

International Trade and International Finance

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Preface

International Economics has come in two separate parts that reflect the microeconomics and macroeconomics. ‘International Trade’ is based on microeconomics reasoning in terms of comparative advantage, economies of scale and product differentiation. ‘International Finance’ is largely conceptualized in terms of ‘open-economy macroeconomics’ which set the focus on exchange-rate regimes, stabilization policies and financial capital flows. The history of economics is full of different attempts to bridge the gaps between international trade and international finance.



The aim of “International Trade and International Finance” course is to give students a comprehensive understanding of the relevant economic theory and empirical evidence. The lectures will introduce some key ideas on international trade and finance. I will provide a formal discussion of the Ricardian model of trade, which contains one of the great insights in Economics that what matters for the gains from trade to occur is comparative advantage and not absolute advantage. I will introduce the Heckscher–Ohlin model of trade where endowment differences among countries play a key role in determining the pattern of trade. An important result in this discussion is that international trade can produce winners and losers.

Increasing returns and trade are essential concept of this course. I will focus on the Krugman model or the model of trade based on internal economies of scale in production. It shows how countries can gain from trade even in a world where countries have identical endowments and technologies, provided that production functions exhibit increasing returns to scale and consumers have a love for variety. I will also develop a discussion of the various commercial policy instruments, such as tariffs, quotas and export subsidies, that countries use to intervene in trade. Next, we will study the economics of preferential trading agreements, and the concluding chapter provides a history of multilateral trading agreements under the aegis of GATT

(General Agreement on Tariffs and Trade) and its evolution into the World Trade Organization (WTO).

Syllabus of (International Trade and International Finance)

0.0.0.0.1 * Section 1: Introduction to International Economics

- Lecture 1: Basics of International Economics
- Lecture 2: Introduction to International Trade
- Lecture 3: Reasons of International Trade
- Lecture 4: International Trade Models

0.0.0.0.2 * Section 2: International Trade Policy

- Lecture 5: The Instruments of Trade Policy
- Lecture 6: The Political Economy of Trade Policy
- Lecture 7: Trade Policy in Developing Countries: Part A
- Lecture 8: Trade Policy in Developing Countries: Part B

0.0.0.0.3 * Section 3: Open-Economy Macroeconomics

- Lecture 9: Globalization, Trade and the Environment
- Lecture 10: National Income Accounting and the Balance of Payments: Part A
- Lecture 11: National Income Accounting and the Balance of Payments: Part B
- Lecture 12: Money, Interest Rates, and Exchange Rates

0.0.0.0.4 * Section 4: International Macroeconomic Policy

- Lecture 13: International Monetary Systems
- Lecture 14: Financial Globalization
- Lecture 15: Developing Countries Growth, Crisis, and Reform

Course logistic

Class schedule in third quarter:

- Monday from 13:30 JST
- Thursday from 13:30 JST

Class room: **A108**, Eikokuji Campus, Kochi University of Technology

Grading

Your grade evaluation will depend on following three factors:

Performance	Weight
a. Attendance and answering the quizzes	20%
b. Answering the assignments (Five problem sets)	30%
c. Final examination (TBA)	50%

Instructor

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1 Basics of International Economics

1.1 What is International economics?

- International Economics is the study of economic interactions between countries.
- The world is rapidly globalizing and this is providing many opportunities and major challenges to the nations and people of the world.
- We will study international economics with a brief overview of the globalization revolution taking place in the world today.

1.2 What is international economics about?

- International economics consists of two main classifications:
 - International trade (Microeconomics)
 - International finance (Macroeconomics)

Comparision	International_Trade	International_Finance
Economics	Microeconomics	Macroeconomics
Employment	Full employment	Under employment
Savings	No savings	Savings
Trade	Balance	Imbalance
Money	Real transaction	Monetary transaction

1.3 Why study international trade?

- Production technologies do not flow easily across borders. There are massive differences in production technologies across countries.
- The use of some technologies is tied to human capital which can not be transferred across countries.
- Government institutions have a huge impact on the effectiveness of different technologies.

1.4 What are the subjects to focus in international trade?

- Seven themes recur throughout the study of international economics:
 - a. The gains from trade
 - b. The pattern of trade
 - c. Protectionism
 - d. The balance of payments
 - e. Exchange rate determination
 - f. International policy coordination
 - g. The international capital market

1.5 What is globalization?

- Increase in international transactions in markets for goods, services, and factors
- Growth and expanded scope of international institutions and organizations, for instance, UN, World Bank, IMF, WTO
- How can globalization be measured?
 - Trade flows: exports and imports of goods
 - Trade in services: transportation, healthcare, telecommunications, business services
 - Foreign asset ownership
 - Immigration
 - Price convergence: Possibility of trade may have important effects

1.6 Globalization and international trade

- Globalization is the process of interaction and integration among people, companies, and governments worldwide.
- Globalization has accelerated since the 18th century due to advances in transportation and communications technology.
- This increase in global interactions has caused a growth in international trade.

Text book: Paul Krugman, Maurice Obstfeld, and Marc Melitz, *International Economics*, 12th edition

2 Introduction to International Trade

2.1 The gains from trade

- Probably the most important single insight in all of international economics is that there are gains from trade that is, when countries sell goods and services to each other, this exchange is almost always to their mutual benefit.
- Although nations generally gain from international trade, it is quite possible that international trade may hurt particular groups within nations—in other words, that international trade will have strong effects on the distribution of income.

Trade can alter the distribution of income between workers and the owners of capital.

2.2 The pattern of trade

- Some aspects of the pattern of trade are easy to understand. Climate and resources clearly explain why Brazil exports coffee and Saudi Arabia exports oil.
- Why does Japan export automobiles, while the United States exports aircraft?
- There are various different models that try to explain the reason behind the pattern of trade.

“Who sells what to whom” have been a major question of international economics.

2.3 Determinants of trade

- After World War II the advanced democracies, led by the United States, pursued a broad policy of removing barriers to international trade; this policy reflected the view that free trade was a force not only for prosperity but also for promoting world peace.
- In 2016, Britain shocked the political establishment by voting to leave the European Union, which guarantees free movement of goods and people among its members.

Conflicts of interest within nations are usually more important in determining trade policy than conflicts of interest between nations.

2.4 Balance of payments

- The balance of payments (BOP) tracks international transactions. When funds go into a country, a credit is added to the balance of payments (“BOP”). When funds leave a country, a deduction is made.
- The balance of payments includes both the current account and capital/financial account.
 - The current account (CA) includes a nation’s net trade in goods and services, its net earnings on cross-border investments, and its net transfer payments.
 - The capital/financial account (FA) consists of a nation’s transactions in financial instruments and central bank reserves.
 - The sum of all transactions recorded in the balance of payments should be zero; however, exchange rate fluctuations and differences in accounting practices may hinder this in practice.

The BOP has become a central issue for the United States because the nation has run huge trade deficits every year since 1982.

2.5 What is trade?

- Buying and selling goods and services from other countries. Trade consist of imports (M) and exports (X). For instance, in the context of Japan:
 - The purchase of goods and services from abroad that leads to an outflow of currency from Japan – Imports (M)
 - The sale of goods and services to buyers from other countries leading to an inflow of currency to Japan – Exports (X)

2.6 Labor Intensive and capital intensive industries

2.6.1 What Is labor intensive industry?

- The term labor intensive refers to a process or industry that requires a large amount of labor to produce its goods or services.

- The degree of labor intensity is typically measured in proportion to the amount of capital required to produce the goods or services: the higher the proportion of labor costs required, the more labor-intensive the business.
- Labor-intensive industries include restaurants, hotels, agriculture, mining, as well as healthcare and caregiver.
- Less developed economies, as a whole, tend to be more labor-intensive. This situation is rather common because low income means that the economy or business cannot afford to invest in expensive capital.
- Before the industrial revolution, 90% of the workforce was employed in agriculture. Producing food was very labor-intensive.

2.6.2 What is capital intensive industry?

- Capital intensive refers to the production that requires higher capital investment such as financial resources, sophisticated machinery, more automated machines, the latest equipment, etc.
- Capital intensive industries pose higher barriers to entry as they require more investment in equipment and machinery to produce goods and services.
- Good examples of capital intensive industries include the oil refining industry, telecommunications industry, airline industry, and public transport authorities that maintain the roads, railways, trains, trams, etc.

2.6.3 Differences between capital intensive and labor intensive industries

- Capital intensive and labor intensive refer to types of production methods followed in the production of goods and services.
- Capital intensive production requires more equipment and machinery to produce goods; therefore, require a larger financial investment.
- Labor intensive refers to production that requires a higher labor input to carry out production activities in comparison to the amount of capital required.

Reference: Chapter 1- Introduction (Paul Krugman, Maurice Obstfeld, and Marc Melitz, *International Economics*, 12th edition)

3 Reasons of International Trade

3.1 Basic reasons behind trade?

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

3.2 Trade based on absolute advantage: Adam Smith

- The theory of absolute advantage, developed by Adam Smith. He started with the simple truth that for two nations to trade with each other voluntarily, both nations must gain. If one nation gained nothing or lost, it would simply refuse to trade. But how does this mutually beneficial trade take place, and from where do these gains from trade come?
- According to Adam Smith, trade between two nations is based on absolute advantage. When one nation is more efficient than (or has an absolute advantage over) another in the production of one commodity but is less efficient than (or has an absolute disadvantage with respect to) the other nation in producing a second commodity, then both nations can gain by each specializing in the production of the commodity of its absolute advantage and exchanging part of its output with the other nation for the commodity of its absolute disadvantage.
- By this process, resources are utilized in the most efficient way and the output of both commodities will rise. This increase in the output of both commodities measures the gains from specialization in production available to be divided between the two nations through trade.
- For example, because of climatic conditions, Canada is efficient in growing wheat but inefficient in growing bananas (hothouses would have to be used). On the other hand, Nicaragua is efficient in growing bananas but inefficient in growing wheat. Thus, Canada has an absolute advantage over Nicaragua in the cultivation of wheat but an absolute disadvantage in the cultivation of bananas. The opposite is true for Nicaragua.

- Under these circumstances, both nations would benefit if each specialized in the production of the commodity of its absolute advantage and then traded with the other nation. Canada would specialize in the production of wheat (i.e., produce more than needed domestically) and exchange some of it for (surplus) bananas grown in Nicaragua. As a result, both more wheat and more bananas would be grown and consumed, and both Canada and Nicaragua would gain.
- Thus, while the mercantilists believed that one nation could gain only at the expense of another nation and advocated strict government control of all economic activity and trade, Adam Smith (and the other classical economists who followed him) believed that all nations would gain from free trade and strongly advocated a policy of *laissez-faire* (i.e., as little government interference with the economic system as possible).
- Free trade would cause world resources to be utilized most efficiently and would maximize world welfare. There were to be only a few exceptions to this policy of *laissez-faire* and free trade. One of these was the protection of industries important for national defense.

In view of this belief, it seems paradoxical that today most nations impose many restrictions on the free flow of international trade.

3.2.1 Example of absolute advantage:

- one hour of labor time produces six kilograms of wheat in the United States but only one in the United Kingdom.
- On the other hand, one hour of labor time produces five units of cloths in the United Kingdom but only four in the United States.
- Thus, the United States is more efficient than, or has an absolute advantage over, the United Kingdom in the production of wheat, whereas the United Kingdom is more efficient than, or has an absolute advantage over, the United States in the production of cloth.
- With trade, the United States would specialize in the production of wheat and exchange part of it for British cloth. The opposite is true for the United Kingdom.

Table 3.1: Absolute advantage

	USA	UK
Wheat	6	1
Cloth	4	5

Absolute advantage, however, can explain only a very small part of world trade today, such as some of the trade between developed and developing countries. Most of world trade, especially trade among developed countries, could not be explained by absolute advantage.

3.3 Trade based on comparative advantage: David Ricardo

- David Ricardo, writing some 40 years after Smith, to truly explain the pattern of and the gains from trade with his law of comparative advantage.
- The law of comparative advantage is one of the most important laws of economics, with applicability to nations as well as to individuals and useful for exposing many serious fallacies in apparently logical reasoning.

3.3.1 The law of comparative advantage

- According to the law of comparative advantage, even if one nation is less efficient than the other nation in the production of both commodities, there is still a basis for mutually beneficial trade. The first nation should specialize in the production and export of the commodity in which its absolute disadvantage is smaller (this is the commodity of its comparative advantage) and import the commodity in which its absolute disadvantage is greater.
- The statement of the law can be clarified by looking at Table 3.2. The only difference between Tables 3.2 and 3.1 is that the United Kingdom now produces only two units of cloth per hour instead of five. Thus, the United Kingdom now has an absolute disadvantage in the production of both wheat and cloth with respect to the United States.
- However, since U.K. labor is half as productive in cloth but six times less productive in wheat with respect to the United States, the United Kingdom has a comparative advantage in cloth.
- On the other hand, the United States has an absolute advantage in both wheat and cloth with respect to the United Kingdom, but since its absolute advantage is greater in wheat (6:1) than in cloth (4:2), the United States has a comparative advantage in wheat.
- According to the law of comparative advantage, both nations can gain if the United States specializes in the production of wheat and exports some of it in exchange for British cloth. At the same time, the United Kingdom is specializing in the production and exporting of cloth.

Table 3.2: Comparative advantage

	USA	UK
Wheat	6	1
Cloth	4	2

3.4 Detail analysis 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.

3.4.1 Gains from trade due to comparative advantage

- 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.

Table 3.3: Example of comparative advantage

	Million roses	Thousand computers
U.S	-10	+100
Mexico	+10	-30
Total	0	+70

Reference: Chapter 2- Salvatore, D. (2016). *International Economics*. John Wiley & Sons.

»> Assignment 1

Hint:

- Suppose that the two countries are Home and Foreign and the two goods are Bread and Cloth. The lone factor of production is labor. The production of one unit of each good in each country requires a certain amount of labor which is called the unit labor requirement.
- Let's consider:
 - Home (H)
 - Foreign (F)
 - Bread (B)
 - Cloth (C)
 - Labor (L)
- We have the following information
 - In Home, $H_{LB} = 1$
 - In Home, $H_{LC} = 2$
 - In Foreign, $F_{LB} = 4$
 - In Foreign, $F_{LC} = 3$
- It is easily verified that Home is better at making both Bread and Cloth because Home requires less labor to produce a unit of Bread and a unit Cloth compared to Foreign.
- In other words, Home labor is more productive than Foreign in the production of both goods. Thus, Home has an absolute advantage in the production of both Bread and Cloth.

Recall that the opportunity cost of producing a good is the next best alternative foregone.

- Home produces one unit of Bread, it uses one unit of labor. The alternative use of labor in Home is to produce Cloth. How much Cloth can one unit of labor in Home produce? The answer is $1/2$, because each unit of Cloth requires two units of labor; so, one unit of labor can produce only $1/2$ Cloth.

Therefore,

- The opportunity cost of producing Bread in Home is $1/2$ Cloth
- The flip side of this is that the opportunity cost of producing Cloth in Home is 2 Bread
- For Foreign, the opportunity cost of producing Bread in Foreign is $4/3$ Cloth
- And the opportunity cost of producing Cloth in Foreign is $3/4$ Bread

Assignment 1:

- Suppose the unit labor requirements in Home and Foreign for the two goods Cloth and Wheat are as follows.
- Let's consider:
 - Home (H)
 - Foreign (F)
 - Cloth (C)
 - Wheat (W)
 - Labor (L)
- We have the following data:
 - In Home, $H_{LC} = 30$
 - In Home, $H_{LW} = 20$
 - In Foreign, $F_{LC} = 60$
 - In Foreign, $F_{LW} = 30$

Answer the following multiple choice questions based on the above.

- 1) Given the information in the table above, Home has an absolute advantage in
 - A) Cloth
 - B) Wheat
 - C) Both Cloth and Wheat
 - D) Neither

- 2) Given the information in the table above, the opportunity cost of Cloth in Home is
 - A) 1 Wheat
 - B) 2 Wheat
 - C) 1.5 Wheat
 - D) 4 Wheat

- 3) Given the information in the table above, the opportunity cost of Wheat in Foreign is
 - A) 1 Cloth
 - B) 2 Cloths
 - C) $1/2$ Cloth
 - D) 4 Cloths

- 4) Which of the following statements is true about the table above?
 - A) Home has a lower labor productivity in both Cloth and Wheat.
 - B) Foreign has a lower labor productivity in both Cloth and Wheat.
 - C) Home has a higher labor productivity in cloth, but Foreign has a higher labor productivity in Wheat.
 - D) Home has a lower labor productivity in cloth, but Foreign has a higher labor productivity in Wheat.

- 5) Which of the following statements is true about the table above?
 - A) Home has a comparative advantage in both Cloth and Wheat.
 - B) Foreign has a comparative advantage in both Cloth and Wheat.
 - C) Home has a comparative advantage in Cloth and Foreign in Wheat
 - D) Foreign has a comparative advantage in Cloth and Home in Wheat.

4 International Trade Models

4.1 Differences between absolute advantage and comparative advantage

Table 4.1: Differences between absolute and comparative advantage

	Absolute advantage	Comparative advantage
Definition	Best at production of good or service	Production of good or service at lower cost
Benefits	Resources are focused on specific production	Resources are focused on efficient production, therefore, saving resources
Cost	Cost is noticed but not made priority over production	Cost is the primary factor to make production
Production	All resource allocation goes into production	Resource allocation varies and the main focus is not only production but also opportunity cost
Trade benefits	Trade is not mutually beneficial for two countries	Trade is mutually beneficial for two countries
Economic concept	Strategic management concept	Economic concept
Proponents	Adam Smith	David Ricardo

4.2 The opportunity cost theory

- According to the opportunity cost theory, the cost of a commodity is the amount of a second commodity that must be given up to release just enough resources to produce one additional unit of the first commodity.
- The nation with the lower opportunity cost in the production of a commodity has a comparative advantage in that commodity.

- For example, if in the absence of trade the United States must give up two-thirds of a unit of cloth to release just enough resources to produce one additional unit of wheat domestically, then the opportunity cost of wheat is two-thirds of a unit of cloth.

4.3 The Production Possibility Frontier (PPF) under constant costs

- Opportunity costs can be illustrated with the production possibility frontier, or transformation curve. The production possibility frontier is a curve that shows the alternative combinations of the two commodities that a nation can produce by fully utilizing all of its resources with the best technology available to it.

Table 3.4: Production possibility frontier of Wheat and Cloth production

USA		UK	
Wheat	Cloth	Wheat	Cloth
180	0	60	0
150	20	50	20
120	40	40	40
90	60	30	60
60	80	20	80
30	100	10	100
0	120	0	120

- Table 3.4 gives the (hypothetical) production possibility schedules of wheat (in million kg/year) and cloth (in million units/year) for the United States and the United Kingdom.
- The United States and United Kingdom production possibility schedules given in Table 3.4 are graphed as production possibility frontiers in Figure 3.1. Each point on a frontier represents one combination of wheat and cloth that the nation can produce.

4.4 The Basis for and the Gains from Trade under Constant Costs

- In the absence of trade, a nation can only consume the commodities that it produces. As a result, the nation's production possibility frontier also represents its consumption frontier.
- In the absence of trade, the United States might choose to produce and consume combination A (90W and 60C) on its production possibility frontier (see Figure 2.2), and the United Kingdom might choose combination A' (40W and 40C).

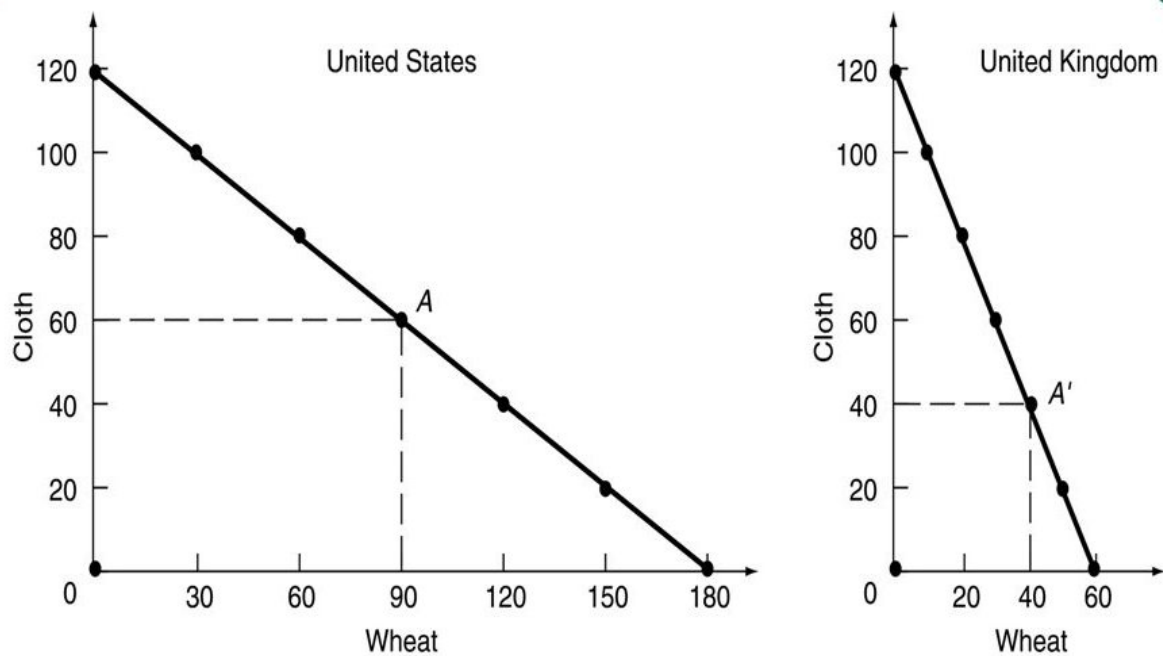


Figure 4.1: Figure 3.1: The Production Possibility Frontiers of the United States and the United Kingdom.

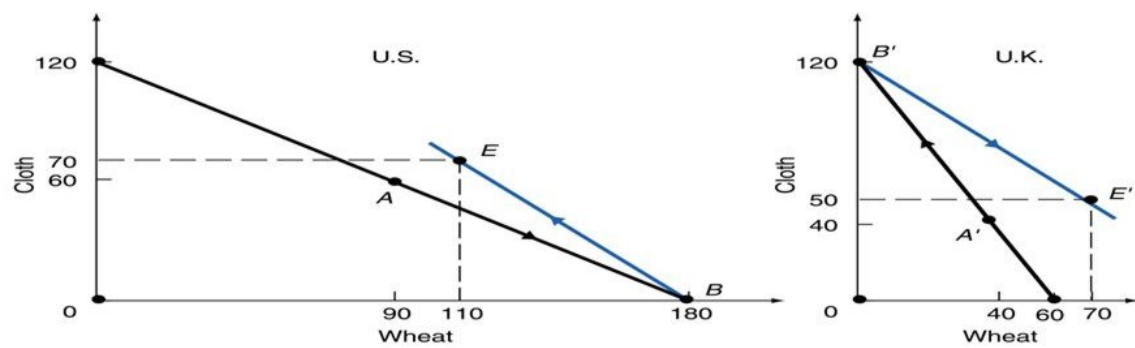


Figure 4.2: Figure 3.2: The gains from trade

- In the absence of trade, the United States produces and consumes at A , and the United Kingdom at A' . With trade, the United States specializes in the production of wheat and produces at B , while the United Kingdom specializes in the production of cloth and produces at B' . By exchanging 70W for 70C with the United Kingdom, the United States ends up consuming at E (and gains 20W and 10C), while the United Kingdom ends up consuming at E' (and gains 30W and 10C).
- The increased consumption of both wheat and cloth in both nations was made possible by the increased output that resulted as each nation specialized in the production of the commodity of its comparative advantage.

4.5 The Ricardian model of international trade

- The Ricardian model of international trade states that the main reason why countries trade is that different countries have different productivity (or technologies) for producing different goods and services.
- It shows how countries can gain from exporting goods that they are relatively better at making and importing goods that they are relatively worse at making.

4.5.1 The Ricardian theory

- The Ricardian theory of comparative advantage is based on the idea that if there are technological differences in the production of goods across countries,
- Countries can gain from trade by exporting goods for which the country has a lower opportunity cost of production and importing goods for which the country's opportunity costs of production are higher.
- The model can be understood using a two-country, two-good and one factor of production example.
- Suppose that the two countries are Home(h) and Foreign(f) and the two goods are Bread (b) and Cloth (c).
- The lone factor of production is labor (L).
- The production of one unit of each good in each country requires a certain amount of labor which is called the unit labor requirement.

5 The Instruments of Trade Policy

5.1 Key concepts

Term	Definition
Opportunity cost	The value of the next best alternative to any decision you make. For instance, the opportunity cost of watching movey is the hour of studying she gives up to do that
Growth	An increase in an economy's ability to produce goods and services over time; economic growth in the PPF model is illustrated by a shift out of the PPF
Contraction	A decrease in output that occurs due to the under-utilization of resources. In a graphical model of the PPF, a contraction is represented by moving to a point that is further away from, and on the interior of the PPF
Constant opportunity costs	when the opportunity cost of a good remains constant as output of the good increases, which is represented as a PPF curve that is a straight line
Increasing opportunity costs	when the opportunity cost of a good increases as output of the good increases, which is represented in a graph as a PPF that is bowed out from the origin
Productivity	(also called technology) the ability to combine economic resources; an increase in productivity causes economic growth even if economic resources have not changed, which would be represented by a shift out of the PPF

5.2 Production Possibility Frontier

- Production possibilities frontier (PPF) shows the maximum attainable combinations of two products that may be produced if we use our resources efficiently. Sometimes economists call this Production Possibilities Curve (PPC).
- PPFs can be used to demonstrate:
 - a) opportunity costs (trade-offs).
 - b) efficient production.
 - c) economic growth

- Understanding opportunity costs - The Shape of PPFs
 - Constant opportunity cost PPFs are
 - Linear lines. Opportunity cost is constant (the same) no matter where you produce.
 - Increasing opportunity cost PPFs are
 - Concave. As you keep increasing production, opportunity cost is increasing.
- The PPF with increasing costs

It is more realistic for a nation to face increasing rather than constant opportunity costs. Increasing opportunity costs mean that the nation must give up more and more of one commodity to release just enough resources to produce each additional unit of another commodity. Increasing opportunity costs result in a production frontier that is concave from the origin (rather than a straight line).

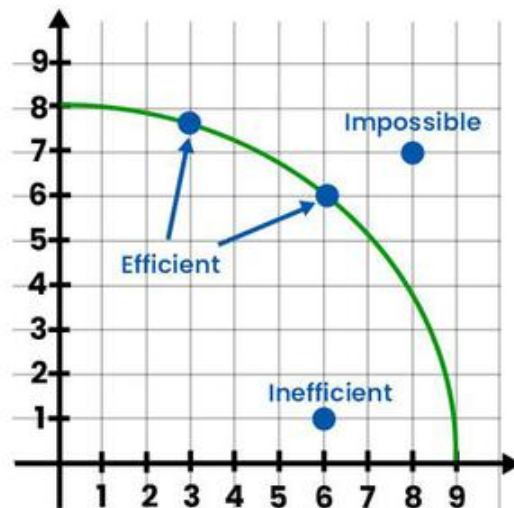


Figure 5.1: The PPF with increasing costs

5.3 The Production Possibilities Frontier and Social Choices

- Because society has limited resources (e.g., labor, land, capital, raw materials) at any point in time, there is a limit to the quantities of goods and services it can produce.

- Suppose a society desires two products, healthcare and education. This situation is illustrated by the production possibilities frontier in this graph.
- A Healthcare vs. Education Production Possibilities Frontier

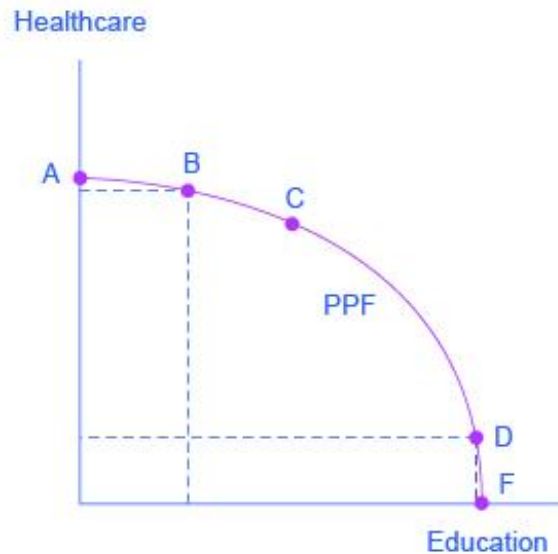


Figure 5.2: Healthcare vs. Education PPF

- In the graph, healthcare is shown on the vertical axis and education is shown on the horizontal axis. If the society were to allocate all of its resources to healthcare, it could produce at point A. But it would not have any resources to produce education.
- If it were to allocate all of its resources to education, it could produce at point F.
- Alternatively, the society could choose to produce any combination of healthcare and education shown on the production possibilities frontier.
- Society can choose any combination of the two goods on or inside the PPF. But it does not have enough resources to produce outside the PPF.
- Suppose society has chosen to operate at point B, and it is considering producing more education. the only way society can obtain more education is by giving up some healthcare. That is the tradeoff society faces.

5.4 The shape of the PPF and the law of diminishing returns

- The law of diminishing returns, which holds that as additional increments of resources are added to a certain purpose, the marginal benefit from those additional increments

will decline.

- For instance, when government spends a certain amount more on reducing crime, for example, the original gains in reducing crime could be relatively large. But additional increases typically cause relatively smaller reductions in crime, and paying for enough police and security to reduce crime to nothing at all would be tremendously expensive.
- The curvature of the production possibilities frontier shows that as additional resources are added to education, moving from left to right along the horizontal axis, the original gains are fairly large, but gradually diminish. Similarly, as additional resources are added to healthcare, moving from bottom to top on the vertical axis, the original gains are fairly large, but again gradually diminish. In this way, the law of diminishing returns produces the outward-bending shape of the production possibilities frontier.

5.5 Productive Efficiency and Allocative Efficiency

The production possibilities frontier can illustrate two kinds of efficiency: productive efficiency and allocative efficiency. The following graph illustrates these ideas using a production possibilities frontier between healthcare and education.

- Productive efficiency means that, given the available inputs and technology, it is impossible to produce more of one good without decreasing the quantity that is produced of another good. All choices on the PPF in this graph, including A, B, C, D, and F, display productive efficiency. As a firm moves from any one of these choices to any other, either healthcare increases and education decreases or vice versa. However, any choice inside the production possibilities frontier is productively inefficient and wasteful because it is possible to produce more of one good, the other good, or some combination of both goods.
- Allocative efficiency means that the particular mix of goods a society produces represents the combination that society most desires. How to determine what a society desires can be a controversial question, and is usually discussed in political science, sociology, and philosophy classes as well as in economics. At its most basic, allocative efficiency means producers supply the quantity of each product that consumers demand. Only one of the productively efficient choices will be the allocatively efficient choice for society as a whole.

5.6 Heckscher–Ohlin model of trade

- We now go one step further and explain the reason, or cause, for the difference in relative commodity prices and comparative advantage between the two nations.

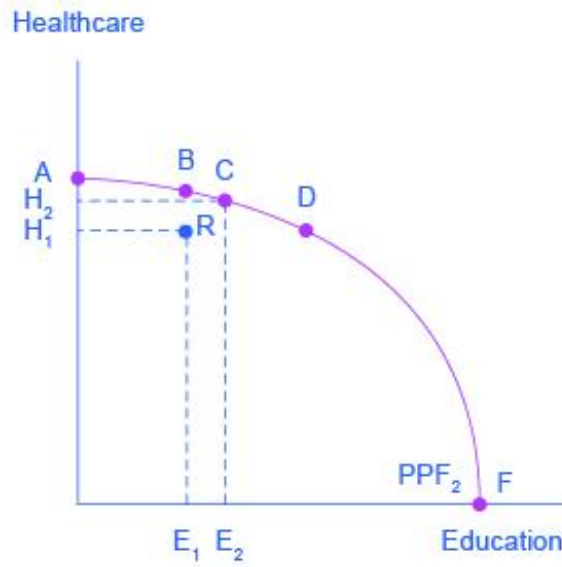


Figure 5.3: Productive and Allocative Efficiency

- Questions were left largely unanswered by Ricardo. According to Ricardo, comparative advantage was based on the difference in the productivity of labor among nations, but he provided no explanation for such a difference in productivity, except for possible differences in climate.
- Named after two Swedish economists, Eli Heckscher and Bertil Ohlin, the Heckscher–Ohlin model studies the pattern of production and trade that arises when countries have different endowments of factors of production, such as labor, capital and land.
- The Heckscher–Ohlin model of trade states that endowment differences among countries play a key role in determining the pattern of trade.

Heckscher–Ohlin Theorem. A country has a comparative advantage in the good that is relatively intensive in the country's relatively abundant factor.

5.7 The Krugman model of trade

- The Krugman model or the model of trade based on internal economies of scale in production.

- It shows how countries can gain from trade even in a world where countries have identical endowments and technologies, provided that production functions exhibit increasing returns to scale and consumers have a love for variety.

5.8 The gravity model

- Let's begin by describing who trades with whom. An empirical relationship known as the gravity model helps to make sense of the value of trade between any pair of countries and sheds light on the impediments that continue to limit international trade even in today's global economy.
- Three of the top 15 U.S. trading partners are European nations: Germany, the United Kingdom, and France. Why does the United States trade more heavily with these three European countries than with others? The answer is that these are the three largest European economies. That is, they have the highest values of gross domestic product (GDP), which measures the total value of all goods and services produced in an economy.

There is a strong empirical relationship between the size of a country's economy and the volume of both its imports and its exports.

- The basic form of the gravity equation is as follows:

$$T_{ij} = \frac{GDP_i^\alpha GDP_j^\beta}{D_{ij}^\theta}$$

Here,

T_{ij} indicates bilateral trade between country i , and j

GDP_i indicates the economic size of i , measured by gross domestic product

D_{ij} indicates the bilateral distance between the two countries

The parameters are α , β , and θ

6 The Political Economy of Trade Policy

Previous lectures have answered the question, “Why do nations trade?” by describing the causes and effects of international trade and the functioning of a trading world economy. This lecture examines the policies that governments adopt toward international trade, policies that involve a number of different actions. These actions include *taxes*, *subsidies*, *legal limits* on the value or volume of particular imports and other measures.

The chapter thus provides a framework for understanding the effects of the most important instruments of trade policy.

6.1 Basic Tariff Analysis

A tariff is a tax levied when a good is imported. There are various types of tariff.

- *Specific tariff* are levied as a fixed charge for each unit of goods imported (for example, \$3 per barrel of oil).
- *Ad valorem* tariffs are taxes that are levied as a fraction of the value of the imported goods (for example, a 25 percent U.S. tariff on imported trucks).

Tariffs are the oldest form of trade policy and have traditionally been used as a source of government income. Their true purpose is to provide revenue and to protect particular domestic sectors.

The importance of tariffs has declined in modern times because modern governments usually prefer to protect domestic industries through a variety of non-tariff barriers, such as:

- Import quotas (limitations on the quantity of imports)
- Export restraints (limitations on the quantity of exports—usually imposed by the exporting country at the importing country’s request).

Nonetheless, an understanding of the effects of a tariff remains vital for understanding other trade policies.

6.2 Political economy and trade policy

In 2008, several developing countries were forced to reduce crop prices domestically. To increase domestic supply for food products, countries like Thailand, Russia, and Ukraine chose to restrict food exports. Such a trade policy was not only politically improper, as it serves only one country's interest, but also economically counter-productive. For example, farmers in Ukraine dumped around €90 million worth of grain as they harvested more than they could supply domestically, due to the export restrictions, while the world supply was insufficient.

Banning exports may have reduced domestic prices, but importers had to look elsewhere for sources of supply, creating a rise in global crop prices. Thus, such policies produce more costs than benefits as higher the price, the greater the incentive to hoard, which create shifts in prices. Clearly, government policies reflect intentions that go beyond simple measures of cost and benefit.

6.2.1 Free Trade and Efficiency

The efficiency case for free trade is simply the reverse of the cost-benefit analysis of a tariff. Figure 6a shows the basic point once again for the case of a small country that cannot influence foreign export prices. A tariff causes a net loss to the economy measured by the area of the two triangles; it does so by distorting the economic incentives of both producers and consumers. Conversely, a move to free trade eliminates these distortions and increases national welfare.

In the modern world, for reasons we will explain later in this chapter, tariff rates are generally low and import quotas relatively rare. As a result, estimates of the total costs of distortions due to tariffs and import quotas tend to be modest in size. Table 6a shows an estimate of the gains from a move to worldwide free trade, measured as a percentage of GDP. For the world as a whole, according to these estimates, protection costs less than 1 percent of GDP. The gains from free trade are somewhat smaller for advanced economies such as the United States and Europe and somewhat larger for poorer “developing countries.”

Table 6.1: Table 6.1: Benefits of Free Trade (Source: William Cline, Trade Policy and Global Poverty)

Country or region	Growth of GDP in percentage
United States	0.57
European Union	0.61
Japan	0.85
Developing Countries	1.4
World	0.93

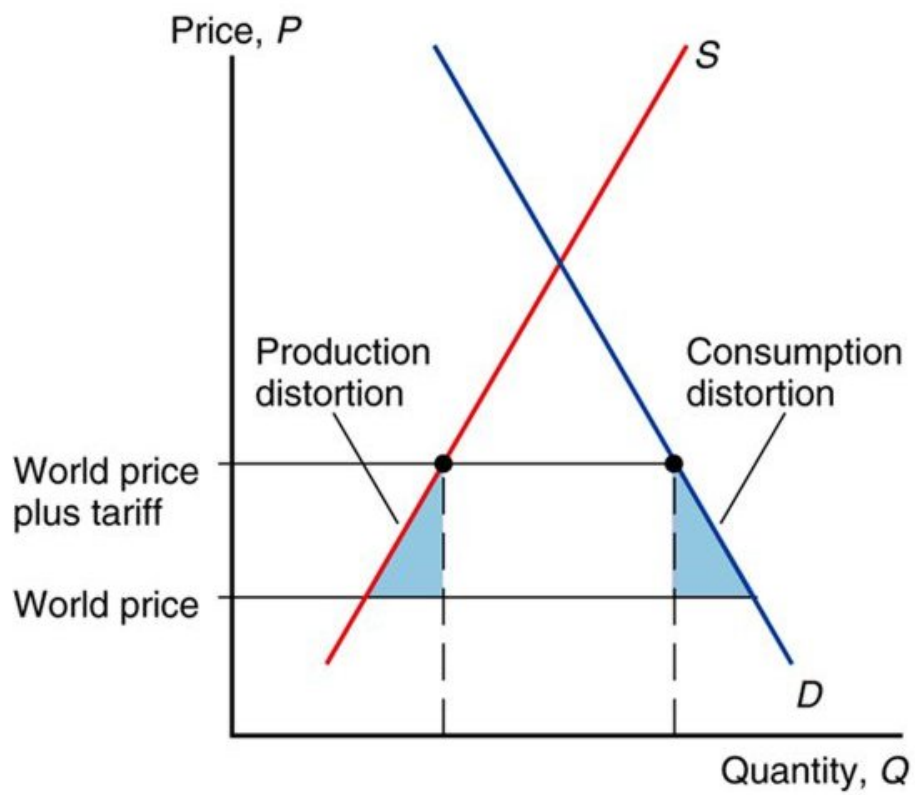


Figure 6.1: Figure 6a: Efficiency of free trade

Because tariff rates are already low for most of the countries, the estimated benefit to free trade is not significantly high for many nations and regions of the world.

Table 6.2: Table 6b: Effects of Alternative Trade Policies

Policy	Tariff	Export Subsidy	Import Quota	Voluntary Export Restraint
Producer benefit	Increases	Increases	Increases	Increases
Consumer benefit	Falls	Falls	Falls	Falls
Government revenue	Increases	Falls	No change	No change
Overall national welfare	Ambiguous (falls for small country)	Falls	Ambiguous (falls for small country)	Falls

All four trade policies benefit producers and hurt consumers. The effects of the policies on economic welfare are at best ambiguous; two of the policies definitely hurt the nation as a whole, while tariffs and import quotas are potentially beneficial only for large countries that can drive down world prices.

6.3 Some other Instruments of Trade Policy

Tariffs are the simplest trade policies, but in the modern world, most government intervention in international trade takes other forms, such as:

- Export subsidies
- Import quotas
- Voluntary export restraints
- Local content requirements

Fortunately, once we have understood tariffs, it is not too difficult to understand these other trade instruments.

6.3.1 Export Subsidies

An export subsidy is a payment to a firm or individual that ships a good abroad. Like a tariff, an export subsidy can be either specific (a fixed sum per unit) or ad valorem (a proportion of the value exported). When the government offers an export subsidy, shippers will export the good up to the point at which the domestic price exceeds the foreign price by the amount of the subsidy.

6.3.2 Import Quotas

An import quota is a direct restriction on the quantity of some good that may be imported. The restriction is usually enforced by issuing licenses to some group of individuals or firms. For example, the United States has a quota on imports of foreign cheese. The only firms allowed to import cheese are certain trading companies, each of which is allocated the right to import a maximum number of pounds of cheese each year; the size of each firm's quota is based on the amount of cheese it imported in the past.

6.3.3 Voluntary Export Restraints

A variant on the import quota is the voluntary export restraint (VER), also known as a voluntary restraint agreement (VRA). A VER is a quota on trade imposed from the exporting country's side instead of the importer's. The most famous example is the limitation on auto exports to the United States enforced by Japan after 1981.

6.3.4 Local Content Requirements

A local content requirement is a regulation that requires some specified fraction of a final good to be produced domestically. In some cases, this fraction is specified in physical units. In other cases, the requirement is stated in value terms by requiring that some minimum share of the price of a good represent domestic value added. Local content laws have been widely used by developing countries trying to shift their manufacturing base from assembly back into intermediate goods.

»> Assignment 2

1. Use your knowledge about trade policy to evaluate each of the following statements. Write at least 150 words for each of the following questions.
 - a. “Tariffs on imported goods will increase domestic price, leading to high unemployment.”
 - b. “High tariffs and quotas can result in trade wars between nations.”
 - c. “Smartphone manufacturing jobs are heading back to United States because wages started to rise in China. As a result, we should implement tariffs on smartphones equal to the difference between U.S. and China’s wage rates.”
2. If tariffs are already in place as a trade policy, why might a country choose to apply also non-tariff barriers as another way to control the amount of trade that they conduct with other countries?

7 Trade Policy in Developing Countries: part A

7.1 Governments directly influence some trade policy instruments

Governments influence trade in many other ways. We list some of them briefly.

7.1.1 Export credit subsidies

This is like an export subsidy except that it takes the form of a subsidized loan to the buyer. The United States, like most other countries, has a government institution, the Export-Import Bank, devoted to providing at least slightly subsidized loans to aid exports.

7.1.2 National procurement

Purchases by the government or strongly regulated firms can be directed toward domestically produced goods even when these goods are more expensive than imports. The classic example is the European telecommunications industry. For instance, in Europe, government-owned telephone companies buy from domestic suppliers even when the suppliers charge higher prices than suppliers in other countries.

7.1.3 Red-tape barriers

Sometimes a government wants to restrict imports without doing so formally. Fortunately or unfortunately, it is easy to twist normal health, safety, and customs procedures in order to place substantial obstacles in the way of trade.

7.2 The free trade agreements (FTA)

Free trade agreements are treaties that regulate the tariffs, taxes, and duties that countries impose on their imports and exports. The most well-known U.S. regional trade agreement is the United States-Mexico-Canada Agreement (USMCA) which replaced the North America Free Trade Agreement (NAFTA) effective July 1, 2020.

Currently, the United States has 14 FTAs with 20 countries. FTAs can help your company to enter and compete more easily in the global marketplace through zero or reduced tariffs and other provisions. While the specifics of each FTA vary, they generally provide for the reduction of trade barriers and the creation of a more predictable and transparent trading and investment environment. This makes it easier and cheaper for U.S. companies to export their products and services to trading partner markets.

Notes:

Free trade agreements reduce or eliminate barriers to trade across international borders.

Free trade is the opposite of trade protectionism.

In the U.S. and the E.U., free trade agreements do not come without regulations and oversight.

7.2.1 Advantages of Free Trade Agreements

- Increased Economic Growth
- More Dynamic Business Climate
- Lower Government Spending
- Industry Expertise
- Technology Transfer

7.2.2 Disadvantages of Free Trade Agreements

- Increased Job Outsourcing
- Theft of Intellectual Property
- Crowding Out Domestic Industries
- Poor Working Conditions
- Reduced Tax Revenue

- Degradation of Natural Resources

7.2.3 What is the difference between free trade and fair trade?

Although these terms are often confused, there are significant differences between free trade and fair trade. Free trade agreements are aimed at fostering open trade between nations to improve economic growth among all involved parties. The fair trade movement is focused on fostering economic equity on a global scale so that the workers who make goods in other countries receive fair wages and improve their lives and communities.

7.3 Trade and Developing Countries

So far, we have analyzed the instruments of trade policy and its objectives without specifying the context—that is, without saying much about the country undertaking these policies. Each country has its own distinctive history and issues, but in discussing economic policy, one difference between countries becomes obvious: their income levels.

7.3.1 What is developing country?

A developing country is a sovereign state with a lesser developed industrial base and a lower Human Development Index (HDI) relative to other countries. However, this definition is not universally agreed upon. There is also no clear agreement on which countries fit this category. The term low and middle-income country (LMIC) is often used interchangeably but refers only to the economy of the countries.

- The classification of countries based on World Bank:

<https://blogs.worldbank.org/opendata/new-world-bank-country-classifications-income-level-2022-2023>

- The classification of countries based on UN:

https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/WESP2022_AN NEX.pdf

Why are some countries so much poorer than others?

Why have some countries that were poor a generation ago succeeded in making dramatic progress, while others have not?

Trade policies in many developing countries were strongly influenced by the beliefs that the key to economic development was the creation of a strong manufacturing sector, and that the best way to create that manufacturing sector was to protect domestic manufacturers from international competition.

7.4 The Infant Industry Argument

- According to the infant industry argument, developing countries have a potential comparative advantage in manufacturing, but new manufacturing industries in developing countries cannot initially compete with well-established manufacturing in developed countries.
- To allow manufacturing to get a toehold, then, governments should temporarily support new industries until they have grown strong enough to meet international competition. Thus, it makes sense, according to this argument, to use tariffs or import quotas as temporary measures to get industrialization started.

7.4.1 Problems with the Infant Industry Argument

The infant industry argument seems highly plausible, and in fact it has been persuasive to many governments. Yet economists have pointed out many pitfalls in the argument, suggesting that it must be used cautiously.

- First, it is not always a good idea to try to move today into the industries that will have a comparative advantage in the future. Suppose a country that is currently labor-abundant is in the process of accumulating capital. When it accumulates enough capital, it will have a comparative advantage in capital-intensive industries. However, that does not mean it should try to develop these industries immediately.
- Second, protecting manufacturing does no good unless the protection itself helps make industry competitive. For example, Pakistan and India have protected their manufacturing sectors for decades and have recently begun to develop significant exports of manufactured goods. The goods they export, however, are light manufactures like textiles, not the heavy manufactures that they protected; a good case can be made that they would have developed their manufactured exports even if they had never protected manufacturing.
- More generally, the fact that it is costly and time-consuming to build up an industry is not an argument for government intervention unless there is some domestic market failure.

Reference: Chapter 11- Trade Policy in Developing Countries (Paul Krugman, Maurice Obstfeld, and Marc Melitz, *International Trade: Theory and Policy*, 11th edition)

8 Trade Policy in Developing Countries: part B

8.1 Prospects of International Trade of Developing Countries

- Developing countries have become major players in global trade. Their relative weight has grown enormously, mainly due to China's meteoric rise as an exporter. Though they partly reflect surging oil prices, increasing exports from the Middle East and North Africa (MENA), Eastern Europe, and Central Asia have further increased the weight of developing countries in world trade.
- GDP projections suggest that the share of world trade held by developing countries will expand further, more than doubling over the next 40 years and reaching nearly 70 percent by 2050.

8.1.1 Trade Liberalization since 1985

Beginning in the mid-1980s, a number of developing countries moved to lower tariff rates and removed import quotas and other restrictions on trade. The shift of developing countries toward freer trade is the big trade policy story of the past two and a half decades.

After 1985, many developing countries reduced tariffs, removed import quotas, and in general opened their economies to import competition. Figure 7a shows trends in tariff rates for an average of all developing countries and for two important developing countries, India and Brazil, which once relied heavily on import substitution as a development strategy. As you can see, there has been a dramatic fall in tariff rates in those two countries. Similar if less drastic changes in trade policy took place in many other developing countries.

Trade liberalization in developing countries had two clear effects. One was a dramatic increase in the volume of trade. Figure 7b plots exports and imports of developing countries, measured as percentages of GDP, since 1970. As you can see, the share of trade in GDP has tripled over that period, with most of the growth happening after 1985.

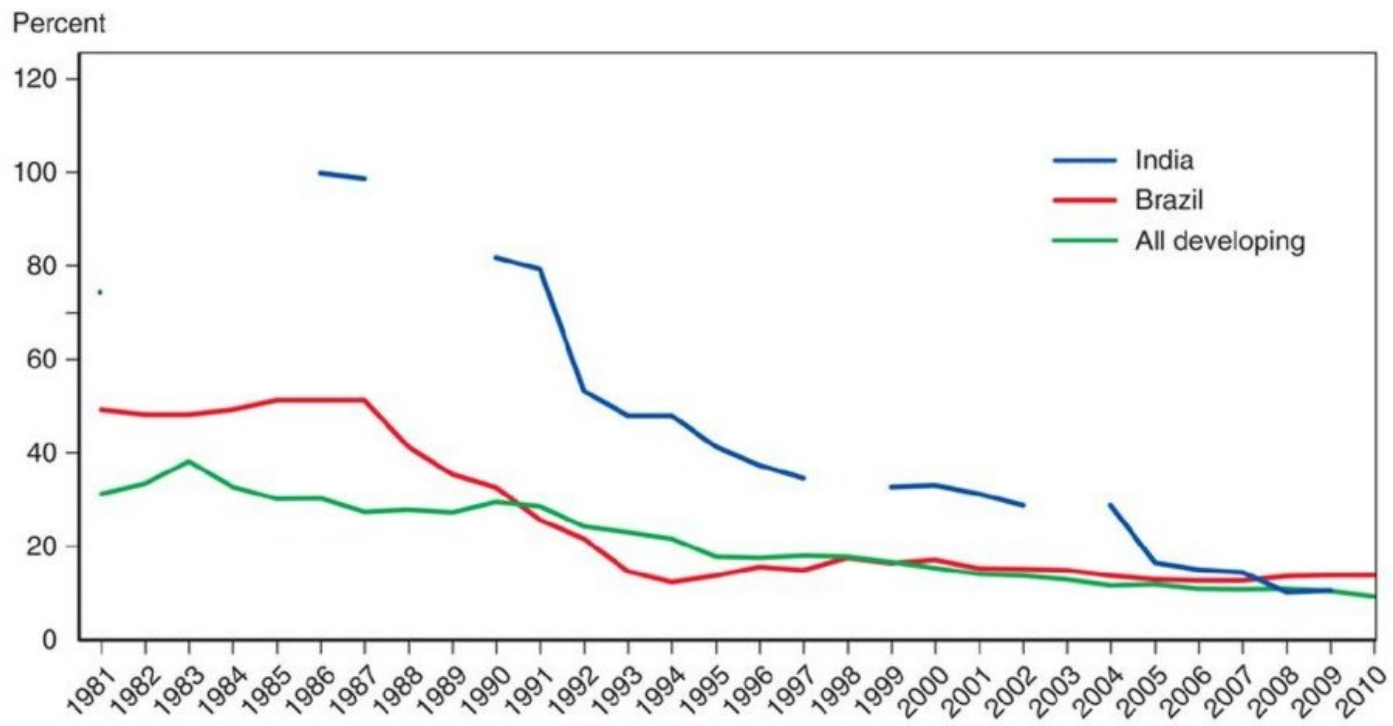


Figure 8.1: Figure 7a: Tariff Rates in Developing Countries

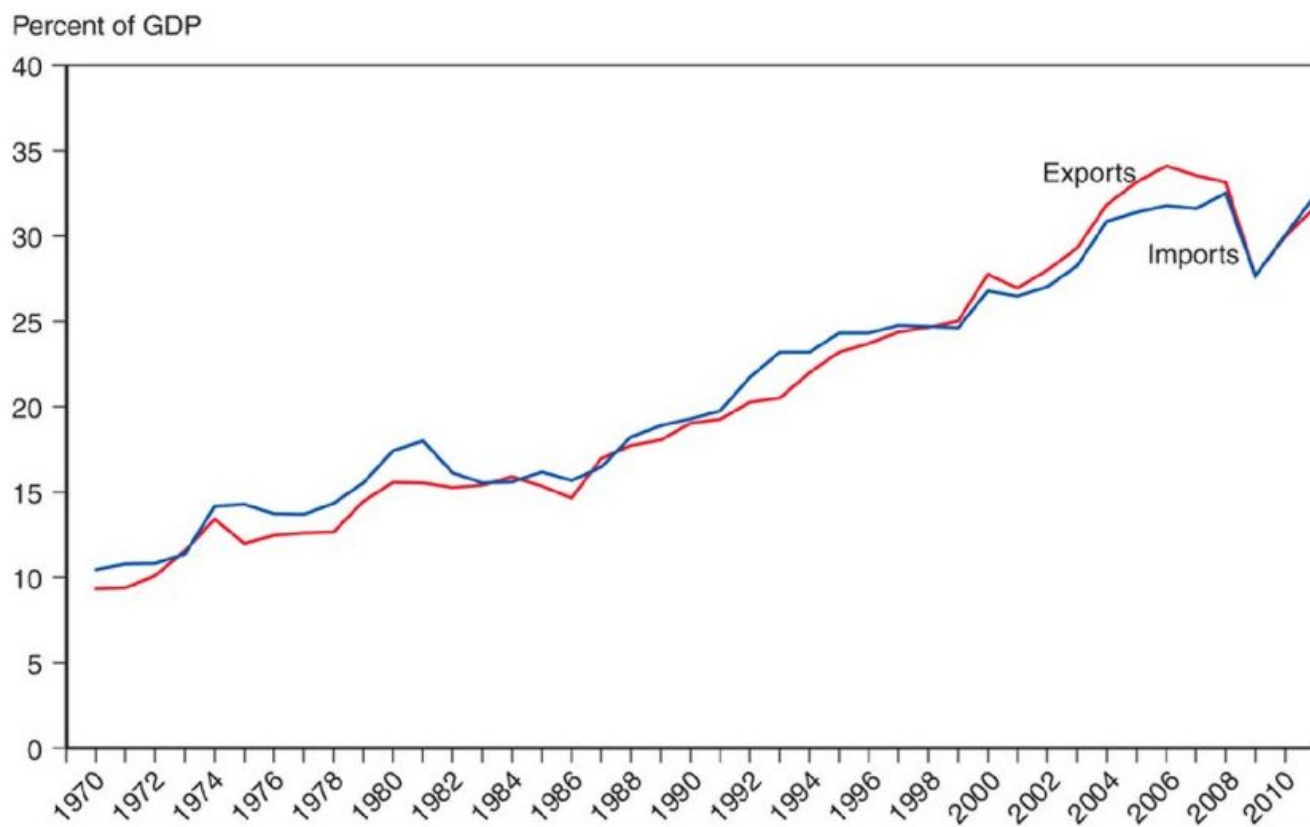


Figure 8.2: Figure 7b: The Growth of Developing-Country Trade

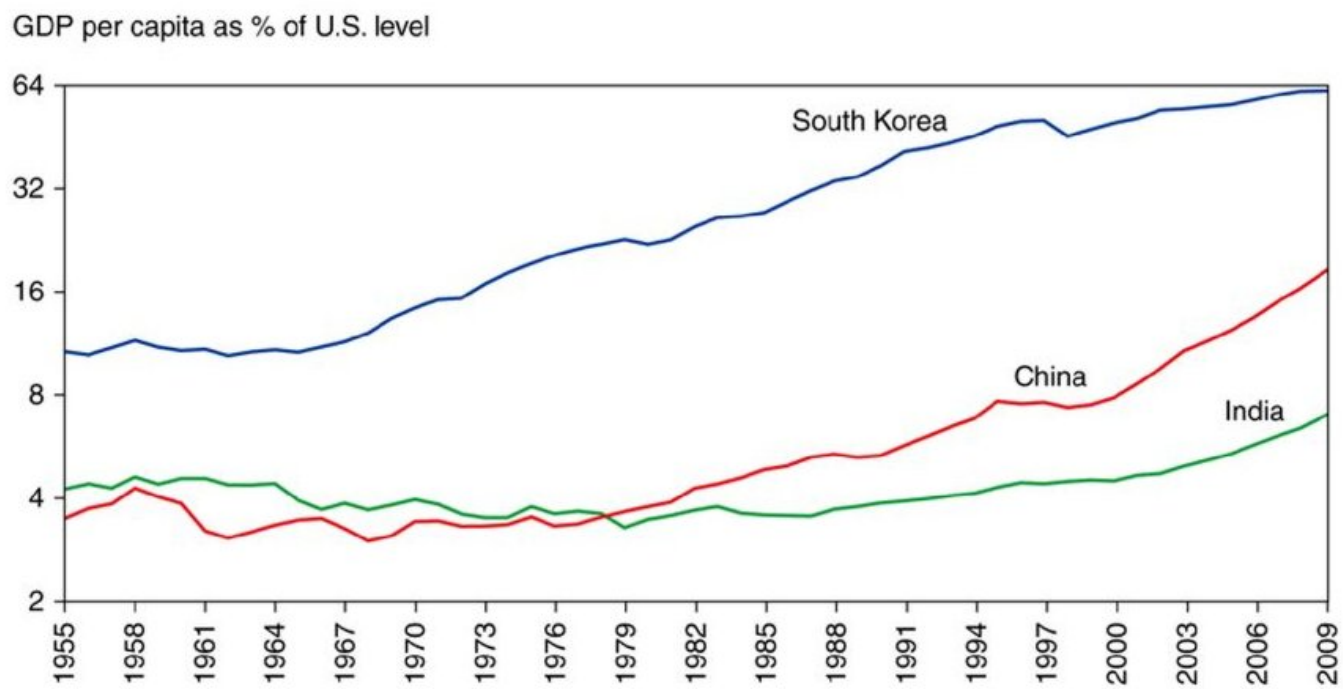


Figure 8.3: Figure 7c: The Asian Takeoff

8.1.2 Trade and Growth: Takeoff in Asia

Figure 7c illustrates the Asian takeoff by showing the experiences of three countries: South Korea, the biggest of the original group of Asian “tigers”; China; and India. In each case, we show per-capita GDP as a percentage of the U.S. level, an indicator that highlights the extent of these nations’ economic “catchup.” As you can see, South Korea began its economic ascent in the 1960s, China at the end of the 1970s, and India circa 1990.

8.2 Case: India’s economic growth

India, with a population of more than 1.1 billion people, is the world’s second-most-populous country. It’s also a growing force in world trade especially in new forms of trade that involve information rather than physical goods. The Indian city of Bangalore has become famous for its growing role in the global information technology industry.

Yet a generation ago, India was a very minor player in world trade. In part this was because the country’s economy performed poorly in general: Until about 1980, India eked out a rate of economic growth—sometimes mocked as the “Hindu rate of growth”—that was only about 1 percentage point higher than population growth. This slow growth was widely attributed to the stifling effect of bureaucratic restrictions. Observers spoke of a “license Raj”: Virtually any kind of business initiative required hard-to-get government permits, which placed a damper on investment and innovation. And India’s sluggish economy participated little in world trade.

After the country achieved independence in 1948, its leaders adopted a particularly extreme form of import-substituting industrialization as the country’s development strategy: India imported almost nothing that it could produce domestically, even if the domestic product was far more expensive and of lower quality than what could be bought abroad. High costs, in turn, crimped exports. So India was a very “closed” economy. In the 1970s, imports and exports averaged only about 5 percent of GDP, close to the lowest levels of any major nation.

Then everything changed. India’s growth accelerated dramatically: GDP per-capita, which had risen at an annual rate of only 1.3 percent from 1960 to 1980, has grown at close to 4 percent annually since 1980. And India’s participation in world trade surged as tariffs were brought down and import quotas were removed. In short, India has become a high-performance economy. It’s still a very poor country, but it is rapidly growing richer and has begun to rival China as a focus of world attention.

The big question, of course, is why India’s growth rate has increased so dramatically. That question is the subject of heated debate among economists. Some have argued that trade liberalization, which allowed India to participate in the global economy, was crucial. Others point out that India’s growth began accelerating around 1980, whereas the big changes in trade policy didn’t occur until the beginning of the 1990s.

Whatever caused the change, India's transition has been a welcome development. More than a billion people now have much greater hope for a decent standard of living.

8.2.1 The Rising Weight of Developing Countries in World Trade

- Developing countries are already playing an increasing role in world trade. In 2006, they accounted for 30 percent of world exports, up from 19.5 percent in 1996.
- The share of exports held by the BRIC economies (Brazil, Russia, India, and China) more than doubled, rising from 6 percent to 12.4 percent. China accounted for a significant portion of this rise—its claim of world exports nearly tripled from 2.7 percent to 7.6 percent.

Trade and investment have risen not only between the rich countries of the North and the developing economies of the South, but also among countries in the South.

8.2.2 The Rise of South-South Trade

- Over the past two decades, trade and investment have risen not only between the rich countries of the North and the developing economies of the South, but also among countries in the South, particularly—though not exclusively—involving Asian nations.
- China and India significantly increased imports from MENA and SSA, partly due to rising commodity demand, with China absorbing \$32.5 billion in exports from them in 2006, up from just \$545 million in 1996.
- Bilateral trade between China and India has grown increasingly significant as well, with exports from China to India jumping from \$686 million to \$14.5 billion.

Reference: Chapter 11- Trade Policy in Developing Countries (Paul Krugman, Maurice Obstfeld, and Marc Melitz, *International Trade: Theory and Policy*, 11th edition)

9 Globalization, Trade and the Environment

Concerns about human impacts on the environment are growing in much of the world. In turn, these concerns are playing a growing role in domestic politics. environmental issues are playing a growing role in disputes about international trade as well. Some anti-globalization activists claim that growing international trade automatically harms the environment; some also claim that international trade agreements—and the role of the World Trade Organization in particular—have the effect of blocking environmental action.

Most international economists view the first claim as simplistic and disagree with the second. That is, they deny that there is a simple relationship between globalization and environmental damage and do not believe that trade agreements prevent countries from having enlightened environmental policies. Nonetheless, the intersection of trade and the environment does raise a number of important issues.

9.1 The Environmental Kuznets Curve (EKC)

- Empirical evidence suggests that as economies grow, they initially do increasing environmental damage—but they become more environmentally friendly once they become sufficiently rich. China, where the environment is deteriorating as the economy expands, is in effect moving from A to B. Richer countries may be moving from C to D, using some of their growth to improve the environment.
- In the early 1990s, Princeton economists Gene Grossman and Alan Krueger, studying the relationship between national income levels and pollutants such as sulfur dioxide, found that these offsetting effects of economic growth lead to a distinctive “inverted U” relationship between per-capita income and environmental damage known as the environmental Kuznets curve. This concept, whose relevance has been confirmed by a great deal of further research, is illustrated schematically in Figure 9a.
- The idea is that as a country’s income per-capita rises due to economic growth, the initial effect is growing damage to the environment. Thus, China, whose economy has surged in recent decades, is in effect moving from point A to point B: As the country burns more coal in its power plants and produces more goods in its factories, it emits more sulfur dioxide into the air and dumps more effluent into its rivers.

Environmental damage

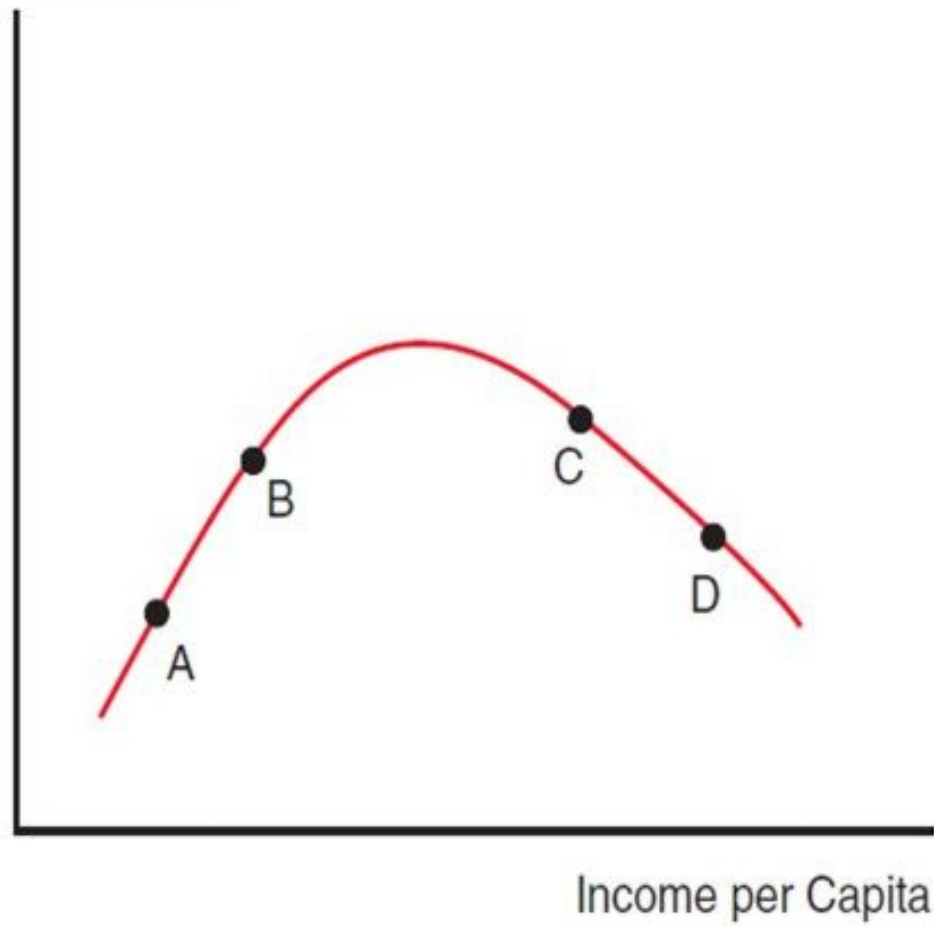


Figure 9.1: Figure 9a: Environmental Kuznet Curve

- But when a country gets sufficiently rich, it can afford to take action to protect the environment. As the United States has grown richer in recent decades, it has also moved to limit pollution. For example, cars are required to have catalytic converters that reduce smog, and a government-licensing scheme limits emissions of sulfur dioxide from power plants. In terms of Figure 9a, the United States has on some fronts, such as local air pollution, moved from C to D: growing richer and doing less damage to the environment. Figure 9b shows different stages of EKC.

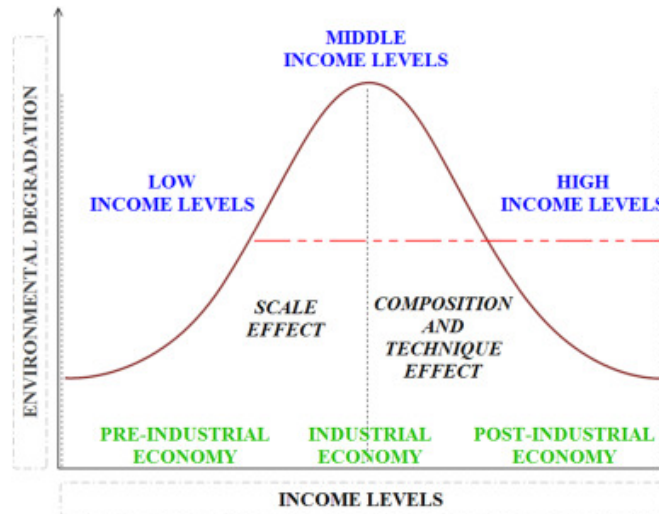


Figure 9.2: Figure 9b: Different stages in EKC

9.2 What does Kuznet Curve have to do with international trade?

- Trade liberalization is often advocated on the grounds that it will promote economic growth. To the extent that it succeeds in accomplishing this end, it will raise per-capita income. Will this improve or worsen environmental quality? It depends which side of the environmental Kuznets curve an economy is on. In their original paper, which was in part a response to critics of the North American Free Trade Agreement who argued that the agreement would be environmentally harmful, Grossman and Krueger suggested that Mexico might be on the right side of the curve—that is, to the extent that NAFTA raises Mexican income, it might actually lead to a reduction in environmental damage.
- However, the environmental Kuznets curve does not, by any means, necessarily imply that globalization is good for the environment. In fact, it's fairly easy to make the argument that at a world level, globalization has indeed harmed the environment—at least so far.

- This argument would run as follows: The biggest single beneficiary of globalization has arguably been China, whose export-led economy has experienced incredible growth since 1980. Meanwhile, the single biggest environmental issue is surely climate change: There is broad scientific consensus that emissions of carbon dioxide and other greenhouse gases are leading to a rise in the Earth's average temperature.
- China's boom has been associated with a huge increase in its emissions of carbon dioxide. Figure 9c shows carbon dioxide emissions of the United States, Europe, and China from 1980 to 2011. In 1980, China was a minor factor in global warming; by 2008, it was, by a substantial margin, the world's leading emitter of greenhouse gases. It's important to realize, though, that the problem here isn't globalization per se—it's China's economic success, which has to some extent come as a result of globalization. And despite environmental concerns, it's difficult to argue that China's growth, which has raised hundreds of millions of people out of dire poverty, is a bad thing.

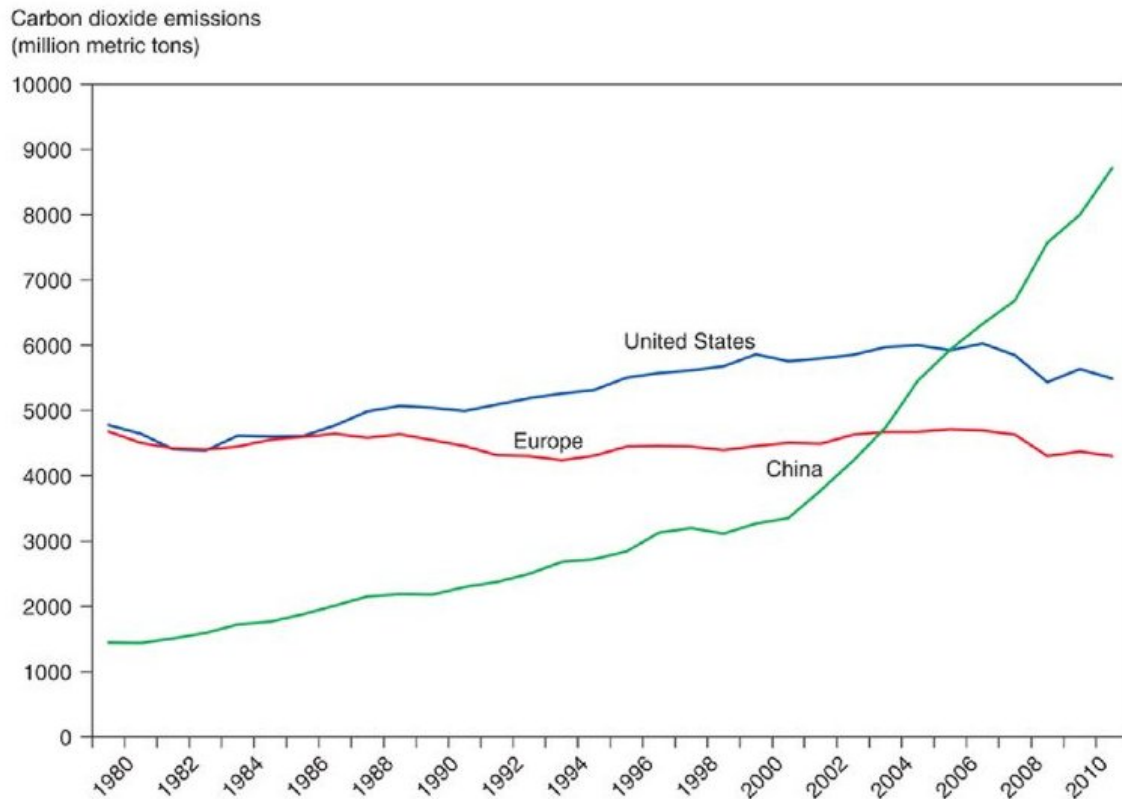


Figure 9.3: Figure 9c: Carbon Dioxide Emissions (The rapid economic growth of China has turned it from a minor factor in climate change to the world's largest emitter of carbon dioxide.)

9.3 The Problem of “Pollution Havens”

When ships get too old to continue operating, they are disassembled to recover their scrap metal and other materials. One way to look at “shipbreaking” is that it is a form of recycling: Instead of leaving a ship to rust, a shipbreaking firm extracts and reuses its components. Ultimately, this salvaging means that less iron ore needs to be mined, less oil extracted, and so on. One might expect shipbreaking to be good for the environment. The task itself, however, can be environmentally hazardous: Everything from the residual oil in a ship’s tanks to the plastic in its chairs and interior fittings, if not handled carefully, can be toxic to the local environment.

Pollution is the classic example of a negative externality—a cost that individuals impose on others but don’t pay for. That’s why pollution is a valid reason for government intervention. However, different forms of pollution have very different geographical reach—and only those that extend across national boundaries obviously justify international concern.

Thus, to the extent that Indian shipbreaking pollutes the local environment, this is a problem for India; it’s less clear that it is a problem for other countries. Similarly, air pollution in Mexico City is a problem for Mexico; it’s not clear why it’s a valid U.S. interest. On the other hand, emissions of carbon dioxide affect the future climate for all countries: They’re an international externality and deserve to be the subject of international negotiation.

9.4 The Carbon Tariff Dispute

In 2009, the U.S. House of Representatives passed a bill that would have created a cap-and-trade system for greenhouse gases—that is, a system under which a limited number of emissions licenses are issued and firms are required to buy enough licenses to cover their actual emissions, in effect putting a price on carbon dioxide and other gases. The Senate failed to pass any comparable bill, so climate-change legislation is on hold for the time being. Nonetheless, there was a key trade provision in the House bill that may represent the shape of things to come: It imposed carbon tariffs on imports from countries that fail to enact similar policies.

The idea behind carbon tariffs is to charge importers of goods from countries without climate-change policies an amount proportional to the carbon dioxide emitted in the production of those goods. The charge per ton of emissions would be equal to the price of carbon dioxide emission licenses in the domestic market. This would give overseas producers an incentive to limit their carbon emissions and would remove the incentive to shift production to countries with lax regulation. In addition, it would, possibly, give countries with lax regulations an incentive to adopt climate-change policies of their own.

At this point, the issue of carbon tariffs is hypothetical, since no major economy has yet placed a significant price on greenhouse gas emissions. Correspondingly, the WTO hasn’t issued any rulings on the legality of such tariffs, and probably won’t until or unless a real case emerges.

But if climate-change legislation makes a comeback—and it is a good bet that it will sooner or later—it will clearly lead to some major new issues in trade policy.

»> **Assignment 3**

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10 National Income Accounting and the Balance of Payments

We shift our focus and ask: How can economic policy ensure that factors of production are fully employed? And what determines how an economy's capacity to produce goods and services changes over time? To answer these questions, we must understand macroeconomics, the branch of economics that studies how economies' overall levels of employment, production, and growth are determined.

Macroeconomic analysis emphasizes four aspects of economic life that, until now, we have usually kept in the background to simplify our discussion of international economics:

1. Unemployment: We know that in the real world, workers may be unemployed and factories may be idle. Macroeconomics studies the factors that cause unemployment and the steps governments can take to prevent it.
2. Saving: In earlier chapters, we usually assumed that every country consumes an amount exactly equal to its income—no more and no less. In reality, though, households can put aside part of their income to provide for the future, or they can borrow temporarily to spend more than they earn.
3. Trade imbalances: As we saw in earlier chapters, the value of a country's imports equals the value of its exports when spending equals income. This state of balanced trade is seldom attained by actual economies.
4. Money and the price level: The trade theory you have studied so far is a barter theory, one in which goods are exchanged directly for other goods on the basis of their relative prices. In practice, it is more convenient to use money—a widely acceptable medium of exchange—in transactions, and to quote prices in terms of money. Because money changes hands in virtually every transaction that takes place in a modern economy, fluctuations in the supply of money or in the demand for it can affect both output and employment.

10.1 The National Income Accounts

10.1.1 Gross National Product (GNP)

A country's gross national product (GNP), the value of all final goods and services produced by the country's factors of production and sold on the market in a given time period. To distinguish among the different types of expenditure that make up a country's GNP, government economists and statisticians who compile national income accounts divide GNP among the four possible uses for which a country's final output is purchased:

- (i) Consumption (the amount consumed by private domestic residents)
- (ii) Investment (the amount put aside by private firms to build new plant and equipment for future production),
- (iii) Government purchases (the amount used by the government), and
- (iv) Current account balance (the amount of net exports of goods and services to foreigners).

Figure 10a shows how U.S. GNP was divided among its four components in the first quarter of 2016:

Why is it useful to divide GNP into consumption, investment, government purchases, and the current account?

- One major reason is that we cannot hope to understand the cause of a particular recession or boom without knowing how the main categories of spending have changed. And without such an understanding, we cannot recommend a sound policy response.
- In addition, the national income accounts provide information essential for studying why some countries are rich—that is, have a high level of GNP relative to population size—while some are poor.

10.1.2 Gross Domestic Product (GDP)

A country's gross domestic product (GDP) is supposed to measure the volume of production within a country's borders, whereas GNP equals GDP plus net receipts of factor income from the rest of the world.

Most countries other than the United States have long reported GDP rather than GNP as their primary measure of national economic activity. In 1991, the United States began to follow this practice as well. As a practical matter, movements in GDP and GNP usually do not differ greatly.

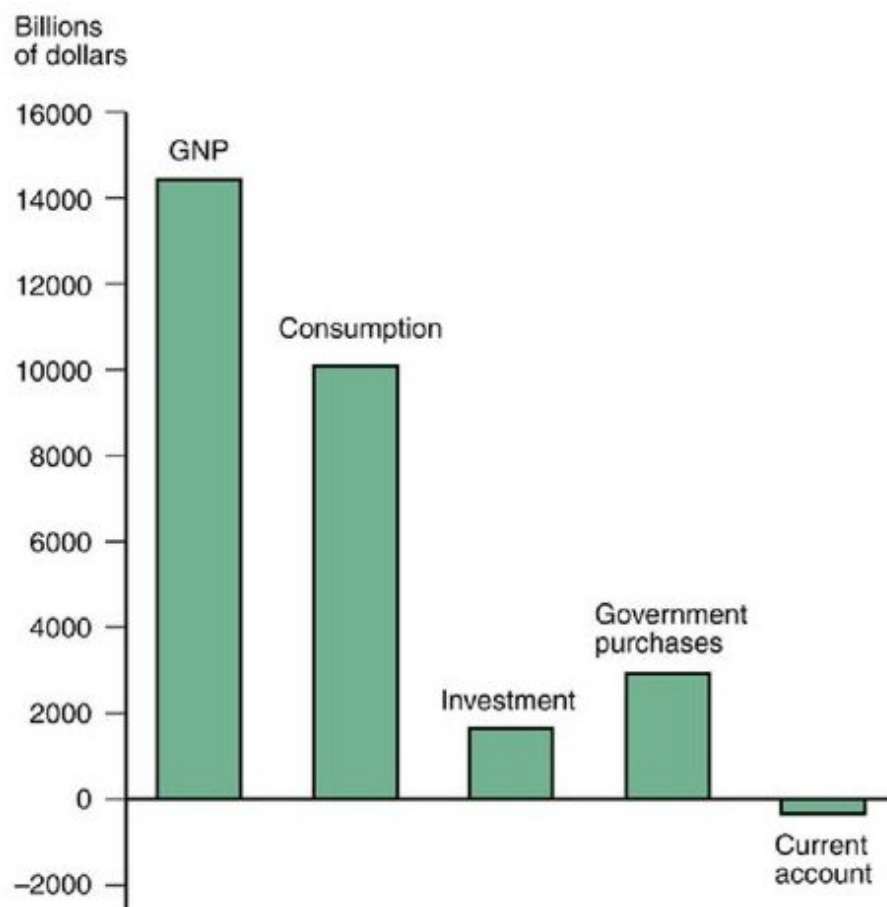


Figure 10.1: Figure 10a: U.S. GNP and Its Components

10.1.3 National Income Accounting for an Open Economy

We will see that in open economies, saving and investment are not necessarily equal, as they are in a closed economy.

- **Consumption (C)**

The portion of GNP purchased by private households to fulfill current wants is called consumption. Purchases of movie tickets, food, dental work, and washing machines all fall into this category. Consumption expenditure is the largest component of GNP in most economies.

Example: In the United States, for example, the fraction of GNP devoted to consumption has fluctuated in a range from about 62 to 70 percent over the past 60 years.

- **Investment (I)**

The part of output used by private firms to produce future output is called investment. Investment spending may be viewed as the portion of GNP used to increase the nation's stock of capital. Investment is usually more variable than consumption.

Example: In the United States, (gross) investment has fluctuated between 11 and 22 percent of GNP in recent years.

- **Government Purchases (G)**

Any goods and services purchased by federal, state, or local governments are classified as government purchases in the national income accounts. Included in government purchases are federal military spending, government support of cancer research, and government funds spent on highway repair and education. Government purchases include investment as well as consumption purchases.

Example: Government purchases currently take up about 17 percent of U.S. GNP, and this share has fallen somewhat since the late 1950s. (The corresponding figure for 1959, for example, was around 22 percent.)

10.1.4 The National Income Identity for an Open Economy

- In a closed economy, any final good or service not purchased by households or the government must be used by firms to produce new plant, equipment, and inventories.
- This information leads to a fundamental identity for closed economies. Let Y stand for GNP, C for consumption, I for investment, and G for government purchases. Since all of a closed economy's output must be consumed, invested, or bought by the government, we can write

$$Y = C + I + G$$

- Residents of an open economy may spend some of their income on imports, that is, goods and services purchased from abroad, only the portion of their spending not devoted to imports is part of domestic GNP. The value of imports, denoted by IM , must be subtracted from total domestic spending.
- The goods and services sold to foreigners make up a country's exports. Exports, denoted by EX , are the amount foreign residents' purchases add to the national income of the domestic economy.
- The national income of an open economy is the sum of domestic and foreign expenditures on the goods and services produced by domestic factors of production. Thus, the national income identity for an open economy is

$$Y = C + I + G + EX - IM$$

11 National Income Accounting and the Balance of Payments: Part B

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12 Money, Interest Rates, and Exchange Rates

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»> **Assignment 4**

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13 International Monetary Systems

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14 Financial Globalization

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15 Developing Countries Growth, Crisis, and Reform

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»> **Assignment 5**

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