic impact of the Uruguay Round is difficult to estimate. However, estimates of the GATT and of the Organization for Economic Cooperation and Development suggest a gain to the world economy as a whole of more than $200 billion annually once the agreement is fully in force. Most economists believe that these estimates are too low. The costs of the Uruguay Round will be felt by well-organized groups, while much of the benefit will accrue to diffuse populations.

Preferential Trading Agreements

Nations establish preferential trading agreements under which they lower tariffs with respect to each other but not the rest of the world. The GATT-WTO, through the principle of non-discrimination called the “most favored nation” (MFN) principle, prohibits such agreements. The formation of preferential trading agreements is allowed if they lead to free trade between the agreeing countries.

Free trade can be established among several WTO members as follows:

1. A free trade area allows free trade among members, but each member can have its own trade policy towards non-member countries. Example: The North American Free Trade Agreement (NAFTA) creates a free trade area.
2. A customs union allows free trade among members and requires a common external trade policy towards non-member countries. –Example: The European Union (EU) is a full customs union.
3. A common market is a customs union with free factor movements (especially labor) among members.

Are preferential trading agreements good?

It depends on whether it leads to trade creation or trade diversion.

Trade creation

Occurs when the formation of a preferential trading agreement leads to replacement of high-cost domestic production by low-cost imports from other members.

Trade diversion

Occurs when the formation of a preferential trading agreement leads to the replacement of low-cost imports from non members with higher-cost imports from member nations.

Summary

There are three arguments in favor of free trade:

1. The efficiency gains from free trade
2. The additional gains from economies of scale
3. The political argument

There are two arguments for deviating from free trade:

1. The terms of trade argument for a tariff
2. The domestic market failures

In practice, trade policy is dominated by considerations of income distribution. Political parties adopt policies that serve the interests of the median voter. Groups that are well organized (or small groups) are often able to get policies that serve their interests at the expense of the majority. International negotiation helps reduce tariffs in industrial countries and avoid trade wars.

The GATT is the central institution of the international trading system. The most recent worldwide GATT agreement also sets up a new organization, the WTO. Three kinds of preferential trading agreements are allowed under the WTO: free trade areas, customs unions, and common markets. Preferential trading agreements can be good or bad depending on the magnitude of trade creation and trade diversion.

Appendix: Proving that the Optimum Tariff is Positive

Figure 9A-1: Effects of a Tariff on Prices

Figure 9A-2: Welfare Effects of a Tariff

Import-Substituting Industrialization

From World War II until the 1970s many developing countries attempted to accelerate their development by limiting imports of manufactured goods to foster a manufacturing sector serving the domestic market. The most important economic argument for protecting manufacturing industries is the infant industry argument.

The Infant Industry Argument

It states that developing countries have a potential comparative advantage in manufacturing and they can realize that potential through an initial period of protection. It implies that it is a good idea to use tariffs or import quotas as temporary measures to get industrialization started. Example: The U.S. and Germany had high tariff rates on manufacturing in the 19th century, while Japan had extensive import controls until the 1970s.

Table 10-1: Gross Domestic Product Per Capita, 1999 (dollars)

<table>
<thead>
<tr>
<th>Country</th>
<th>GDP per Capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>33,900</td>
</tr>
<tr>
<td>Japan</td>
<td>23,400</td>
</tr>
<tr>
<td>Germany</td>
<td>22,700</td>
</tr>
<tr>
<td>Singapore</td>
<td>27,800</td>
</tr>
<tr>
<td>South Korea</td>
<td>13,200</td>
</tr>
<tr>
<td>Mexico</td>
<td>8,500</td>
</tr>
<tr>
<td>China</td>
<td>3,800</td>
</tr>
<tr>
<td>India</td>
<td>1,800</td>
</tr>
</tbody>
</table>

Problems with the Infant Industry Argument

There is a great diversity among the developing countries in terms of their income per capita. Why are some countries so much poorer than others? For about 30 years after World War II trade policies in many developing countries were strongly influenced by the belief that key to economic development was creation of a strong manufacturing sector. The best way to create a strong manufacturing sector was by protecting domestic manufacturers from international competition.
It is not always good to try to move today into the industries that will have a comparative advantage in the future. Example: In the 1980s South Korea became an exporter of automobiles, whereas in the 1960s its capital and skilled labor were still very scarce.

Protecting manufacturing does no good unless the protection itself helps make industry competitive. Example: Pakistan and India have protected their heavy manufacturing sectors for decades and have recently begun to develop significant exports of light manufactures like textiles.

Market Failure Justifications for Infant Industry Protection
Two market failures are identified as reasons why infant industry protection may be a good idea:

1. Imperfect capital markets justification
2. Appropriability argument

Firms in a new industry generate social benefits for which they are not compensated (e.g., start-up costs of adapting technology).

Import-Substituting Industrialization
Promoting Manufacturing Through Protection
Import-substituting industrialization

The strategy of encouraging domestic industry by limiting imports of manufactured goods. Many less-developed countries have pursued this strategy. Has import-substituting industrialization promoted economic development? Many economists are now harshly critical of the results of import substitution, arguing that it has fostered high-cost, inefficient production.

Why not encourage both import substitution and exports?
A tariff that reduces imports also necessarily reduces exports. Until the 1970s many developing countries were skeptical about the possibility of exporting manufactured goods. In many cases, import-substituting industrialization policies dovetailed naturally with existing political biases.

Table 10-2: Exports as a Percentage of National Income, 1999

<table>
<thead>
<tr>
<th>Country</th>
<th>Export Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>8</td>
</tr>
<tr>
<td>India</td>
<td>11</td>
</tr>
<tr>
<td>United States</td>
<td>12</td>
</tr>
<tr>
<td>Japan</td>
<td>11</td>
</tr>
<tr>
<td>Germany</td>
<td>27</td>
</tr>
<tr>
<td>South Korea</td>
<td>42</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>132</td>
</tr>
<tr>
<td>Singapore</td>
<td>202</td>
</tr>
</tbody>
</table>

Results of Favoring Manufacturing: Problems of Import-Substituting Industrialization

Many countries that have pursued import substitution have not shown any signs of catching up with the advanced countries. Example: In India, after 20 years of economic plans between the early 1950s and the early 1970s, its per capita income was only a few percent higher than before. Why didn’t import-substituting industrialization work the way it was supposed to? – The infant industry argument was not as universally valid as many people assumed.

Import-substituting industrialization generated:
- High rates of effective protection
- Inefficient scale of production
- Higher income inequality and unemployment

Import-Substituting Industrialization

Table 10-3: Effective Protection of Manufacturing in Some Developing Countries (percent)

<table>
<thead>
<tr>
<th>Country</th>
<th>Effective Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mexico (1960)</td>
<td>26</td>
</tr>
<tr>
<td>Philippines (1965)</td>
<td>61</td>
</tr>
<tr>
<td>Brazil (1966)</td>
<td>113</td>
</tr>
<tr>
<td>Chile (1961)</td>
<td>182</td>
</tr>
<tr>
<td>Pakistan (1963)</td>
<td>271</td>
</tr>
</tbody>
</table>

Problems of the Dual Economy

Most developing countries are characterized by economic dualism. A high-wage, capital-intensive industrial sector coexists with a low-wage, traditional sector. Dualism is associated with trade policy for two reasons: Dualism is probably a sign of markets working poorly (market failure case for deviating from free trade). The creation of the dual economy (an economy that is characterized by economic dualism) has been helped by import-substitution policies.

The Symptoms of Dualism

The Symptoms of Dualism

The Harris-Todaro model

It links rural-urban migration and unemployment that undermines the case for favoring manufacturing employment, even though manufacturing does offer higher wages. Countries with highly dualistic economies also seem to have a great deal of urban unemployment. An increase in the number of manufacturing jobs will lead to a rural-urban migration so large that urban unemployment actually rises. It helps the wage differentials argument to be in disfavor with economists.

Trade Policy as a Cause of Economic Dualism

Trade policy has been accused both of:
- Widening the wage differential between manufacturing and agriculture
- Fostering excessive capital intensity

Wage differentials are viewed as:
- A natural market response
- The monopoly power of unions whose industries are sheltered by import quotas from foreign competition

Export-Oriented Industrialization: the East Asian Miracle

From the mid-1960s onward, exports of manufactured goods, primarily to advanced nations, was another possible path to industrialization for the developing countries.

High performance Asian economies (HPAEs)

A group of countries that achieved spectacular economic growth. In some cases, they achieved economic growth of more than 10% per year.

The Facts of Asian Growth

The World Bank’s definition of HPAEs contains three groups of countries, whose “miracle” began at different times:
- Japan (after World War II)
- The four “tigers”: Hong Kong, Taiwan, South Korea, and Singapore (in the 1960s)
- Malaysia, Thailand, Indonesia, and China (in the late 1970s and the 1980s)

The HPAEs are very open to international trade.
Example: In 1999, exports as a share of gross domestic product in the case of both Hong Kong and Singapore exceeded 100% of GDP (132 and 202 respectively).

Export-Oriented Industrialization: the East Asian Miracle

Trade Policy in the HPAEs

Some economists argue that the “East Asian miracle” is the payoff to the relatively open trade regime. The data in Table 10-4 suggests that the HPAEs have been less protectionist than other, less developing countries, but they have by no means followed a policy of complete free trade. Low rates of protection in the HPAEs helped them to grow, but they are only a partial explanation of the “miracle.”

Table 10-4: Average Rates of Protection, 1985 (percent)
CHAPTER 11
CONTROVERSIES IN TRADE POLICY

Two controversies over international trade arose in the 1980s and 1990s. In the 1980s a new set of sophisticated arguments for government intervention in trade emerged in advanced countries. These arguments focused on the “high-technology” industries that came to prominence as a result of the rise of the silicon chip. In the 1990s a dispute arose over the effects of growing international trade on workers in developing countries.

Sophisticated Arguments for Activist Trade Policy

There are two kinds of market failure that seem to be present and relevant to the trade policies of advanced countries:

1. Technological externalities
2. The presence of monopoly profits in highly concentrated oligopolistic industries

Technology and Externalities

Externalities
Firms in an industry generate knowledge that other firms can also use without paying for it. In high-tech industries firms face appropriability problems. Example: In electronics, it is common for firms to “reverse engineer” their rivals’ designs.

The Case for Government Support of High-Technology Industries
Subsidize the activity with externalities, not all activities in an industry. For instance, R&D (as opposed to manufacturing) should be subsidized.

How Important Are Externalities?
Externalities are hard to measure empirically. Problems of appropriability at the level of the nation(as opposed to the firm) are less severe but still important even for a nation as large as the United States.

Imperfect Competition and Strategic Trade Policy
In some industries where there are only a few firms in effective competition. The assumptions of perfect competition will not apply. Firms will make excess returns(profits). There will be an international competition over the excess returns. A subsidy from the government to domestic firms can shift the excess returns from foreign to domestic firms.

The Brander-Spencer Analysis: An Example

There are only two firms (Boeing and Airbus) competing, each from a different country (United States and Europe). There is a new product, 150-seat aircraft, that both firms are capable of making. Each firm decides either to produce the new product or not.

Table 11-1: Two-Firm Competition

<table>
<thead>
<tr>
<th>Firm</th>
<th>Produce</th>
<th>Don’t produce</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boeing</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Airbus</td>
<td>0</td>
<td>125</td>
</tr>
</tbody>
</table>

Equilibrium outcome is A=0 and B=125; Boeing produces and Airbus does not.

A subsidy of 25 to Airbus given by Europe results in A=125, B=0.

Problems with the Brander-Spencer Analysis

Insufficient information to use the theory effectively. The exact payoffs of the firms cannot easily be obtained. Industries in isolation, A policy that succeeds in giving U.S. firms a strategic advantage in one industry will tend to cause strategic disadvantage elsewhere. Foreign retaliation, Strategic policies are beggar-thy-neighbor policies that increase our welfare at other countries’ expense.

Table 11-3: Two-Firm Competition: An Alternative Case

<table>
<thead>
<tr>
<th>Firm</th>
<th>Produce</th>
<th>Don’t produce</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boeing</td>
<td>125</td>
<td>0</td>
</tr>
<tr>
<td>Airbus</td>
<td>0</td>
<td>5</td>
</tr>
</tbody>
</table>

Equilibrium outcome is A=0 and B=125; Boeing produces and Airbus does not.

A subsidy of 25 to Airbus given by Europe results in A=5, B=5.

Globalization and Low-Wage Labor
The rise of manufactured exports from developing countries is one of the major shifts in the world economy over the last generation. The workers who produce these goods are paid low wages and work under poor conditions.

The Anti-Globalization Movement
It became a highly visible presence chronologically:

1980s
Alleged threat of competition from Japan in the United States

Early 1990s
Substantial concern in both the United States and Europe over the effects of imports from low-wage countries on the wages of less-skilled workers at home.

Second half of the 1990s
Alleged harm that world trade was doing to workers in the developing countries.

1999
Demonstrations disrupted the meeting of the World Trade Organization in Seattle.

Trade and Wages Revisited
Activists argue that globalization makes workers in developing-country export industries worse off. Example: Wages in Mexico’s maquiladoras were below $5 per day, and conditions were appalling by U.S. standards. Economists argue that despite the low wages earned by workers in developing countries, those workers are better off than they would be if globalization had not taken place.

Table 11-5: Real Wages

<table>
<thead>
<tr>
<th></th>
<th>High-tech goods/hour</th>
<th>Low-tech goods/hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Mexico</td>
<td>1/8</td>
<td>1/2</td>
</tr>
</tbody>
</table>

Labor Standards and Trade Negotiations
International trade agreements can improve wages and working conditions in poor countries by incorporating a system that monitors wages and working conditions and makes the results of this monitoring available to consumers.

Formal labor standards
They are conditions that export industries are supposed to meet as part of trade agreements. They have considerable political support in advanced countries. They are strongly opposed by most developing countries.

Globalization and Low-Wage Labor

Environmental and Cultural Issues
Environmental standards in developing-country export industries are much lower than in advanced-country industries. The incorporation of environmental standards in trade agreements can cause:

- Improvements in the environment
- Potential export industries in poor countries to shut down

Globalization has led to a homogenization of cultures around the world. Example: McDonald’s is now found almost everywhere.

The WTO and National Independence
Free trade and free flow of capital has undermined national sovereignty. WTO monitors not only the traditional instruments of trade policy, but also domestic policies that are de facto trade policies.

Summary
New arguments for government intervention in trade emerged in the 1980s and 1990s. In the 1980s the new theory of strategic trade policy offered reasons why countries might gain from promoting particular industries. In the 1990s a new critique of globalization emerged, focused on the effects of globalization on workers in developing countries.

There are two sophisticated arguments for activist trade policies:
1. Governments should promote industries that yield technological externalities.
2. Brander-Spencer analysis.

With the rise of manufactured exports from developing countries, a new movement opposed to globalization has emerged. Low wages paid to export workers.

CHAPTER 12
NATIONAL INCOME ACCOUNTING AND THE BALANCE OF PAYMENTS

Microeconomics
It studies the effective use of scarce resources from the perspective of individual firms and consumers.

Macroeconomics
It studies how economies’ overall levels of employment, production, and growth are determined. It emphasizes four aspects of economic life:

- Unemployment
- Saving
- Trade imbalances
- Money and the price level

The national income accounts and the balance of payments accounts are essential tools for studying the macroeconomics of open, interdependent economies.

National income accounting
Records all the expenditures that contribute to a country’s income and output

Balance of payments accounting
Helps keep track of both changes in a country’s indebtedness to foreigners and the fortunes of its export-and import-competing industries.

Introduction

The National Income Accounts

Gross national product (GNP)
The value of all final goods and services produced by a country’s factors of production and sold on the market in a given time period. It is the basic measure of a country’s output. GNP is calculated by adding up the market value of all expenditures on final output:

1. Consumption: The amount consumed by private domestic residents
2. Investment: The amount put aside by private firms to build new plant and equipment for future production
3. Government purchases: The amount used by the government
4. Current account balance: The amount of net exports of goods and services to foreigners

Figure 12-1: U.S. GNP and Its Components, 2000

National Product and National Income
National Income
It is earned over a period by its factors of production. It must equal the GNP a country generates over some period of time. One person’s spending is another’s income (i.e., total spending must equal total income).

Capital Depreciation, International Transfers, and Indirect Business Taxes

Adjustments to the definition of GNP:
Depreciation of capital
– It reduces the income of capital owners.
– It must be subtracted from GNP (to get the net national product).

Net unilateral transfers of income
– They are a country’s income but are not part of its product.
– They must be added to the net national product.

Indirect business taxes
– They are sales taxes.
– They must be subtracted from GNP.

Gross Domestic Product (GDP)
It measures the volume of production within a country’s borders. It equals GNP minus net receipts of factor income from the rest of the world. It does not correct for the portion of countries’ production carried out using services provided by foreign-owned capital.

1. Consumption: The portion of GNP purchased by the private sector to fulfill current wants
2. Investment: The part of output used by private firms to produce future output
3. Government Purchases: Any goods and services purchased by federal, state, or local governments

The National Income Identity for an Open Economy

It is the sum of domestic and foreign expenditure on the goods and services produced by domestic factors of production:

\[ Y = C + I + G + EX - IM \]  \hfill (12-1)

where:
- \( Y \) is GNP
- \( C \) is consumption
- \( I \) is investment
- \( G \) is government purchases
- \( EX \) is exports
- \( IM \) is imports

In a closed economy,

\[ EX = IM = 0. \]

An Imaginary Open Economy

Assumptions of the model:

There is an economy, Agraria, that can only produce wheat. Each citizen of Agraria is both a consumer and a farmer of wheat. The Agrarian government appropriates part of the crop to feed its army. Agraria can import milk from the rest of the world in exchange for exports of wheat. – The price of milk is 0.5 bushel of wheat per gallon, and at this price Agrarians want to consume 40 gallons of milk.

The Current Account and Foreign Indebtedness

Current account (CA) balance

The difference between exports of goods and services and imports of goods and services \( (CA = EX - IM) \).

A country has a CA surplus when its \( CA > 0 \).

A country has a CA deficit when its \( CA < 0 \).

CA measures the size and direction of international borrowing. – A country’s current account balance equals the change in its net foreign wealth.

CA balance is equal to the difference between national income and domestic residents’ spending:

\[ Y = (C + I + G) = CA \]

CA balance is goods production less domestic demand. CA balance is the excess supply of domestic financing. Example: Agraria imports 20 bushels of wheat and exports only 10 bushels of wheat (Table 12-1). The current account deficit of 10 bushels is the value of Agraria’s borrowing from foreigners, which the country will have to repay in the future.

Saving and the Current Account

National saving (S)

The portion of output, \( Y \), that is not devoted to household consumption, \( C \), or government purchases, \( G \). It always equals investment in a closed economy. A closed economy can save only by building up its capital stock (\( S = \Delta K \)). An open economy can save either by building up its capital stock or producing future output (\( S = (I + CA) \)). A country’s CA surplus is referred to as its net foreign investment.

Private saving (Sp)

The part of disposable income that is saved rather than consumed.

\[ Sp = I + CA - Sg = I + CA - (T - G) = I + CA - (G - T) \]  \hfill (12-2)

T is the government’s “income” (its net tax revenue)

Sg (government savings (T - G))

Government budget deficit (G - T)

The Balance of Payments Accounts

A country’s balance of payments accounts keep track of both its payments to and its receipts from foreigners. Every international transaction automatically enters the balance of payments twice: once as a credit (+) and once as a debit (-).

Three types of international transactions are recorded in the balance of payments:

1. Exports or imports of goods or services
2. Purchases or sales of financial assets
3. Transfers of wealth between countries. They are recorded in the capital account.

Examples of Paired Transactions

A U.S. citizen buys a $1000 typewriter from an Italian company, and the Italian company deposits the $1000 in its account at Citibank in New York. That is, the U.S. trades assets for goods. This transaction creates the following two offsetting entries in the U.S. balance of payments:

- It enters the U.S. CA with a negative sign (-$1000).
- It shows up as a $1000 credit in the U.S. financial account.

A U.S. citizen pays $200 for dinner at a French restaurant in France by charging his Visa credit card. That is, the U.S. trades assets for services. This transaction creates the following two offsetting entries in the U.S. balance of payments:

- It enters the U.S. CA with a negative sign (-$200).
- It shows up as a $200 credit in the U.S. financial account.

A U.S. citizen buys a $95 newly issued share of stock in the United Kingdom oil giant British Petroleum (BP) by using a check drawn on his stockbroker money market account. BP deposits the $95 in its own U.S. bank account at Second Bank of Chicago. That is, the U.S. trades assets for assets. This transaction creates the following two offsetting entries in the U.S. balance of payments:

- It enters the U.S. financial account with a negative sign (-$95).
- It shows up as a $95 credit in the U.S. financial account.

A U.S. bank forgives $5000 in debt owed to it by the government of Bygonia. This transaction creates the following two offsetting entries in the U.S. balance of payments:

- It enters the U.S. capital account with a negative sign (-$5000).
- It shows up as a $5000 credit in the U.S. financial account.

The Fundamental Balance of Payments Identity

Any international transaction automatically gives rise to two offsetting entries in the balance of payments resulting in a fundamental identity:

\[ \text{Current account} + \text{financial account} = 0 \]  \hfill (12-3)

Table 12-2: U.S. Balance of Payments Accounts for 2000 (billions of dollars)

<table>
<thead>
<tr>
<th>Type of Transaction</th>
<th>Credits</th>
<th>Debits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Exports</td>
<td>+1,414.9</td>
<td></td>
</tr>
<tr>
<td>Merchandise</td>
<td>+773.3</td>
<td></td>
</tr>
<tr>
<td>Services</td>
<td>+296.2</td>
<td></td>
</tr>
<tr>
<td>Income receipts</td>
<td>+345.4</td>
<td></td>
</tr>
<tr>
<td>2. Imports</td>
<td>-1,797.1</td>
<td></td>
</tr>
<tr>
<td>Merchandise</td>
<td>-1,222.8</td>
<td></td>
</tr>
<tr>
<td>Services</td>
<td>-215.2</td>
<td></td>
</tr>
<tr>
<td>Income payments</td>
<td>-380.1</td>
<td></td>
</tr>
<tr>
<td>3. Net unilateral transfers</td>
<td>-53.2</td>
<td></td>
</tr>
<tr>
<td>Balance on current account</td>
<td>-435.4</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Credits</td>
<td>+1,414.9</td>
<td>-1,797.1</td>
</tr>
<tr>
<td>Debits</td>
<td>-583.3</td>
<td></td>
</tr>
</tbody>
</table>

Financial Account

(5) U.S. assets held abroad (increase +)

<table>
<thead>
<tr>
<th>Type of Transaction</th>
<th>Credits</th>
<th>Debits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Official reserve assets</td>
<td>+352.4</td>
<td></td>
</tr>
<tr>
<td>Other assets</td>
<td>+941.5</td>
<td></td>
</tr>
<tr>
<td>Balance on financial account</td>
<td>+396.1</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Credits</td>
<td>+352.4</td>
<td>-941.5</td>
</tr>
<tr>
<td>Debits</td>
<td>-589.0</td>
<td></td>
</tr>
</tbody>
</table>

Statistical discrepancy (sum of (1) through (5) with sign reversed)

+53.8

Slide 12-427

Muhammad Firman  (University of Indonesia - Accounting)

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The balance of payments accounts divide exports and imports into three categories:

1. Merchandise trade: Exports or imports of goods
2. Services: Payments for legal assistance, tourists' expenditures, and shipping fees
3. Income: International interest and dividend payments and the earnings of domestically owned firms operating abroad

The Capital Account
It records asset transfers and tends to be small for the United States.

The Financial Account
It measures the difference between sales of assets to foreigners and purchases of assets located abroad.

- Financial inflow (capital inflow): A loan from the foreigners with a promise that they will be repaid
- Financial outflow (capital outflow): A transaction involving the purchase of an asset from foreigners

The Statistical Discrepancy
Data associated with a given transaction may come from different sources that differ in coverage, accuracy, and timing. This makes the balance of payments accounts seldom balance in practice. Account keepers force the two sides to balance by adding to the accounts a statistical discrepancy. It is very difficult to allocate this discrepancy among the current, capital, and financial accounts.

Official Reserve Transactions
- Central bank: The institution responsible for managing the supply of money
- Official international reserves: Foreign assets held by central banks as a cushion against national economic misfortune
- Official foreign exchange intervention: Central banks often buy or sell international reserves in private asset markets to affect macroeconomic conditions in their economies.

Official settlements balance (balance of payments)
The book-keeping offset to the balance of official reserve transactions. It is the sum of the current account balance, the capital account balance, the nonreserve portion of the financial account balance, and the statistical discrepancy. Example: The U.S. balance of payments in 2000 was -$35.6 billion, that is, the balance of official reserve transactions with its sign reversed. A country with a negative balance of payments may signal that it is running down its international reserve assets or incurring debts to foreign monetary authorities.

Table 12-3: Calculating the U.S. Official Settlements Balance for 2000 (billions of dollars)

<table>
<thead>
<tr>
<th>Current Account</th>
<th>Credits</th>
<th>Debits</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Exports</td>
<td>+1,414.9</td>
<td></td>
</tr>
<tr>
<td>(2) Imports</td>
<td></td>
<td>-1,797.1</td>
</tr>
<tr>
<td>(3) Net unilateral transfers</td>
<td>-53.2</td>
<td></td>
</tr>
<tr>
<td>(4) Balance on current account</td>
<td></td>
<td>-435.4</td>
</tr>
<tr>
<td>(3) + (4)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nonreserve financial account</th>
</tr>
</thead>
<tbody>
<tr>
<td>(5) U.S. assets held abroad</td>
</tr>
<tr>
<td>(6) Foreign assets held in U.S.</td>
</tr>
<tr>
<td>(7) Foreign reserves held in U.S.</td>
</tr>
<tr>
<td>(8) Balance on nonreserve financial account</td>
</tr>
<tr>
<td>(9) Statistical discrepancy</td>
</tr>
<tr>
<td>(10) Official settlements balance</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Official reserve transactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>(11) U.S. official reserves held abroad</td>
</tr>
<tr>
<td>(12) Foreign official reserves held in U.S.</td>
</tr>
</tbody>
</table>

Example: The U.S. balance of payments in 2000 was -$35.6 billion, that is, the balance of official reserve transactions with its sign reversed. A country with a negative balance of payments may signal that it is running down its international reserve assets or incurring debts to foreign monetary authorities.
Summary
A country's GNP is equal to the income received by its factors of production. GDP is equal to GNP less net receipts of factor income from abroad, measures the output produced within a country's territorial borders. In a closed economy, GNP must be consumed, invested, or purchased by the government. In an open economy, GNP equals the sum of consumption, investment, government purchases, and net exports of goods and services.

All transactions between a country and the rest of the world are recorded in its balance of payments accounts. The current account equals the country's net lending to foreigners. National saving equals domestic investment plus the current account. Transactions involving goods and services appear in the current account of the balance of payments, while international sales or purchases of assets appear in the financial account.

The capital account records asset transfers and tends to be small in the United States. Any current account deficit must be matched by an equal surplus in the other two accounts of the balance of payments, and any current account surplus by a deficit somewhere else. International asset transactions carried out by central banks are included in the financial account.

CHAPTER 13
EXCHANGE RATES AND THE FOREIGN EXCHANGE MARKETS AN ASSET APPROACH

Introduction
Exchange rates are important because they enable us to translate different countries' prices into comparable terms. Exchange rates are determined in the same way as other asset prices. The general goal of this chapter is to show:
- How exchange rates are determined
- The role of exchange rates in international trade

Exchange Rates and International Transactions
An exchange rate can be quoted in two ways:
Direct: The price of the foreign currency in terms of dollars
Indirect: The price of dollars in terms of the foreign currency

Domestic and Foreign Prices
If we know the exchange rate between two countries' currencies, we can compute the price of one country's exports in terms of the other country's money. Example: The dollar price of a £50 sweater with a dollar exchange rate of $1.50 per pound is (1.50 $/£) x (£50) = $75.

Two types of changes in exchange rates:
Depreciation of home country's currency
A rise in the home currency prices of a foreign currency. It makes home goods cheaper for foreigners and foreign goods more expensive for domestic residents.

Appreciation of home country's currency
A fall in the home price of a foreign currency. It makes home goods more expensive for foreigners and foreign goods cheaper for domestic residents.

Exchange Rates and International Transactions
Exchange Rates and Relative Prices
Import and export demands are influenced by relative prices.

Appreciation of a country's currency:
- Raises the relative price of its exports
- Lowers the relative price of its imports

Depreciation of a country's currency:
- Lowers the relative price of its exports
- Raises the relative price of its imports

Table 13-2: $/£ Exchange Rates and the Relative Price of American Designer Jeans and British Sweaters

<table>
<thead>
<tr>
<th>Exchange rate ($/£)</th>
<th>Relative price (pairs of jeans/sweater)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.25</td>
<td>1.50</td>
</tr>
<tr>
<td>1.50</td>
<td>1.75</td>
</tr>
<tr>
<td>1.75</td>
<td>1.94</td>
</tr>
</tbody>
</table>

The Foreign Exchange Market
Exchange rates are determined in the foreign exchange market. The market in which international currency trades take place

The Actors
The major participants in the foreign exchange market are:
- Commercial banks
- International corporations
- Nonbank financial institutions
- Central banks

Interbank trading
Foreign currency trading among banks. It accounts for most of the activity in the foreign exchange market.

Exchange Rates and International Transactions

Characteristics of the Market
The worldwide volume of foreign exchange trading is enormous, and it has ballooned in recent years. New technologies, such as Internet links, are used among the major foreign exchange trading centers (London, New York, Tokyo, Frankfurt, and Singapore). The integration of financial centers implies that there can be no significant arbitrage. The process of buying a currency cheap and selling it dear.

Vehicle currency
A currency that is widely used to denominate international contracts made by parties who do not reside in the country that issues the vehicle currency. Example: In 2001, around 90% of transactions between banks involved exchanges of foreign currencies for U.S. dollars.

Spot Rates and Forward Rates
The returns on deposits traded in the foreign exchange market depend on interest rates and expected exchange rate changes. In order to decide whether to buy a euro or a dollar deposit, one must calculate the dollar return on a euro deposit.

A Simple Rule
The dollar rate of return on euro deposits is approximately the euro interest rate plus the rate of depreciation of the dollar against the euro. The rate of depreciation of the dollar against the euro is the percentage increase in the dollar/euro exchange rate over a year. The expected rate of return difference between dollar and euro deposits is:

$$ R_S - [R_D + (E^{*}_€ - E_S)/E_S] = R_S - R_D - (E^{*}_€ - E_S)/E_S \quad (13-1) $$

where:
- $ R_S $ = interest rate on one-year dollar deposits
- $ R_D $ = today’s interest rate on one-year euro deposits
- $ E_S/E € $ = today's dollar/euro exchange rate (number of dollars per euro)
- $ E^{*}_€/E_S $ = dollar/euro exchange rate (number of dollars per euro) expected to prevail a year from today

When the difference in Equation (13-1) is positive, dollar deposits yield the higher expected rate of return. When it is negative, euro deposits yield the higher expected rate of return.

### Table 13-3: Comparing Dollar Rates of Return on Dollar and Euro Deposits

<table>
<thead>
<tr>
<th>Case</th>
<th>$ R_D $</th>
<th>$ R_S $</th>
<th>$ E^{*}_€ - E_S $</th>
<th>$ E_S $</th>
<th>$ R_S - R_D - (E^{*}_€ - E_S)/E_S $</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.10</td>
<td>0.06</td>
<td>0.09</td>
<td>0.04</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0.10</td>
<td>0.06</td>
<td>0.04</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0.10</td>
<td>0.06</td>
<td>0.08</td>
<td>-0.04</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0.10</td>
<td>0.12</td>
<td>-0.04</td>
<td>0.02</td>
<td></td>
</tr>
</tbody>
</table>

### Return, Risk, and Liquidity in the Foreign Exchange Market

The demand for foreign currency assets depends not only on returns but on risk and liquidity. There is no consensus among economists about the importance of risk in the foreign exchange market. Most of the market participants that are influenced by liquidity factors are involved in international trade. Payments connected with international trade make up a very small fraction of total foreign exchange transactions. Therefore, we ignore the risk and liquidity motives for holding foreign currencies.

### Equilibrium in the Foreign Exchange Market

The foreign exchange market is in equilibrium when deposits of all currencies offer the same expected rate of return.

#### Interest parity condition

The expected returns on deposits of any two currencies are equal when measured in the same currency. It implies that potential holders of foreign currency deposits view them all as equally desirable assets. The expected rates of return are equal when:

$$ R_S = R_D + (E^{*}_€ - E_S)/E_S \quad (13-2) $$

#### How Changes in the Current Exchange Rate Affect Expected Returns

Depreciation of a country’s currency today lowers the expected domestic currency return on foreign currency deposits. Appreciation of the domestic currency today raises the domestic currency return expected of foreign currency deposits.

### Table 13-4: Today’s Dollar/Euro Exchange Rate and the Expected Dollar Return on Euro Deposits When Ee$/E = $1.05 per Euro

<table>
<thead>
<tr>
<th>Today’s Dollar/Euro Exchange Rate</th>
<th>Expected Dollar Depreciation Rate against Euro</th>
<th>Expected Dollar Return on Euro Deposits</th>
</tr>
</thead>
<tbody>
<tr>
<td>$ E_{ST} $</td>
<td>$ R_D $</td>
<td>$ 1.05 - E_{ST} $</td>
</tr>
<tr>
<td>1.07</td>
<td>0.05</td>
<td>-0.019</td>
</tr>
<tr>
<td>1.05</td>
<td>0.05</td>
<td>-0.009</td>
</tr>
<tr>
<td>1.03</td>
<td>0.05</td>
<td>-0.019</td>
</tr>
<tr>
<td>1.02</td>
<td>0.05</td>
<td>0.029</td>
</tr>
<tr>
<td>1.00</td>
<td>0.05</td>
<td>0.010</td>
</tr>
</tbody>
</table>

### Exchange Rates and Asset Returns

Spot and forward exchange rates tend to move in a highly correlated fashion.

#### Foreign Exchange Swaps

Spot sales of a currency combined with a forward repurchase of the currency. They make up a significant proportion of all foreign exchange trading.

#### Futures and Options

Futures contract: The buyer buys a promise that a specified amount of foreign currency will be delivered on a specified date in the future.

### The Real Rate of Return

The rate of return computed by measuring asset values in terms of some broad representative basket of products that savers regularly purchase.

#### Risk and Liquidity

Savers care about two main characteristics of an asset other than its return:
- Risk: The variability it contributes to savers’ wealth
- Liquidity: The ease with which it can be sold or exchanged for goods

### Market participants need two pieces of information in order to compare returns on different deposits:

- How the money values of the deposits will change
- How exchange rates will change

A currency’s interest rates are the amount of that currency an individual can earn by lending a unit of the currency for a year. Example: At a dollar interest rate of 10% per year, the lender of $1 receives $1.10 at the end of the year.

### Table 13-2: Interest Rates on Dollar and Deutschmark Deposits, 1975-1998

<table>
<thead>
<tr>
<th>Year</th>
<th>Interest Rate on Dollar Deposits</th>
<th>Interest Rate on Deutschmark Deposits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>1976</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>1977</td>
<td>0.03</td>
<td>0.03</td>
</tr>
<tr>
<td>1978</td>
<td>0.04</td>
<td>0.04</td>
</tr>
<tr>
<td>1979</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>1980</td>
<td>0.06</td>
<td>0.06</td>
</tr>
<tr>
<td>1981</td>
<td>0.07</td>
<td>0.07</td>
</tr>
<tr>
<td>1982</td>
<td>0.08</td>
<td>0.08</td>
</tr>
<tr>
<td>1983</td>
<td>0.09</td>
<td>0.09</td>
</tr>
<tr>
<td>1984</td>
<td>0.10</td>
<td>0.10</td>
</tr>
<tr>
<td>1985</td>
<td>0.11</td>
<td>0.11</td>
</tr>
<tr>
<td>1986</td>
<td>0.12</td>
<td>0.12</td>
</tr>
<tr>
<td>1987</td>
<td>0.13</td>
<td>0.13</td>
</tr>
<tr>
<td>1988</td>
<td>0.14</td>
<td>0.14</td>
</tr>
<tr>
<td>1989</td>
<td>0.15</td>
<td>0.15</td>
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<tr>
<td>1990</td>
<td>0.16</td>
<td>0.16</td>
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<tr>
<td>1991</td>
<td>0.17</td>
<td>0.17</td>
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<tr>
<td>1992</td>
<td>0.18</td>
<td>0.18</td>
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<tr>
<td>1993</td>
<td>0.19</td>
<td>0.19</td>
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<tr>
<td>1994</td>
<td>0.20</td>
<td>0.20</td>
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<tr>
<td>1995</td>
<td>0.21</td>
<td>0.21</td>
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<tr>
<td>1996</td>
<td>0.22</td>
<td>0.22</td>
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<tr>
<td>1997</td>
<td>0.23</td>
<td>0.23</td>
</tr>
<tr>
<td>1998</td>
<td>0.24</td>
<td>0.24</td>
</tr>
</tbody>
</table>

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### Figure 13-3: The Relation Between the Current Dollar/Euro Exchange Rate and the Expected Dollar Return on Euro Deposits
An important category of foreign exchange trading is forward trading. The exchange rate is most appropriately thought of as being an asset price itself. The returns on deposits traded in the foreign exchange market depend on interest rates and expected exchange rate changes.

Equilibrium in the foreign exchange market requires interest parity. For given interest rates and a given expectation of the future exchange rate, the interest parity condition tells us the current equilibrium exchange rate. A rise in dollar (euro) interest rates causes the dollar to appreciate (depreciate) against the euro. Today’s exchange rate is altered by changes in its expected future level.

### CHAPTER 14

**MONEY, INTEREST RATES, AND EXCHANGE RATES**

**Introduction**

Factors that affect a country’s money supply or demand are among the most powerful determinants of its currency’s exchange rate against foreign currencies. This chapter combines the foreign-exchange market with the money market to determine the exchange rate in the short run. It analyzes the long-term effects of monetary changes on output prices and expected future exchange rates.

**Money Defined: A Brief Review**

1. Money as a Medium of Exchange: A generally accepted means of payment
2. Money as a Unit of Account: A widely recognized measure of value
3. Money as a Store of Value: A transfer of purchasing power from the present into the future

**What Is Money?**

Assets widely used and accepted as a means of payment. Money is very liquid, but pays little or no return. All other assets are less liquid but pay higher return.

**Money Supply (Ms):**

\[ Ms = \text{Currency} + \text{Checkable Deposits} \]

**How the Money Supply Is Determined**

An economy’s money supply is controlled by its central bank. The central bank:

- Directly regulates the amount of currency in existence
- Indirectly controls the amount of checking deposits issued by private banks

Three factors influence money demand:

1. Expected return
2. Risk
3. Liquidity

**Expected Return**

The interest rate measures the opportunity cost of holding money rather than interest-bearing bonds. A rise in the interest rate raises the cost of holding money and causes money demand to fall.

**Risk**

Holding money is risky. An unexpected increase in the prices of goods and services could reduce the value of money in terms of the commodities consumed. Changes in the risk of holding money need not cause individuals to reduce their demand for money. Any change in the riskiness of money causes an equal change in the riskiness of bonds.

**Liquidity**

The main benefit of holding money comes from its liquidity. Households and firms hold money because it is the easiest way of financing their everyday purchases. A rise in the average value of transactions carried out by a household or firm causes its demand for money to rise.

**Aggregate money demand**

The total demand for money by all households and firms in the economy. It is determined by three main factors:

1. Interest rate: It reduces the demand for money.
2. Price level: It raises the demand for money.
3. Real national income: It raises the demand for money.

The aggregate demand for money can be expressed by:

\[ Md = P \times L(R, Y) \quad (14-1) \]

where:

- \( P \) is the price level
- \( Y \) is real national income
- \( L(R, Y) \) is the aggregate real money demand

Equation (14-1) can also be written as:
The condition for equilibrium in the money market is:
\[ M_s = M_d \]  \hspace{1cm} (14-3)

The money market equilibrium condition can be expressed in terms of aggregate real money demand as:
\[ \frac{M_s}{P} = L(R,Y) \]  \hspace{1cm} (14-4)

Interest Rates and the Money Supply
An increase (fall) in the money supply lowers (raises) the interest rate, given the price level and output. The effect of increasing the money supply at a given price level is illustrated in Figure 14-4.

The Equilibrium Interest Rate: The Interaction of Money Supply and Demand
Figure 14-7: Money-Market/Exchange Rate Linkages

U.S. Money Supply and the Dollar/Euro Exchange Rate
An increase (decrease) in a country’s money supply causes its currency to depreciate (appreciate) in the foreign exchange market.

Figure 14-8: Effect on the Dollar/Euro Exchange Rate and Dollar Interest Rate of an Increase in the U.S. Money Supply

Europe’s Money Supply and the Dollar/Euro Exchange Rate
An increase in Europe’s money supply causes a depreciation of the euro (i.e., appreciation of the dollar). A reduction in Europe’s money supply causes an appreciation of the euro (i.e., a depreciation of the dollar). The change in the European money supply does not disturb the U.S. money market equilibrium.

Figure 14-9: Effect of an Increase in the European Money Supply

Money, the Price Level, and the Exchange Rate in the Long Run
Prices are perfectly flexible and always adjusted immediately to preserve full employment.

Money and Money Prices
The money market equilibrium (Equation 14-4) can be rearranged to give the long-run equilibrium price level:

$$P = \frac{M_s}{L(R,Y)}$$

An increase in a country’s money supply causes a proportional increase in its price level.

The Long-Run Effects of Money Supply Changes
A change in the supply of money has no effect on the long-run values of the interest rate or real output. A permanent increase in the money supply causes a proportional increase in the price level’s long-run value. This prediction is based on the money market equilibrium condition: $M_s/P=LorP = \frac{M_s}{L}$.

This condition implies that

$$\Delta P/P = \Delta M_s/M_s - \Delta U/L.$$

The inflation rate equals the monetary growth rate less the growth rate for money demand.

Empirical Evidence on Money Supplies and Price Levels
In a cross-section of countries, long-term changes in money supplies and price levels show a clear positive correlation.

Figure 14-10: Monetary Growth and Price-Level Change in the Seven Main Industrial Countries, 1973-1997

Money and the Exchange Rate in the Long Run
A permanent increase (decrease) in a country’s money supply causes a proportional long-run depreciation (appreciation) of its currency against foreign currencies.

Inflation and Exchange Rate Dynamics
Inflation: A situation where an economy’s price level rises.
Deflation: A situation where an economy’s price level falls.

Short-Run Price Rigidity versus Long-Run Price Flexibility
The short-run “stickiness” of price levels is illustrated in Figure 14-11.

Figure 14-11: Month-to-Month Variability of the Dollar/DM Exchange Rate and of the U.S./German Price-Level Ratio, 1974-2001

Inflation and Exchange Rate Dynamics
A change in the money supply creates demand and cost pressures that lead to future increases in the price level from three main sources:

1. **Shifts in Aggregate Demand:** An increase in money supply shifts the aggregate demand curve to the right, leading to higher prices.
2. **Shifts in Aggregate Supply:** An increase in money supply may also lead to increased production costs, shifting the aggregate supply curve to the left and raising prices.
3. **Expectations of Future Inflation:** If people expect future inflation, they may demand higher wages and prices today, leading to faster inflation in the long run.
Excess demand for output and labor
Inflationary expectations
Raw materials prices

Permanent Money Supply Changes and the Exchange Rate
How does the dollar/euro exchange rate adjust to a permanent increase in the U.S. money supply? Figure 14-12 shows both the short-run and long-run effects of the increase in the U.S. money supply.

Figure 14-12: Effects of an Increase in the U.S. Money Supply

Figure 14-13: Time Paths of U.S. Economic Variables After a Permanent Increase in the U.S. Money Supply

Exchange Rate Overshooting
The exchange rate is said to overshoot when its immediate response to a disturbance is greater than its long-run response. It helps explain why exchange rates move so sharply from day to day. It is a direct result of sluggish short-run price level adjustment and the interest parity condition.

Summary
Money is held because of its liquidity. Aggregate real money demand depends negatively on the opportunity cost of holding money and positively on the volume of transactions in the economy. The money market is in equilibrium when the real money supply equals aggregate real money demand. By lowering the domestic interest rate, an increase in the money supply causes the domestic currency to depreciate in the foreign exchange market.

Permanent changes in the money supply push the long-run equilibrium price level proportionally in the same direction. These changes do not influence the long-run values of output, the interest rate, or any relative prices. An increase in the money supply can cause the exchange rate to overshoot its long-run level in the short run.

CHAPTER 15
PRICE LEVELS AND THE EXCHANGE RATE IN THE LONG RUN

Introduction
The model of long-run exchange rate behavior provides the framework that actors in asset markets use to forecast future exchange rates. Predictions about long-run movements in exchange rates are important even in the short run. In the long run, national price levels play a key role in determining both interest rates and the relative prices at which countries’ products are traded. The theory of purchasing power parity (PPP) explains movements in the exchange rate between countries’ currencies by changes in the countries’ price levels.

The Law of One Price
Law of one price
Identical goods sold in different countries must sell for the same price when their prices are expressed in terms of the same currency. This law applies only in competitive markets free of transport costs and official barriers to trade. Example: If the dollar/pound exchange rate is $1.50 per pound, a sweater that sells for $45 in New York must sell for £30 in London. It implies that the dollar price of good i is the same wherever it is sold:

\[ P_{US} = \frac{P_{UK}}{E_{US/UK}} \]

where:
- \( P_{US} \) is the dollar price of good i when sold in the U.S.
- \( P_{UK} \) is the corresponding euro price in Europe
- \( E_{US/UK} \) is the dollar/euro exchange rate

Purchasing Power Parity
Theory of Purchasing Power Parity (PPP)
- The exchange rate between two counties’ currencies equals the ratio of the counties’ price levels.
- It compares average prices across countries.
- It predicts a dollar/euro exchange rate of:

\[ E_{US/UK} = \frac{P_{US}}{P_{UK}} \]

where:
- \( P_{US} \) is the dollar price of a reference commodity basket sold in the United States
- \( P_{EU} \) is the euro price of the same basket in Europe

By rearranging Equation (15-1), one can obtain:

\[ P_{US} = \frac{P_{UK}}{E_{US/UK}} \]

PPP asserts that all countries’ price levels are equal when measured in terms of the same currency.

The Relationship Between PPP and the Law of One Price
The law of one price applies to individual commodities, while PPP applies to the general price level. If the law of one price holds true for every commodity, PPP must hold automatically for the same reference baskets across countries. Proponents of the PPP theory argue that its validity does not require the law of one price to hold exactly.

Absolute PPP and Relative PPP
Absolute PPP
It states that exchange rates equal relative price levels.

Relative PPP
It states that the percentage change in the exchange rate between two currencies over any period equals the difference between the percentage changes in national price levels. Relative PPP between the United States and Europe would be:

\[ \frac{E_{US/UK} - E_{US/UK,t-1}}{E_{US/UK,t-1}} = \pi_{US,t} - \pi_{EU,t} \]

where:
- \( \pi \) = inflation rate

Monetary approach to the exchange rate
A theory of how exchange rates and monetary factors interact in the long run.

The Fundamental Equation of the Monetary Approach
Price levels can be expressed in terms of domestic money demand and supplies:

- In the United States:
  \[ P_{US} = M_{US}/L (R_g, Y_{US}) \]  
  (15-3)

- In Europe:
  \[ P_e = M_{EU}/L (R_e, Y_e) \]  
  (15-4)

The monetary approach makes a number of specific predictions about the long-run effects on the exchange rate of changes in:

- **Money supplies**
  An increase in the U.S. (European) money supply causes a proportional long-run depreciation (appreciation) of the dollar against the euro.

- **Interest rates**
  A rise in the interest rate on dollar (euro) denominated assets causes a depreciation (appreciation) of the dollar against the euro.

- **Output levels**
  A rise in U.S. (European) output causes an appreciation (depreciation) of the dollar against the euro.

**Ongoing Inflation, Interest Parity, and PPP**

Money supply growth at a constant rate eventually results in ongoing inflation (i.e., continuing rise in the price level) at the same rate. Changes in this long-run inflation rate do not affect the full-employment output level or the long-run relative prices of goods and services. The interest rate is not independent of the money supply growth rate in the long run. The international interest rate difference is the difference between expected national inflation rates:

\[ R_g - R_e = \pi_{US} - \pi^e \]  
(15-5)

**The Fisher Effect**

A rise (fall) in a country's expected inflation rate will eventually cause an equal rise (fall) in the interest rate that deposits of its currency offer. Figure 15-1 illustrates an example, where at time 0 the Federal Reserve unexpectedly increases the growth rate of the U.S. money supply to a higher level.

Figure 15-1: Long-Run Time Paths of U.S. Economic Variables after a Permanent Increase in the Growth Rate of the U.S. Money Supply

In this example, the dollar interest rate rises because people expect more rapid future money supply growth and dollar depreciation. The interest rate increase is associated with higher expected inflation and an immediate currency depreciation. Figure 15-2 confirms the main long-run prediction of the Fisher effect.

Figure 15-2: Inflation and Interest Rates in Switzerland, the United States, and Italy, 1970-2000

**Empirical Evidence on PPP and the Law of One Price**

The empirical support for PPP and the law of one price is weak in recent data. The prices of identical commodity baskets, when converted to a single currency, differ substantially across countries. Relative PPP is sometimes a reasonable approximation to the data, but it performs poorly.

Figure 15-3: The Dollar/DM Exchange Rate and Relative U.S./German Price Levels, 1964-2000

Explaining the Problems with PPP

The failure of the empirical evidence to support the PPP and the law of one price is related to:

1. Trade barriers and nontradables
2. Departures from free competition
3. International differences in price level measurement

**Trade Barriers and Nontradables**

Transport costs and governmental trade restrictions make trade expensive and in some cases create nontradable goods. The greater the transport costs, the greater the range over which the exchange rate can move.

**Departures from Free Competition**

When trade barriers and imperfectly competitive market structures occur together, linkages between national price levels are weakened further.

**Pricing to market**

When a firm sells the same product for different prices in different markets. It reflects different demand conditions in different countries. Example: Countries where demand is more price-inelastic will tend to be charged higher markups over a monopolistic seller’s production cost.

International Differences in Price Level Measurement
Government measures of the price level differ from country to country because people living in different counties spend their income in different ways.

**PPP in the Short Run and in the Long Run**

Departures from PPP may be even greater in the short-run than in the long run. Example: An abrupt depreciation of the dollar against foreign currencies causes the price of farm equipment in the U.S. to differ from that of foreign's until markets adjust to the exchange rate change.

**Figure 15-4: Price Levels and Real Incomes, 1992**

The Real Exchange Rate

It is a broad summary measure of the prices of one country’s goods and services relative to the other’s. It is defined in terms of nominal exchange rates and price levels. The real dollar/euro exchange rate is the dollar price of the European basket relative to that of the American:

$$ q_{SE} = \left( \frac{E_{SE}}{P_E} \right) \frac{P_{US}}{P_{US}} \quad (15-6) $$

Example: If the European reference commodity basket costs $100, the U.S. basket costs $120, and the nominal exchange rate is $1.20 per euro, then the real dollar/euro exchange rate is 1 U.S. basket per European basket.

**Beyond Purchasing Power Parity: A General Model of Long-Run Exchange Rates**

A real depreciation of the dollar against the euro is a fall in the real dollar/euro exchange rate. That is, a fall in the purchasing power of a dollar within Europe's borders relative to its purchasing power within the United States. Or alternatively, a fall in the purchasing power of America's products in general over Europe's. A real appreciation of the dollar against the euro is the opposite of a real depreciation.

**Demand, Supply, and the Long-Run Real Exchange Rate**

In a world where PPP does not hold, the long-run values of real exchange rates depend on demand and supply conditions. There are two specific causes that explain why the long-run values of real exchange rates can change:

1. A change in world relative demand for American products
   - An increase (fall) in world relative demand for U.S. output causes a long-run real appreciation (depreciation) of the dollar against the euro.
2. A change in relative output supply
   - A relative expansion of U.S. (European) output causes a long-run real depreciation (appreciation) of the dollar against the euro.

**Nominal and Real Exchange Rates in Long-Run Equilibrium**

Changes in national money supplies and demands give rise to the proportional long-run movements in nominal exchange rates and international price level ratios predicted by the relative PPP theory. From Equation (15-6), one can obtain the nominal dollar/euro exchange rate, which is the real dollar/euro exchange rate times the U.S.-Europe price level ratio:

$$ E_{SE} = q_{SE} \times \left( \frac{P_{US}}{P_E} \right) \quad (15-7) $$

Equation (15-7) implies that for a given real dollar/euro exchange rate, changes in money demand or supply in Europe or the U.S. affect the long-run nominal dollar/euro exchange rate as in the monetary approach. Changes in the long-run real exchange rate, however, also affect the long-run nominal exchange rate.

The most important determinants of long-run swings in nominal exchange rates (assuming that all variables start out at their long-run levels):

- A shift in relative money supply levels
- A shift in relative money supply growth rates
- A change in relative output demand
- A change in relative output supply

When all disturbances are monetary in nature, exchange rates obey relative PPP in the long run. In the long run, a monetary disturbance affects only the general purchasing power of a currency. This change in purchasing power changes equally the currency's value in terms of domestic and foreign goods. When disturbances occur in output markets, the exchange rate is unlikely to obey relative PPP, even in the long run.

**Table 15-1: Effects of Money Market and Output Market Changes on the Long-Run Nominal Dollar/Euro Exchange Rate, $E$/€**

<table>
<thead>
<tr>
<th>Change</th>
<th>Proportional increase (nominal depreciation of $)</th>
<th>Proportional decrease (nominal appreciation of euro)</th>
<th>Increase (nominal depreciation of $)</th>
<th>Decrease (nominal appreciation of euro)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Money market</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Increase in U.S. money supply level</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Increase in European money supply level</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>3. Increase in U.S. money supply growth rate</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>4. Increase in European money supply growth rate</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Output market</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Increase in demand for U.S. output</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Increase in demand for European output</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Output supply increase in the United States</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Output supply increase in Europe</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 15-5: The Real Dollar/Yen Exchange Rate, 1950-2000**

The US dollar has steadily depreciated in real terms against Japan’s yen. (The straight line indicates the average trend over time in the real exchange rate.)

**Figure 15-6: Sectoral Productivity Growth Differences and the Change in the Relative Price of Nontradable Goods, 1970-1985**

Average annual percent change in relative price of nontradables

National Interest Rate Differences and the Real Exchange Rate

In general, interest rate differences between countries depend not only on differences in expected inflation, but also on expected changes in the real exchange rate. Relationship between the expected change in the real exchange rate, the expected change in the nominal rate, and expected inflation:

$$(\hat{q}_{SE} - q_{SE})/q_{SE} = \left( (E_{SE} - E_{SE})/E_{SE} \right) + (\pi_{US} - \pi_{E}) $$

Combining Equation (15-8) with the interest parity condition, the international interest gap is equal to:
Determinants of Consumption Demand
Consumption demand increases as disposable income (i.e., national income less taxes) increases at the aggregate level. The increase in consumption demand is less than the increase in the disposable income because part of the income increase is saved. The CA balance is viewed as the demand for a country’s exports (EX) less that country’s own demand for imports (IM). The CA balance is determined by two main factors:
1. The domestic currency’s real exchange rate against foreign currency (q = EP/P)
2. Domestic disposable income (Yd)

How Real Exchange Rate Changes Affect the Current Account
An increase in q raises EX and improves the domestic country’s CA. Each unit of domestic output now purchases fewer units of foreign output, therefore, foreign will demand more exports. An increase q can raise or lower IM and has an ambiguous effect on CA. IM denotes the value of imports measured in terms of domestic output.

There are two effects of a real exchange rate:
1. Volume effect: he effect of consumer spending shifts on export and import quantities
2. Value effect: it changes the domestic output worth of a given volume of foreign imports.

Whether the CA improves or worsens depends on which effect of a real exchange rate change is dominant. We assume that the volume effect of a real exchange rate change always outweighs the value effect.

How Disposable Income Changes Affect the Current Account
– An increase in disposable income (Yd) worsens the CA.
– A rise in Yd causes domestic consumers to increase their spending on all goods.

Determinants of Aggregate Demand in an Open Economy

Table 16-1: Factors Determining the Current Account

The Equation of Aggregate Demand
The four components of aggregate demand are combined to get the total aggregate demand:

\[ D = C(Y - T) + I + G + CA(EP/P, Y - T) \]

This equation shows that aggregate demand for home output can be written as:

\[ D = D(EP/P, Y - T, I, G) \]

The Real Exchange Rate and Aggregate Demand
An increase in q raises CA and D.
– It makes domestic goods and services cheaper relative to foreign goods and services.
– It shifts both domestic and foreign spending from foreign goods to domestic goods.
– A real depreciation of the home currency raises aggregate demand for home output.
– A real appreciation lowers aggregate demand for home output.

Real Income and Aggregate Demand
A rise in domestic real income raises aggregate demand for home output. A fall in domestic real income lowers aggregate demand for home output.

Figure 16-1: Aggregate Demand as a Function of Output

How Output Is Determined in the Short Run
Output market is in equilibrium in the short-run when real output, Y, equals the aggregate demand for domestic output:

\[ D = Y \]
Figure 16-2: The Determination of Output in the Short Run

Output, the Exchange Rate, and Output Market Equilibrium

With fixed price levels at home and abroad, a rise in the nominal exchange rate makes foreign goods and services more expensive relative to domestic goods and services. Any rise in q will cause output to contract.

Output Market Equilibrium in the Short Run: The DD Schedule

Figure 16-3: Output Effect of a Currency Depreciation with Fixed Output Prices

Deriving the DD Schedule

It shows all combinations of output and the exchange rate for which the output market is in short-run equilibrium (aggregate demand = aggregate output). It slopes upward because a rise in the exchange rate causes output to rise.

Factors that Shift the DD Schedule

1. Government purchases
2. Taxes
3. Investment
4. Domestic price levels
5. Foreign price levels
6. Domestic consumption
7. Demand shift between foreign and domestic goods

A disturbance that raises (lowers) aggregate demand for domestic output shifts the DD schedule to the right (left).

Figure 16-4: Deriving the DD Schedule

Deriving the AA Schedule

It relates exchange rates and output levels that keep the money and foreign exchange markets in equilibrium. It slopes downward because a rise in output causes a rise in the home interest rate and a domestic currency appreciation.

Factors that Shift the AA Schedule

1. Government demand
2. Money market conditions
3. Foreign exchange market conditions
4. Domestic output levels
5. Interest rates
6. Exchange rates
7. Demand for foreign currency
8. Supply of foreign currency

A disturbance that raises (lowers) aggregate demand for foreign output shifts the AA schedule to the right (left).

Figure 16-5: Government Demand and the Position of the DD Schedule

Asset Market Equilibrium in the Short Run: The AASchedule

It shows all combinations of exchange rate and output that are consistent with equilibrium in the domestic money market and the foreign exchange market.

Output, the Exchange Rate, and Asset Market Equilibrium

We will combine the interest parity condition with the money market to derive the asset market equilibrium in the short-run. The interest parity condition describing foreign exchange market equilibrium is:

\[ R = R^* + (E_e - E)/E \]

where:
- \( E_e \) is the expected future exchange rate
- \( R \) is the interest rate on domestic currency deposits
- \( R^* \) is the interest rate on foreign currency deposits

The \( R \) satisfying the interest parity condition must also equate the real domestic money supply to aggregate real money demand:

\[ M_s/P = L(R, Y) \]

Aggregate real money demand \( L(R, Y) \) rises when the interest rate falls because a fall in \( R \) makes interest-bearing nonmoney assets less attractive to hold.

Figure 16-6: Output and the Exchange Rate in Asset Market Equilibrium

For asset markets to remain in equilibrium:

A rise in domestic output must be accompanied by an appreciation of the domestic currency. A fall in domestic output must be accompanied by a depreciation of the domestic currency.

Deriving the AA Schedule

It relates exchange rates and output levels that keep the money and foreign exchange markets in equilibrium. It slopes downward because a rise in output causes a rise in the home interest rate and a domestic currency appreciation.

Figure 16-7: The AA Schedule
1. Domestic money supply
2. Domestic price level
3. Expected future exchange rate
4. Foreign interest rate
5. Shifts in the aggregate real money demand schedule

Short-Run Equilibrium for an Open Economy: Putting the DD and AA Schedules Together
A short-run equilibrium for the economy as a whole must bring equilibrium simultaneously in the output and asset markets. That is, it must lie on both DD and AA schedules.

Figure 16-8: Short-Run Equilibrium: The Intersection of DD and AA

Temporary Changes in Monetary and Fiscal Policy
Two types of government policy:
1. Monetary policy: It works through changes in the money supply.
2. Fiscal policy: It works through changes in government spending or taxes.

Temporary policy shifts are those that the public expects to be reversed in the near future and do not affect the long-run expected exchange rate. Assume that policy shifts do not influence the foreign interest rate and the foreign price level.

Monetary Policy
An increase in money supply (i.e., expansionary monetary policy) raises the economy’s output. The increase in money supply creates an excess supply of money, which lowers the home interest rate. As a result, the domestic currency must depreciate (i.e., home products become cheaper relative to foreign products) and aggregate demand increases.

Figure 16-10: Effects of a Temporary Increase in the Money Supply

Fiscal Policy
An increase in government spending, a cut in taxes, or some combination of the two (i.e., expansionary fiscal policy) raises output. The increase in output raises the transactions demand for real money holdings, which in turn increases the home interest rate. As a result, the domestic currency must appreciate.

Figure 16-11: Effects of a Temporary Fiscal Expansion

Policies to Maintain Full Employment
Temporary disturbances that lead to recession can be offset through expansionary monetary or fiscal policies. Temporary disturbances that lead to overemployment can be offset through contractionary monetary or fiscal policies.

Figure 16-12: Maintaining Full Employment After a Temporary Fall in World Demand for Domestic Products

Figure 16-13: Policies to Maintain Full Employment After a Money-Demand Increase

Inflation Bias and Other Problems of Policy Formulation
Problems of policy formulation:

- Inflation bias
- High inflation with no average gain in output that results from governments’ policies to prevent recession
- Identifying the sources of economic changes
- Identifying the durations of economic changes
- The impact of fiscal policy on the government budget
- Time lags in implementing policies

Permanent Shifts in Monetary and Fiscal Policy
A permanent policy shift affects not only the current value of the government’s policy instrument but also the long-run exchange rate. This affects expectations about future exchange rates.

A Permanent Increase in the Money Supply

A permanent increase in the money supply causes the expected future exchange rate to rise proportionally. As a result, the upward shift in the AA schedule is greater than that caused by an equal, but transitory, increase (compare point 2 with point 3 in Figure 16-14).

Figure 16-14: Short-Run Effects of a Permanent Increase in the Money Supply

Adjustment to a Permanent Increase in the Money Supply

The permanent increase in the money supply raises output above its full-employment level. As a result, the price level increases to bring the economy back to full employment. Figure 16-15 shows the adjustment back to full employment.

Figure 16-15: Long-Run Adjustment to a Permanent Increase in the Money Supply

A Permanent Fiscal Expansion

A permanent fiscal expansion changes the long-run expected exchange rate. If the economy starts at long-run equilibrium, an immediate and permanent exchange rate jump that offsets exactly the fiscal policy’s direct effect on aggregate demand.

Figure 16-16: Effects of a Permanent Fiscal Expansion Changing the Capital Stock

Gradual Trade Flow Adjustment and Current Account Dynamics

The J-Curve

If imports and exports adjust gradually to real exchange rate changes, the CA may follow a J-curve pattern after a real currency depreciation, first worsening and then improving. Currency depreciation may have a contractionary initial effect on output, and exchange rate overshooting will be amplified. It describes the time lag with which a real currency depreciation improves the CA.

Figure 16-18: The J-Curve

Exchange Rate Pass-Through and Inflation

The CA in the DD-AA model has assumed that nominal exchange rate changes cause proportional changes in the real exchange rates in the short run. The degree of pass-through is 1. Exchange rate pass-through can be incomplete because of international market segmentation. Currency movements have less-than-proportional effects on the relative prices determining trade volumes.

Summary

The aggregate demand for an open economy’s output consists of four components: consumption demand, investment demand, government demand, and the current account. The economy’s short-run equilibrium occurs at the exchange rate and output level. A temporary increase in the money supply causes a depreciation of the currency and a rise in output. Permanent shifts in the money supply cause sharper exchange rate movements and therefore have stronger short-run effects on output than transitory shifts. If exports and imports adjust gradually to real exchange rate changes, the current account may follow a J-curve pattern after a real currency depreciation, first worsening and then improving.
Appendix I: The IS-LM Model and the DD-AA Mode

Figure 16AI-1: Short-Run Equilibrium in the IS-LM Model

Figure 16AI-2: Effects of Permanent and Temporary Increases in the Money Supply in the IS-LM Model

Figure 16AI-3: Effects of Permanent and Temporary Fiscal Expansions in the IS-LM Model

Table 17-1: Exchange Rate Arrangements (As of March 31, 2001)


<table>
<thead>
<tr>
<th>Country</th>
<th>Impact</th>
<th>Short-run</th>
<th>Long-run</th>
<th>Impact</th>
<th>Short-run</th>
<th>Long-run</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>0.59</td>
<td>0.71</td>
<td>1.37</td>
<td>0.03</td>
<td>0.36</td>
<td>0.88</td>
</tr>
<tr>
<td>Belgium</td>
<td>0.18</td>
<td>0.59</td>
<td>1.55</td>
<td>0.13</td>
<td>0.70</td>
<td>0.79</td>
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<tr>
<td>Brazil</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>0.60</td>
<td>0.75</td>
<td>0.73</td>
</tr>
<tr>
<td>Canada</td>
<td>0.08</td>
<td>0.40</td>
<td>0.71</td>
<td>0.72</td>
<td>0.72</td>
<td>0.72</td>
</tr>
<tr>
<td>Denmark</td>
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<td>1.13</td>
<td>1.13</td>
<td>0.55</td>
<td>0.63</td>
<td>1.14</td>
</tr>
<tr>
<td>France</td>
<td>0.20</td>
<td>0.48</td>
<td>1.59</td>
<td>0.49</td>
<td>0.64</td>
<td>0.64</td>
</tr>
<tr>
<td>Germany</td>
<td>—</td>
<td>—</td>
<td>1.41</td>
<td>0.57</td>
<td>0.77</td>
<td>0.77</td>
</tr>
<tr>
<td>Italy</td>
<td>—</td>
<td>—</td>
<td>0.56</td>
<td>0.64</td>
<td>0.94</td>
<td>0.94</td>
</tr>
<tr>
<td>Japan</td>
<td>0.40</td>
<td>1.21</td>
<td>1.61</td>
<td>0.16</td>
<td>0.72</td>
<td>0.97</td>
</tr>
<tr>
<td>Netherlands</td>
<td>0.24</td>
<td>0.49</td>
<td>0.89</td>
<td>0.71</td>
<td>1.22</td>
<td>1.22</td>
</tr>
<tr>
<td>Norway</td>
<td>0.40</td>
<td>0.74</td>
<td>1.48</td>
<td>0.01</td>
<td>0.71</td>
<td>0.94</td>
</tr>
<tr>
<td>Sweden</td>
<td>0.27</td>
<td>0.73</td>
<td>1.59</td>
<td>—</td>
<td>0.73</td>
<td>0.94</td>
</tr>
<tr>
<td>Switzerland</td>
<td>0.28</td>
<td>0.42</td>
<td>0.73</td>
<td>0.25</td>
<td>0.25</td>
<td>0.22</td>
</tr>
<tr>
<td>United States</td>
<td>0.18</td>
<td>0.48</td>
<td>1.67</td>
<td>—</td>
<td>1.96</td>
<td>1.06</td>
</tr>
</tbody>
</table>

CHAPTER 17

FIXED EXCHANGE RATES AND FOREIGN EXCHANGE INTERVENTION

Introduction
In reality, the assumption of complete exchange rate flexibility is rarely accurate. Industrialized countries operate under a hybrid system of managed floating exchange rates. A system in which governments attempt to moderate exchange rate movements without keeping exchange rates rigidly fixed. A number of developing countries have retained some form of government exchange rate fixing.

How do central banks intervene in the foreign exchange market?

Why Study Fixed Exchange Rates?
Four reasons to study fixed exchange rates:
1. Managed floating
2. Regional currency arrangements
3. Developing countries and countries in transition
4. Lessons of the past for the future

Why Study Fixed Exchange Rates?

Table 17-1: Exchange Rate Arrangements (As of March 31, 2001)

<table>
<thead>
<tr>
<th>Exchange Rate Regime (Number of countries)</th>
<th>Monetary Policy Framework</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exchange rate anchor</td>
<td>Monetary aggregate target</td>
</tr>
<tr>
<td></td>
<td>Inflation targeting framework</td>
</tr>
<tr>
<td></td>
<td>Fund-supported or other monetary program</td>
</tr>
<tr>
<td></td>
<td>Other</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Europe Area</td>
<td></td>
</tr>
<tr>
<td>Euro Area</td>
<td></td>
</tr>
<tr>
<td>Belgium</td>
<td></td>
</tr>
<tr>
<td>EU Member states</td>
<td></td>
</tr>
<tr>
<td>France</td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td></td>
</tr>
<tr>
<td>Italy</td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td></td>
</tr>
<tr>
<td>Netherlands</td>
<td></td>
</tr>
<tr>
<td>Switzerland</td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td></td>
</tr>
</tbody>
</table>

Why Study Fixed Exchange Rates?
Central Bank Intervention and the Money Supply

The Central Bank Balance Sheet and the Money Supply

Central bank balance sheet

It records the assets held by the central bank and its liabilities. It is organized according to the principles of double-entry bookkeeping. Any acquisition of an asset by the central bank results in a change on the assets side of the balance sheet. Any increase in the bank's liabilities results in a change on the balance sheet's liabilities side.

The assets side of a balance sheet lists two types of assets:

- **Foreign assets**
  - Mainly foreign currency bonds owned by the central bank (its official international reserves)

- **Domestic assets**
  - Central bank holdings of claims to future payments by its own citizens and domestic institutions

The liabilities side of a balance sheet lists as liabilities:

- Deposits of private banks
- Currency in circulation

Total assets = total liabilities + net worth

Net worth is constant.

The changes in central bank assets cause equal changes in central bank liabilities. Any central bank purchase of assets automatically results in an increase in the domestic money supply. Any central bank sale of assets automatically causes the money supply to decline.

Foreign Exchange Intervention and the Money Supply

The central bank balance sheet shows how foreign exchange intervention affects the money supply because the central bank's liabilities are the base of the domestic money supply process. The central bank can negate the money supply effect of intervention through sterilization.

Sterilization

Sterilized foreign exchange intervention

Central banks sometimes carry out equal foreign and domestic asset transactions in opposite directions to nullify the impact of their foreign exchange operations on the domestic money supply. Without sterilization, there is a link between the balance of payments and national money supplies that depends on how central banks share the burden of financing payments gaps.

Table 17-2: Effects of a $100 Foreign Exchange Intervention: Summary

<table>
<thead>
<tr>
<th>Domestic Central Bank's Action</th>
<th>Effect on Domestic MoneySupply</th>
<th>Effect on Central Bank Domestic Assets</th>
<th>Effect on Central Bank Foreign Assets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonsterilized foreign exchange purchase</td>
<td>+$100</td>
<td>0</td>
<td>+$100</td>
</tr>
<tr>
<td>Sterilized foreign exchange purchase</td>
<td>0</td>
<td>-$100</td>
<td>+$100</td>
</tr>
<tr>
<td>Nonsterilized foreign exchange sale</td>
<td>-$100</td>
<td>0</td>
<td>-$100</td>
</tr>
<tr>
<td>Sterilized foreign exchange sale</td>
<td>0</td>
<td>+$100</td>
<td></td>
</tr>
</tbody>
</table>

The Balance of Payments and the Money Supply

If central banks are not sterilizing and the home country has a balance of payments surplus, an increase in the home central bank’s foreign assets implies an increased home money supply. A decrease in a foreign central bank’s claims on the home country implies a decreased foreign money supply.

How the Central Bank Fixes the Exchange Rate

Foreign Exchange Market Equilibrium Under a Fixed Exchange Rate

The foreign exchange market is in equilibrium when:

\[ R = R^* + (E_e - E)/E \]

When the central bank fixes \( E = E_0 \), the expected rate of domestic currency depreciation is zero. The interest parity condition implies that \( E = E_0 \) is today’s equilibrium exchange rate only if:

\[ R = R^*. \]

Market Equilibrium Under a Fixed Exchange Rate

To hold the domestic interest rate at \( R^* \), the central bank’s foreign exchange intervention must adjust the money supply so that:

\[ M/P = L(R^*, Y) \]

Example: Suppose the central bank has been fixing \( E = E_0 \) and that asset markets are in equilibrium. An increase in output would raise the money demand and thus lead to a higher interest rate and an appreciation of the home currency. The central bank must intervene in the foreign exchange market by buying foreign assets in order to prevent this appreciation. If the central bank does not purchase foreign assets when output increases but instead holds the money stock constant, it cannot keep the exchange rate fixed at \( E = E_0 \).

A Diagrammatic Analysis

To hold the exchange rate fixed at \( E = E_0 \) when output rises, the central bank must purchase foreign assets and thereby raise the money supply.
Monetary Policy
Under a fixed exchange rate, central bank monetary policy tools are powerless to affect the economy’s money supply or its output.

Figure 17-2 shows the economy’s short-run equilibrium as point 1 when the central bank fixes the exchange rate at the level $E_0$.

Fiscal Policy
How does the central bank intervention hold the exchange rate fixed after the fiscal expansion?

The rise in output due to expansionary fiscal policy raises money demand. To prevent an increase in the home interest rate and an appreciation of the currency, the central bank must buy foreign assets with money (i.e., increasing the money supply).

The effects of expansionary fiscal policy when the economy’s initial equilibrium is at point 1 are illustrated in Figure 17-3.

Changes in the Exchange Rate
Devaluation
It occurs when the central bank raises the domestic currency price of foreign currency, $E$.

It causes:
– A rise in output
– A rise in official reserves
– An expansion of the money supply

It is chosen by governments to:
– Fight domestic unemployment
– Improve the current account
– Affect the central bank’s foreign reserves

Revaluation
It occurs when the central bank lowers $E$. In order to devalue or revalue, the central bank has to announce its willingness to trade domestic against foreign currency, in unlimited amounts, at the new exchange rate.

Figure 17-4: Effects of a Currency Devaluation

Output, $Y$, Exchange rate, $E$

Adjustment to Fiscal Policy and Exchange Rate Changes
Fiscal expansion causes $P$ to rise.
– There is no real appreciation in the short-run
– There is real appreciation in the long-run

Devaluation is neutral in the long-run.

Figure 17-5: A Low-Output Liquidity Trap

Balance of Payments Crisis and Capital Flight
Balance of payments crisis
It is a sharp change in official foreign reserves sparked by a change in expectations about the future exchange rate.

Figure 17-7: Capital Flight, the Money Supply, and the Interest Rate
Evidence on the Effects of Sterilized Intervention

Empirical evidence provides little support for the idea that sterilized intervention has a significant direct effect on exchange rates.

The Signaling Effect of Intervention

Signaling effect of foreign exchange intervention

An important complicating factor in econometric efforts to study the effects of sterilization. Sterilized intervention may give an indication of where the central bank expects (or desires) the exchange rate to move. This signal can change market views of future policies even when domestic and foreign bonds are perfect substitutes.

Reserve Currencies in the World Monetary System

Two possible systems for fixing the exchange rates:

- Reserve currency standard

  Central banks peg the prices of their currencies in terms of a reserve currency. The currency central banks hold in their international reserves.

- Gold standard

  Central banks peg the prices of their currencies in terms of gold.

The two systems have very different implications about:
- How countries share the burden of balance of payments financing
- The growth and control of national monetary supplies

The Mechanics of a Reserve Currency Standard

The workings of a reserve currency system can be illustrated by the system based on the U.S. dollar set up at the end of World War II. Every central bank fixed the dollar exchange rate of its currency through foreign exchange market trades of domestic currency for dollar assets. Exchange rates between any two currencies were fixed.

The Asymmetric Position of the Reserve Center

The reserve-issuing country can use its monetary policy for macroeconomic stabilization even though it has fixed exchange rates. The purchase of domestic assets by the central bank of the reverse currency country leads to:
- Excess demand for foreign currencies in the foreign exchange market
- Expansionary monetary policies by all other central banks
- Higher world output

The Gold Standard

Each country fixes the price of its currency in terms of gold. No single country occupies a privileged position within the system.

The Mechanics of a Gold Standard

Exchange rates between any two currencies were fixed. Example: If the dollar price of gold is pegged at $35 per ounce by the Federal Reserve while the pound price of gold is pegged at £14.58 per ounce by the Bank of England, the dollar/pound exchange rate must be 40 per pound.

Symmetric Monetary Adjustment Under a Gold Standard

Whenever a country is losing reserves and its money supply shrinks as a consequence, foreign countries are gaining reserves and their money supplies expand.

Benefits and Drawbacks of the Gold Standard

Benefits:
- It avoids the asymmetry inherent in a reserve currency standard.
- It places constraints on the growth of countries’ money supplies.

Drawbacks:
- It places undesirable constraints on the use of monetary policy to fight unemployment.
- It ensures a stable overall price level only if the relative price of gold and other goods and services is stable.
- It makes central banks compete for reserves and bring about world unemployment.
Bimetallic standard
The currency was based on both silver and gold. The U.S. was bimetallic from 1837 until the Civil War. In a bimetallic system, a country’s mint will coin specified amounts of gold or silver into the national currency unit. Example: 371.25 grains of silver or 23.22 grains of gold could be turned into a silver or a gold dollar. This made gold worth 371.25/23.22 = 16 times as much as silver. It might reduce the price-level instability resulting from use of one of the metals alone.

The Gold Exchange Standard
Central banks’ reserves consist of gold and currencies whose prices in terms of gold are fixed. A central bank fixes its exchange rate to a currency with a fixed gold price. It can operate like a gold standard in restraining excessive monetary growth throughout the world, but it allows more flexibility in the growth of international reserves.

Summary
There is a direct link between central bank intervention in the foreign exchange market and the domestic money supply. When a country’s central bank purchases (sells) foreign assets, the country’s money supply automatically increases (decreases). The central bank balance sheet shows how foreign exchange intervention affects the money supply. The central bank can negate the money supply effect of intervention through sterilization.

A central bank can fix the exchange rate of its currency against foreign currency if it trades unlimited amounts of domestic money against foreign assets at that rate. A commitment to fix the exchange rate forces the central bank to sacrifice its ability to use monetary policy for stabilization. Fiscal policy has a more powerful effect on output under fixed exchange rates than under floating rates.

Self-fulfilling currency crises can occur when an economy is vulnerable to speculation. A system of managed floating allows the central bank to retain some ability to control the domestic money supply. A world system of fixed exchange rates in which countries peg the prices of their currencies in terms of a reserve currency involves a striking asymmetry. A gold standard avoids the asymmetry inherent in a reserve currency standard. A related arrangement was the bimetallic standard based on both silver and gold.

Appendix I: Equilibrium in the Foreign Exchange Market with Imperfect Asset Substitutability

Appendix III: The Timing of Balance of Payments Crises

CHAPTER 19
MACROECONOMIC POLICY AND COORDINATION
UNDER FLOATING EXCHANGE RATES

Introduction
The floating exchange rate system, in place since 1973, was not well planned before its inception. By the mid-1980s, economists and policymakers had become more skeptical about the benefits of an international monetary system based on floating rates.

Why has the performance of floating rates been so disappointing?
What direction should reform of the current system take?

This chapter compares the macroeconomic policy problems of different exchange rate regimes.

The Case for Floating Exchange Rates
There are three arguments in favor of floating exchange rates:
1. Monetary policy autonomy
2. Symmetry
3. Exchange rates as automatic stabilizers

Monetary Policy Autonomy
Floating exchange rates:
Restore monetary control to central banks. Allow each country to choose its own desired long-run inflation rate

Symmetry
Floating exchange rates remove two main asymmetries of the Bretton Woods system and allow Central banks abroad to be able to determine their own domestic money supplies. The U.S. to have the same opportunity as other countries to influence its exchange rate against foreign currencies

Exchange Rates as Automatic Stabilizers
Floating exchange rates quickly eliminate the “fundamental disequilibriums” that had led to parity changes and speculative attacks under fixed rates. Figure 19-1 shows that a temporary fall in a country's export demand reduces that country's output more under a fixed rate than a floating rate.

The Case Against Floating Exchange Rates
There are five arguments against floating rates:
1. Discipline
2. Destabilizing speculation and money market disturbances
3. Injury to international trade and investment
4. Uncoordinated economic policies
5. The illusion of greater autonomy

Discipline
Floating exchange rates do not provide discipline for central banks. Central banks might embark on inflationary policies [e.g., the German hyperinflation of the 1920s]. The pro-floaters’ response was that a floating exchange rate would bottle up inflationary disturbances within the country whose government was misbehaving.

Destabilizing Speculation and Money Market Disturbances
Floating exchange rates allow destabilizing speculation. Countries can be caught in a "vicious circle" of depreciation and inflation. Advocates of floating rates point out that destabilizing speculators ultimately lose money. Floating exchange rates make a country more vulnerable to money market disturbances. Figure 19-2 illustrates this point.

Figure 19-1: Effects of a Fall in Export Demand

Figure 19-2: A Rise in Money Demand Under a Floating Exchange Rate
Injury to International Trade and Investment
Floating rates hurt international trade and investment because they make relative international prices more unpredictable:
- Exporters and importers face greater exchange risk.
- International investments face greater uncertainty about their payoffs.

Supporters of floating exchange rates argue that forward markets can be used to protect traders against foreign exchange risk. The skeptics replied to this argument by pointing out that forward exchange markets would be expensive.

Uncoordinated Economic Policies
Floating exchange rates leave countries free to engage in competitive currency depreciations. Countries might adopt policies without considering their possible beggar-thy-neighbor aspects.

The Illusion of Greater Autonomy
Floating exchange rates increase the uncertainty in the economy without really giving macroeconomic policy greater freedom. A currency depreciation raises domestic inflation due to higher wage settlements.

Table 19-1: Inflation Rates in Major Industrialized Countries, 1973-1980

<table>
<thead>
<tr>
<th>Year</th>
<th>United States</th>
<th>Britain</th>
<th>Canada</th>
<th>France</th>
<th>Germany</th>
<th>Italy</th>
<th>Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td>1973</td>
<td>6.2</td>
<td>3.8</td>
<td>4.1</td>
<td>5.7</td>
<td>7.6</td>
<td>7.6</td>
<td>13.3</td>
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<tr>
<td>1974</td>
<td>6.6</td>
<td>3.3</td>
<td>5.8</td>
<td>5.8</td>
<td>7.5</td>
<td>7.1</td>
<td>13.1</td>
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<td>1975</td>
<td>7.7</td>
<td>5.4</td>
<td>6.8</td>
<td>6.8</td>
<td>7.7</td>
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Table 19-2: Unemployment Rates in Major Industrialized Countries, 1978-2000 (percent of civilian labor force)

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Table 19-3: Inflation Rates in Major Industrialized Countries 1981-2000, and 1961-1971 Average (percent per year)

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Macroeconomic Interdependence Under a Floating Rate
Assume that there are two large countries, Home and Foreign. Macroeconomic interdependence between Home and Foreign:

Effect of a permanent monetary expansion by Home

What Has Been Learned Since 1973?
Monetary Policy Autonomy

Floating exchange rates allowed a much larger international divergence in inflation rates. High-inflation countries have tended to have weaker currencies than their low-inflation neighbors. In the short run, the effects of monetary and fiscal changes are transmitted across national borders under floating rates.

Figure 19: Exchange Rate Trends and Inflation Differentials, 1973-2000

Percent change in foreign-currency price of U.S. dollar, 1973–2000

Ather 1973 central banks intervened repeatedly in the foreign exchange market to alter currency values. Why did central banks continue to intervene even in the absence of any formal obligation to do so?

–To stabilize output and the price level when certain disturbances occur

–To prevent sharp changes in the international competitiveness of tradable goods sectors

Symmetry

The international monetary system did not become symmetric until ather 1973. Central banks continued to hold dollar reserves and intervene. The current floating-rate system is similar in some ways to the asymmetric reserve currency system underlying the Bretton Woods arrangements (McKinnon).

The Exchange Rate as an Automatic Stabilizer

Experience with the two oil shocks favors floating exchange rates. The effects of the U.S. fiscal expansion ather 1981 provide mixed evidence on the success of floating exchange rates.

Discipline

Inflation rates accelerated ather 1973 and remained high through the second oil shock. The system placed fewer obvious restraints on unbalanced fiscal policies. Example: The high U.S. government budget deficits of the 1980s.

Destabilizing Speculation

Floating exchange rates have exhibited much more day-to-day volatility. The question of whether exchange rate volatility has been excessive is controversial. In the longer term, exchange rates have roughly reflected fundamental changes in monetary and fiscal policies and not destabilizing speculation. Experience with floating exchange rates contradicts the idea that arbitrary exchange rate movements can lead to “vicious circles” of inflation and depreciation.

International Trade and Investment

International financial intermediation expanded strongly ather 1973 as countries lowered barriers to capital movement. For most countries, the extent of their international trade shows a rising trend ather the move to floating.

Policy Coordination

Floating exchange rates have not promoted international policy coordination. Critics of floating have not made a strong case that the problem of beggar-thy-neighbor policies would disappear under an alternative currency regime.

Are Fixed Exchange Rates Even an Option for Most Countries?

Maintaining fixed exchange rates in the long-run requires strict controls over capital movements. Attempts to fix exchange rates will necessarily lack credibility and be relatively short-lived. Fixed rates will not deliver the benefits promised by their proponents.

Directions for Reform

The experience of floating does not fully support either the early advocates of that exchange rate system or its critics. One unambiguous lesson of experience is that no exchange rate system functions well when international economic cooperation breaks down. Severe limits on exchange rate flexibility are unlikely to be reinstated in the near future. Increased consultation among policymakers in the industrial countries should improve the performance of floating rates.

Summary

The weaknesses of the Bretton Woods system led many economists to advocate floating exchange rates before 1973 based on three arguments: 1. Floating rates would give countries greater autonomy in managing their economies. 2. Floating rates would remove the asymmetries of the Bretton Woods system. 3. Floating rates would quickly eliminate the “fundamental disequilibriums.”

Floating would encourage monetary and fiscal excesses and beggar-thy-neighbor policies. Floating rates would be subject to destabilizing speculation and retard international trade and investment. Between 1973 and 1980 floating rates seemed on the whole to function well. A sharp turn toward slower monetary growth in the U.S. contributed to massive dollar appreciation between 1980 and early 1985. The experience of floating does not fully support either the early advocates of that exchange rates system or its critics.

Appendix: International Policy Coordination Failures

Figure 19A: Hypothetical Effects of Different Monetary Policy Combinations on Inflation and Unemployment

Figure 19A: Payoff Matrix for Different Monetary Policy Moves

CHAPTER 20

OPTIMUM CURRENCY AREAS AND THE EUROPEAN EXPERIENCE

Introduction

European Union countries have progressively narrowed the fluctuations of their currencies against each other. This culminated in the birth of the euro on January 1, 1999.

This chapter focuses on the following questions:

– How and why did Europe set up its single currency?
– Will the euro be good for the economies of its members?
How will the euro affect countries outside of the European Monetary Union (EMU)?

What lessons does the European experience carry for other potential currency blocks?

Figure 20-1: Members of the Euro Zone as of January 1, 2001

Table 20-1: A Brief Glossary of Euronyms

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ECB</td>
<td>European Central Bank</td>
</tr>
<tr>
<td>ESCB</td>
<td>European System of Central Banks</td>
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<tr>
<td>EMS</td>
<td>European Monetary System</td>
</tr>
<tr>
<td>EMU</td>
<td>Economic and Monetary Union</td>
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<tr>
<td>ERM</td>
<td>Exchange Rate Mechanism</td>
</tr>
<tr>
<td>SGP</td>
<td>Stability and Growth Pact</td>
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</table>

European Currency Reform Initiatives, 1969-1978

The Werner report (1969)

It set out a blueprint for the stage-by-stage realization of Economic and Monetary Union by proposing a three-phase program to:

1. Eliminate intra-European exchange rate movements
2. Centralize EU monetary policy decisions
3. Lower remaining trade barriers within Europe

Two major reasons for adopting the Euro:

1. To enhance Europe’s role in the world monetary system
2. To turn the European Union into a truly unified market

The European Monetary System, 1979-1998

Germany, the Netherlands, Belgium, Luxembourg, France, Italy, and Britain participated in an informal joint float against the dollar known as the “snake.” Most exchange rates could fluctuate up or down by as much as 2.25% relative to an assigned par value. The snake served as a prologue to the more comprehensive European Monetary System (EMS). Eight original participants in the EMS’s exchange rate mechanism began operating a formal network of mutually pegged exchange rates in March 1979.

Capital controls and frequent realignments were essential ingredients in maintaining the system until the mid-1980s. After the mid-1980s, these controls have been abolished as part of the EU’s wider “1992” program of market unification. During the currency crisis that broke out in September 1992, Britain and Italy allowed their currencies to float. In August 1993 most EMS currency bands were widened to ±15% in the face of continuing speculative attacks.

German Monetary Dominance and the Credibility Theory of the EMS

Germany has low inflation and an independent central bank. It also has the reputation for tough anti-inflation policies.

Credibility theory of the EMS

By fixing their currencies to the DM, the other EMS countries in effect imported the German Bundesbank’s credibility as an inflation fighter. Inflation rates in EMS countries tended to converge around Germany’s generally low inflation rate.

Table 20-1: Behavior of the Euro’s Exchange Rates Against Major Currencies

The EU “1992” Initiative

The EU countries have tried to achieve greater internal economic unity by:

1. Fixing mutual exchange rates
2. Direct measures to encourage the free flow of goods, services, and factors of production

The process of market unification began when the original EU members formed their customs union in 1957. The Single European Act of 1986 provided for a free movement of people, goods, services, and capital and established many new policies.

European Economic and Monetary Union

In 1989, the Delors report laid the foundations for the single currency, the euro.

Economic and monetary union (EMU)

A European Union in which national currencies are replaced by a single EU currency managed by a sole central bank that operates on behalf of all EU members.

Three stages of the Delors plan:

1. All EU members were to join the EMS exchange rate mechanism (ERM)
2. Exchange rate margins were to be narrowed and certain macroeconomic policy decisions placed under more centralized EU control
3. Replacement of national currencies by a single European currency and vesting all monetary policy decisions in a ESCB

Maastricht Treaty (1991)

1. It set out a blueprint for the transition process from the EMS fixed exchange rate system to EMU.
2. It specified a set of macroeconomic convergence criteria that EU countries need to satisfy for admission to EMU.
3. It included steps toward harmonizing social policy within the EU and toward centralizing foreign and defense policy decision.

EU countries moved away from the EMS and toward the single shared currency for four reasons:

1. Greater degree of European market integration
2. Same opportunity as Germany to participate in system-wide monetary decisions
3. Complete freedom of capital movements
4. Political stability of Europe

The Euro and Economic Policy in the Euro Zone

The Maastricht Convergence Criteria and the Stability and Growth Pact

The Maastricht Treaty specifies that EU member countries must satisfy several convergence criteria:

1. Price stability
   Maximum inflation rate 1.5% above the average of the three EU member states with lowest inflation
2. Exchange rate stability
   Stable exchange rate within the ERM without devaluing on its own initiative
3. Budget discipline
   Maximum public-sector deficit 3% of the country’s GDP
   Maximum public debt 60% of the country’s GDP
A Stability and Growth Pact (SGP) in 1997 sets up:
- The medium-term budgetary objective of positions close to balance or in surplus
- A timetable for the imposition of financial penalties on countries that fail to correct situations of “excessive” deficits and debt promptly enough

The European System of Central Banks
It consists of the European Central Bank in Frankfurt plus 12 national central banks. It conducts monetary policy for the euro zone. It is dependent on politicians in two respects:
- The ESCB’s members are political appointments.
- The Maastricht Treaty leaves exchange rate policy for the euro zone ultimately in the hands of the political authorities.

The Revised Exchange Rate Mechanism
It defines broad exchange rate zones for EU countries that are not yet members of EMU against the euro. It specifies reciprocal intervention arrangements to support these target zones. It is referred to as ERM 2.

It was viewed necessary in order to: Discourage competitive devaluations against the euro by EU members outside the euro zone. Give would-be EMU entrants a way of satisfying the exchange rate stability convergence criterion.

The Theory of Optimum Currency Areas

Theory of optimum currency areas
It predicts that fixed exchange rates are most appropriate for areas closely integrated through international trade and factor movements.

Economic Integration and the Benefits of a Fixed Exchange Rate Area: GG Schedule

Monetary efficiency gain
The jointer’s saving from avoiding the uncertainty, confusion, and calculation and transaction costs that arise when exchange rates float. It is higher, the higher the degree of economic integration between the joining country and the fixed exchange rate area.

GG Schedule
It shows how the potential gain of a country from joining the euro zone depends on its trading link with that region. It slopes upward.

The Decision to Join a Currency Area: Putting the GG and LL Schedules Together

The intersection of GG and LL determines a critical level of economic integration between a fixed exchange rate area and a country. Shows how a country should decide whether to fix its currency’s exchange rate against the euro.

Figure 20-5: The LL Schedule
Economic stability loss
The economic stability loss that arises because a country that joins an exchange rate area gives up its ability to use the exchange rate and monetary policy for the purpose of stabilizing output and employment. It is lower, the higher the degree of economic integration between a country and the fixed exchange rate area that it joins.

LL Schedule
It shows the relationship of the country’s economic stability loss from joining. It slopes downward.

The Theory of Optimum Currency Areas

Figure 20-6: Deciding When to Peg the Exchange Rate

The GG-LL framework can be used to examine how changes in a country’s economic environment affect its willingness to peg its currency to an outside currency area. Figure 20-7 illustrates an increase in the size and frequency of sudden shifts in the demand for the country’s exports.

Figure 20-7: An Increase in Output Market Variability
What Is an Optimum Currency Area?
It is a region where it is best (optimal) to have a single currency. Optimality depends on degree of economic integration:
– Trade in goods and services
– Factor mobility

A fixed exchange rate area will best serve the economic interests of each of its members if the degree of output and factor trade among them is high.

Figure 20-8: Intra-EU Trade as a Percent of EU GDP

Table 20-2: People Changing Region of Residence in 1986 (percent of total population)

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<tr>
<th>Country</th>
<th>1986</th>
<th>1992</th>
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<tr>
<td>Germany</td>
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<tr>
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<td>3.0</td>
</tr>
</tbody>
</table>

Table 20-2: People Changing Region of Residence in 1986 (percent of total population)

Case Study: Is Europe an Optimum Currency Area?
Europe is not an optimum currency area:
– Most EU countries export form 10% to 20% of their output to other EU countries.
– EU-U.S. trade is only 2% of U.S. GNP.
– Labor is much more mobile within the U.S. than within Europe.
– Federal transfers and changes in federal tax payments provide a much bigger cushion for region-specific shocks in the U.S. than do EU revenues and expenditures.

Figure 20-9: Divergent Inflation in the Euro Zone

Introduction
The macroeconomic problems of the world’s developing countries affect the stability of the entire international economy. There has been greater economic dependency between developing and industrial countries since WWII. This chapter examines the macroeconomic problems of developing countries and the repercussions of those problems on the developed countries. Example: Causes and effects of the East Asian financial crisis in

Summary
Fixed exchange rates in Europe were a by-product of the Bretton Woods system. The EMS of fixed intra-EU exchange rates was inaugurated in March 1979. In practice all EMS currencies were pegged to the DM. On January 1, 1999, 11 EU countries initiated an EMU by adopting a common currency, the euro. Greece became the 12th member two years later.

The Maastricht Treaty specified a set of macroeconomic convergence criteria that EU countries would need to satisfy to qualify for admission to EMU. The theory of optimum currency areas implies that countries will wish to join fixed exchange rate areas linked to their own economies through trade and factor mobility. The EU does not appear to satisfy all of the criteria for an optimum currency area.

CHAPTER 22
DEVELOPING COUNTRIES: GROWTH, CRISIS, AND REFORM

If EMU succeeds it will promote European political as well as economic integration. If EMU fails the goal of European political unification will be set back. Problems that the EMU will face in the coming years:
1. Europe is not an optimum currency area.
2. Economic union is so far in front of political union.
3. EU labor markets are very rigid.
4. SGP constrains fiscal policies.

Income, Wealth, and Growth In the World Economy
The Gap Between Rich and Poor
The world’s economies can be divided into four main categories according to their annual per-capita income levels:
– Low-income economies
– Lower middle-income economies
– Upper middle-income economies
– High-income economies

Has the World Income Gap Narrowed Over Time?
Industrial countries have shown convergence in their per capita incomes. Developing countries have not shown a uniform tendency of convergence to the income levels of industrial countries.
– Countries in Africa and Latin America have grown at very low rates.
– East Asian countries have tended to grow at very high rates.

Table 22-2: Output Per Capita in Selected Countries, 1960-1992 (in 1985 U.S. dollars)

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<tr>
<td>Senegal</td>
<td>1,062</td>
<td>1,145</td>
<td>0.3</td>
</tr>
<tr>
<td>Latin America</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Argentina</td>
<td>4,481</td>
<td>4,706</td>
<td>0.2</td>
</tr>
<tr>
<td>Brazil</td>
<td>1,780</td>
<td>3,886</td>
<td>2.5</td>
</tr>
<tr>
<td>Chile</td>
<td>2,897</td>
<td>4,880</td>
<td>1.6</td>
</tr>
<tr>
<td>Mexico</td>
<td>2,825</td>
<td>6,250</td>
<td>2.3</td>
</tr>
<tr>
<td>East Asia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hong Kong</td>
<td>2,231</td>
<td>16,461</td>
<td>6.4</td>
</tr>
<tr>
<td>Malaysia</td>
<td>1,409</td>
<td>5,729</td>
<td>4.3</td>
</tr>
<tr>
<td>Singapore</td>
<td>1,636</td>
<td>12,633</td>
<td>6.9</td>
</tr>
<tr>
<td>South Korea</td>
<td>898</td>
<td>3,665</td>
<td>6.9</td>
</tr>
<tr>
<td>Thailand</td>
<td>940</td>
<td>3,924</td>
<td>4.6</td>
</tr>
<tr>
<td>Taiwan</td>
<td>1,255</td>
<td>8,067</td>
<td>6.4</td>
</tr>
</tbody>
</table>
Table 22-1: Indicators of Economic Welfare in Four Groups of Countries, 1999

<table>
<thead>
<tr>
<th>Income group</th>
<th>GNP per capita (US dollars)</th>
<th>Life expectancy (years)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-income</td>
<td>410</td>
<td>60.0</td>
</tr>
<tr>
<td>Lower middle-income</td>
<td>1,200</td>
<td>69.5</td>
</tr>
<tr>
<td>Upper middle-income</td>
<td>4,900</td>
<td>70.5</td>
</tr>
<tr>
<td>High-income</td>
<td>25,730</td>
<td>78.0</td>
</tr>
</tbody>
</table>

*Sample average of male and female life expectancies.

Structural Features of Developing Countries

Most developing countries have at least some of the following features:

1. History of extensive direct government control of the economy
2. History of high inflation reflecting government attempts to extract seigniorage from the economy
3. Weak credit institutions and underdeveloped capital markets
4. Pegged exchange rates and exchange or capital controls
5. Heavy reliance on primary commodity exports
6. High corruption levels

Figure 22-1: Corruption and Per Capita Income

Structural Features of Developing Countries

Developing Country Borrowing and Debt

The Economics of Capital Inflows to Developing Countries

Many developing counties have received extensive capital inflows from abroad and now carry substantial debts to foreigners. Developing country borrowing can lead to gains from trade that make both borrowers and lenders better off.

Table 22-3: Current Account Balances of Major Oil Exporters, Other Developing Countries, and Industrial Countries, 1973-2000 (billions of dollars)

<table>
<thead>
<tr>
<th>Year</th>
<th>Major oil exporters</th>
<th>Other developing countries</th>
<th>Industrial countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>1973</td>
<td>9.06</td>
<td>-8.31</td>
<td>0.4</td>
</tr>
<tr>
<td>1974</td>
<td>71.90</td>
<td>-23.86</td>
<td>-41.56</td>
</tr>
<tr>
<td>1975</td>
<td>43.75</td>
<td>-38.10</td>
<td>-9.27</td>
</tr>
<tr>
<td>1976</td>
<td>40.17</td>
<td>-26.38</td>
<td>-7.66</td>
</tr>
<tr>
<td>1977</td>
<td>23.90</td>
<td>-20.13</td>
<td>-7.84</td>
</tr>
<tr>
<td>1978</td>
<td>4.57</td>
<td>-31.59</td>
<td>4.91</td>
</tr>
<tr>
<td>1979</td>
<td>60.74</td>
<td>-37.42</td>
<td>-38.26</td>
</tr>
<tr>
<td>1980</td>
<td>59.98</td>
<td>-54.36</td>
<td>-78.05</td>
</tr>
<tr>
<td>1981</td>
<td>40.70</td>
<td>-82.80</td>
<td>-62.58</td>
</tr>
<tr>
<td>1982</td>
<td>8.47</td>
<td>-69.90</td>
<td>-34.33</td>
</tr>
<tr>
<td>1983</td>
<td>-17.09</td>
<td>-41.97</td>
<td>26.64</td>
</tr>
<tr>
<td>1984</td>
<td>-6.80</td>
<td>-31.91</td>
<td>-31.85</td>
</tr>
<tr>
<td>1985</td>
<td>-1.95</td>
<td>-37.16</td>
<td>55.74</td>
</tr>
<tr>
<td>1986</td>
<td>-31.54</td>
<td>-41.37</td>
<td>-13.77</td>
</tr>
</tbody>
</table>

Borrowing by developing countries has sometimes led to default crises. The borrower fails to repay on schedule according to the loan contract, without the agreement to the lender.

History of capital flows to developing countries:

- Early 19th century: A number of American states defaulted on European loans they had taken out to finance the building of canals.
- Throughout the 19th century: Latin American countries ran into repayment problems (e.g., the Baring Crisis).
- 1917: The new communist government of Russia repudiated the foreign debts incurred by previous rulers.
- Great Depression (1930s): Nearly every developing country defaulted on its external debts.

Alternative Forms of Capital Inflow

Five major channels through which developing countries have financed their external deficits:

- Bond finance
- Bank finance
- Official lending
- Direct foreign investment
- Portfolio investment in ownership of firms

This channel has been reinforced by many developing countries' efforts at privatization.

Table 22-2: Private Equity in Africa

The five types of finance can be classified into two categories:

- Debt finance: Bond, bank, and official finance
- Equity finance: Direct investment and portfolio purchases of stock shares

Latin America: From Crisis to Uneven Reform

Inflation and the 1980s Debt Crisis in Latin America

In the 1970s, as the Bretton Woods system collapsed, countries in Latin America entered an era of inferior macroeconomic performance.

Unsuccessful Assaults on Inflation: The Tablitas of the 1970s

1978: Argentina, Chile, and Uruguay all turned to a new exchange-rate-based strategy in the hope of taming inflation.

Tablita: It is a preannounced schedule of declining rates of domestic currency depreciation against the U.S. dollar. It is a type of exchange rate regime known as a crawling peg. It declined the rate of currency depreciation against the dollar by reducing the rate of increase in the prices of internationally tradable goods to force overall inflation down.
The Debt Crisis of the 1980s
The great recession of the early 1980s sparked a crisis over developing country debt. The shift to contractionary policy by the U.S. led to:
- The fall in industrial countries' aggregate demand
- An immediate and spectacular rise in the interest burden of debtor countries had to pay
- A sharp appreciation of the dollar
- A collapse in the primary commodity prices

Reforms, Capital Inflows, and the Return of Crisis

Argentina
- 1970s – It tried unsuccessfully to stabilize inflation through a crawling peg.
- 1980s – It implemented successive inflation stabilization plans involving currency reforms, price controls, and other measures.
- 1990s – It adopted a currency board (peso-dollar peg).
- 2001-2002 – It defaulted on its debts and abandoned the peso-dollar peg.

Brazil
- 1980s – It suffered runaway inflation and multiple failed attempts at stabilization accompanied by currency reforms.
- 1990s – It introduced a new currency (the real pegged to the dollar), defended it with high interest rates, and decreased inflation under 10%.

Chile
- 1980s – It implemented more reforms and used a crawling peg type of exchange rate regime to bring inflation down gradually.
- 1990-1997 – It enjoyed an average growth rate of more than 8% per year and a 20% inflation decrease.

East Asia: Success and Crisis

The East Asian Economic Miracle
Until 1997 the countries of East Asia were having very high growth rates. What are the ingredients for the success of the East Asian Miracle?
- High saving and investment rates
- Strong emphasis on education
- Stable macroeconomic environment
- Free from high inflation or major economic slumps
- High share of trade in GDP

Asian Weaknesses
Three weaknesses in the Asian economies’ structures became apparent with the 1997 financial crisis:
1. Productivity: Rapid growth of production inputs but little increase in the output per unit of input
2. Banking regulation: Poor state of banking regulation
3. Legal framework: Lack of a good legal framework for dealing with companies in trouble

The Asian Financial Crisis
It started on July 2, 1997 with the devaluation of the Thai baht. The sharp drop in the Thai currency was followed by speculation against the currencies of: Malaysia, Indonesia, and South Korea. All of the afflicted countries except Malaysia turned to the IMF for assistance. The downturn in East Asia was “V-shaped”: after the sharp output contraction in 1998, growth returned in 1999 as depreciated currencies spurred higher exports.

Crises in Other Developing Regions

Russia’s Crisis
- 1989 – It embarked on transitions from centrally planned economic allocation to the market. These transitions involved: rapid inflation, steep output declines, and unemployment.
- 1997 – It managed to stabilize the ruble and reduce inflation with the help of IMF credits.
- 2000 – It enjoyed a rapid growth rate.
Table 22-6: Real Output Growth and Inflation: Russia and Poland, 1991-2000 (percent per year)

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td><strong>Real Output Growth</strong></td>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Russia</td>
<td>−5.4</td>
<td>−19.4</td>
<td>−10.4</td>
<td>−11.6</td>
<td>−4.2</td>
<td>−3.4</td>
<td>0.9</td>
<td>−6.9</td>
<td>3.2</td>
<td>7.5</td>
</tr>
<tr>
<td>Poland</td>
<td>−7.0</td>
<td>2.6</td>
<td>4.3</td>
<td>5.2</td>
<td>6.3</td>
<td>6.0</td>
<td>8.8</td>
<td>4.8</td>
<td>4.1</td>
<td>4.1</td>
</tr>
<tr>
<td><strong>Inflation Rate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Russia</td>
<td>92.7</td>
<td>1,352.0</td>
<td>875.0</td>
<td>307.8</td>
<td>197.0</td>
<td>47.6</td>
<td>14.7</td>
<td>27.7</td>
<td>85.7</td>
<td>20.8</td>
</tr>
<tr>
<td>Poland</td>
<td>79.3</td>
<td>43.0</td>
<td>35.3</td>
<td>32.2</td>
<td>27.9</td>
<td>19.9</td>
<td>14.9</td>
<td>11.8</td>
<td>7.3</td>
<td>10.1</td>
</tr>
</tbody>
</table>

Brazil’s 1999 Crisis
It had a public debt problem. It devalued the real by 8% in January 1999 and then allowed it to float. The real lost 40% of its value against the dollar. It struggled to prevent the real from going into a free fall and as a result it entered into a recession. The recession was short lived, inflation did not take off, and financial-sector collapse was avoided.

Argentina’s 2001-2002 crises
Its rigid peg of its peso to the dollar proved painful as the dollar appreciated in the foreign exchange market.
- 2001 – It restricted residents’ withdrawals from banks in order to stem the run on the peso, and then it stopped payment on its foreign debts.
- 2002 – It established a dual exchange rate system and a single floating-rate system for the peso.

Lessons of Developing Country Crises
The lessons from developing country crises are summarized as:
1. Choosing the right exchange rate regime
2. The central importance of banking
3. The proper sequence of reform measures
4. The importance of contagion

Reforming the World’s Financial “Architecture”
The Asian crisis convinced nearly everyone of an urgent need for rethinking international monetary relations because of two reasons:
1. The fact that the East Asian countries had few apparent problems before their crisis struck
2. The apparent strength of contagion through the international capital markets

Capital Mobility and the Trilemma of the Exchange Rate Regime
The macroeconomic policy trilemma for open economies:
- Independence in monetary policy
- Stability in the exchange rate
- Free movement of capital

Only two of the three goals can be reached simultaneously. Exchange rate stability is more important for developing than developed countries.

Reforming the World’s Financial “Architecture”

Figure 22-4: The Policy Trilemma for Open Economies

Proposals to reform the international architecture can be grouped as preventive measures or as ex-post measures.

“Prophylactic” Measures
Among preventive measures are:
- More “transparency”
- Stronger banking systems
- Enhanced credit lines
- Increased equity capital inflows relative to debt inflows

The effectiveness of these measures is controversial.

Coping with Crisis
The ex-post measures that have been suggested include:
- More extensive lending by the IMF
- Bankruptcy proceeding for the orderly resolution of creditor claims on developing countries that cannot pay in full.

A Confused Future
In the years to come, developing countries will experiment with:
- Floating exchange rates
- Capital controls
- Currency boards
- Abolition of national currencies and adoption of the dollar or euro for domestic transactions

Summary
There are vast differences in per-capita income between countries at different stages of economic development. Because many developing economies offer potentially rich opportunities for investment, it is natural that they have current account deficits and borrow from richer countries. In the 1970s countries in Latin America entered an era of distinctly inferior macroeconomic performance. Despite their excellent records of high output growth and low inflation, key developing countries in East Asia were hit by currency depreciation in 1997. Proposals to reform the international architecture can be grouped as preventive measures or as ex-post measures. The architecture that will ultimately emerge is not at all clear.