



UNIT 1

THE CAPITALIST REVOLUTION

HOW CAPITALISM REVOLUTIONIZED THE WAY WE LIVE, AND HOW ECONOMICS ATTEMPTS TO UNDERSTAND THIS AND OTHER ECONOMIC SYSTEMS

- Since the 1700s, increases in average living standards became a permanent feature of economic life in many countries.
- This was associated with the emergence of a new economic system called capitalism, in which private property, markets and firms play a major role.
- Under this new way of organizing the economy, advances in technology and specialization in products and tasks raised the amount that could be produced in a day's work.
- This process, which we call the capitalist revolution, has been accompanied by growing threats to our natural environment, and by unprecedented global economic inequalities.
- Economics is the study of how people interact with each other, and with the natural environment, in producing their livelihoods.

In the fourteenth century, the Moroccan scholar Ibn Battuta described Bengal in India as 'A country of great extent, and one in which rice is extremely abundant. Indeed, I have seen no region of the earth in which provisions are so plentiful.'

And he had seen much of the world, having travelled to China, west Africa, the Middle East and Europe. Three centuries later, the same sentiment was expressed by the seventeenth century French diamond merchant Jean Baptiste Tavernier who wrote of the country:

Even in the smallest villages, rice, flour, butter, milk, beans and other vegetables, sugar and sweetmeats, dry and liquid, can be procured in abundance.

THEMES AND CAPSTONE UNITS

- 17: History, instability, and growth
- 18: Global economy
- 19: Inequality
- 20: Environment
- 21: Innovation
- 22: Politics and policy

Jean Baptiste Tavernier, *Travels in India* (1676).

At the time of Ibn Battuta's travels, India was not richer than the other parts of the world. But India was not much poorer, either. An observer at the time would have noticed that people, on average, were better off in Italy, China and England than in Japan or India. But the vast differences between the rich and the poor, which the traveller would have noted wherever he went, were much more striking than these differences across regions. Rich and poor would often have different titles: in some places they would be feudal lords and serfs, in others royalty and their subjects, slave owners and slaves, or merchants and the sailors who transported their goods. Then—as now—your prospects depended on where your parents were on the economic ladder and whether you were male or female. The difference in the fourteenth century, compared with today, was that back then the part of the world in which you were born mattered much less.

Fast forward to today. The people of India are far better off than they were seven centuries ago if we think about their access to food, medical care, shelter and the necessities of life, but by world standards today most are poor.

Ibn Battuta (1304–1368) was a Moroccan traveller and merchant. His travels, which lasted 30 years, took him across north and west Africa, eastern Europe, the Middle East, south and central Asia and China.

Figure 1.1a tells some of the story. To compare living standards in each country, we use a measure called GDP per capita. People obtain their incomes by producing and selling goods and services. GDP (gross domestic product) is the total value of everything produced in a given period such as a year, so GDP per capita corresponds here to average annual income. GDP is also referred to as gross domestic income. In Figure 1.1a the height of each line is an estimate of average income at the date on the horizontal axis.

On average, people are six times better off in Britain than in India by this measure. Japanese people are as rich as the British, just as they were in the fourteenth century, but now Americans are even better off than the Japanese, and Norwegians are better off still.

Jutta Bolt and Jan Juiten van Zanden. 2013. 'The First Update of the Maddison Project Re-Estimating Growth Before 1820'. Maddison-Project Working Paper WP-4 (January). Stephen Broadberry. 2013. Accounting for the great divergence. 1 November. Conference Board, The. 2015. Total Economy Database.

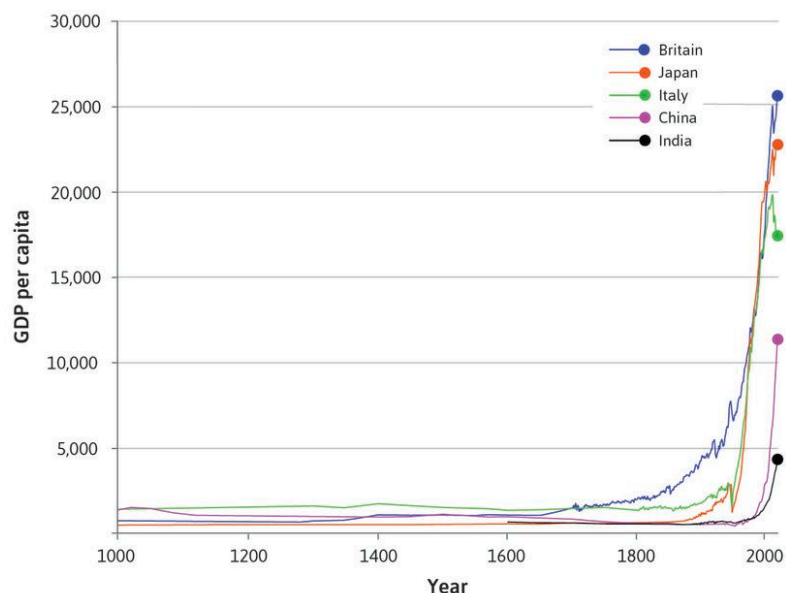


Figure 1.1a History's hockey stick: Gross domestic product per capita in five countries (1000–2015).

We can draw the graph in Figure 1.1a because of the work of Angus Maddison who dedicated his working life to finding the scarce data needed to make useful comparisons of how people lived across more than 1,000 years (his work is continuing in the Maddison Project). In this course you will see that data like this about regions of the world, and the people in it, is the starting point of all economics. In our video, the economists James Heckman and Thomas Piketty explain how collecting data has been fundamental to their work on inequality and the policies to reduce it.



1.1 INCOME INEQUALITY

A thousand years ago the world was flat, economically speaking. There were differences in income between the regions of the world; but as you can see from Figure 1.1a, the differences were small compared to what was to follow.

Nobody thinks the world is flat today, when it comes to income.

Figure 1.2 shows the distribution of income across and within countries. Countries are arranged according to GDP per capita from the poorest on the left of the diagram (Liberia), to the richest on the right (Singapore). The width of each country's bars represents its population.

For every country there are ten bars, corresponding to the ten deciles of income. The height of each bar is the average income of 10% of the population, ranging from the poorest 10% of people at the front of the diagram to the richest 10% at the back, measured in 2005 US dollars. Note that this doesn't mean 'the richest 10% of income earners'. It is the richest 10% of people, where each person in a household, including children, is assumed to have an equal share of the household's income.

The skyscrapers (the highest columns) at the back of the right-hand side of the figure represent the income of the richest 10% in the richest countries. The tallest skyscraper is the richest 10% of people in Singapore. In 2014, this exclusive group had an income per capita of more than \$67,000. Norway, the country with the second highest GDP per capita, does not have a particularly tall skyscraper (it is hidden between the skyscrapers for Singapore and the third richest country, the US) because income is more evenly distributed in Norway than in some other rich countries.

The analysis in Figure 1.2 shows how the distribution of income has changed since 1980.

Two things are clear from the 2014 distribution. First, in every country, the rich have much more than the poor. A handy measure of inequality in a country is called the 90/10 ratio, which we define here as the average income of the richest 10% divided by the average income of the poorest 10%. It is more commonly defined as the income of the 90th percentile divided by that of the 10th percentile. Even in a relatively equal country such as Norway, the 90/10 ratio is 5.4; in the US it is 16 and in Botswana in southern Africa it is 145. Inequality within the very poorest countries is difficult to see in the graph, but it is definitely there: the 90/10 ratio is 22 in Nigeria, and 20 in India.

The second thing that jumps out from Figure 1.2 is the huge difference in income between countries. Average income in Norway is 19 times the average income in Nigeria. And the poorest 10% in Norway receive almost twice the income of the richest 10% in Nigeria.

Imagine the traveller Ibn Battuta's journey across regions of the world in the fourteenth century and think of how this would have looked in a



Thomas Piketty and James Heckman explain why data is fundamental to their work
<http://tinyco.re/6056324>

GCIP 2015. Global Consumption and Income Project. Bob Sutcliffe designed the representation of global inequality in Figure 1.2. A first version was published in: Robert, B Sutcliffe. 2001. *100 Ways of Seeing an Unequal World*. London: Zed Books. See the interactive version of this graph on the Globalinc website (<http://tinyco.re/7434364>).

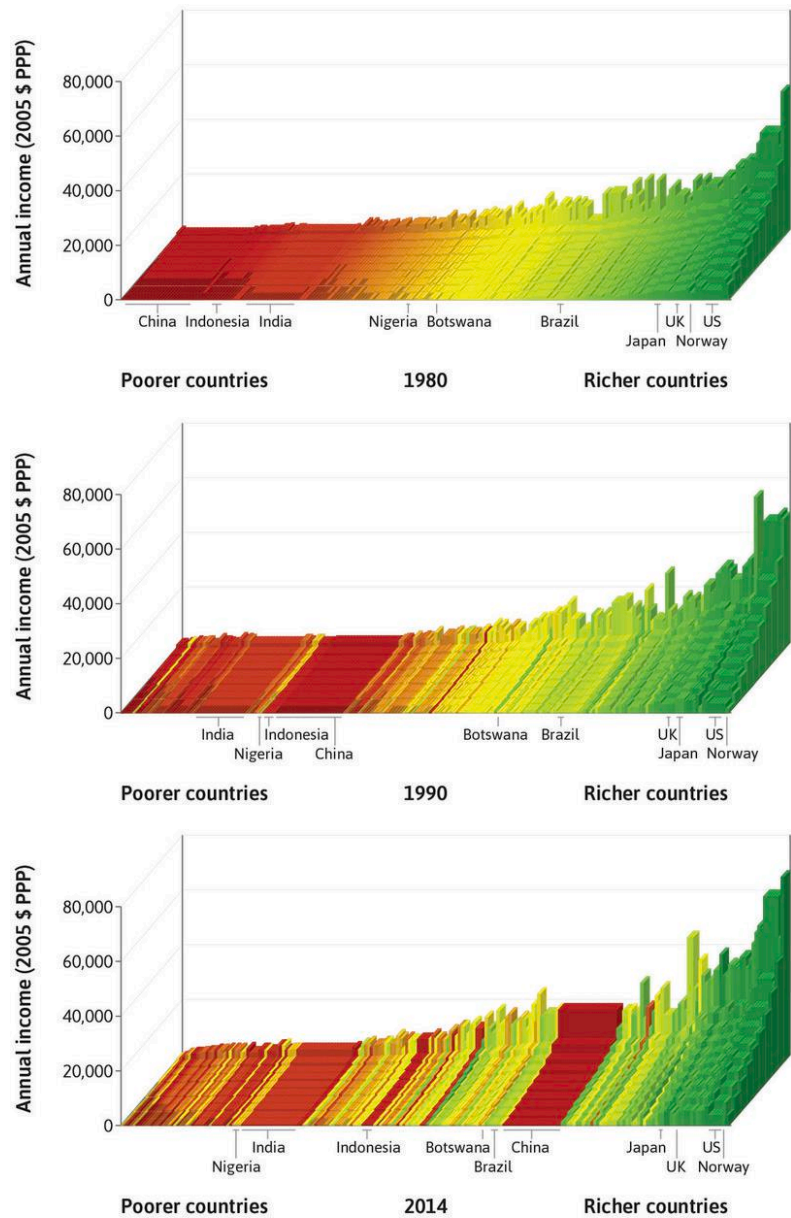


Figure 1.2 Countries are ranked by GDP per capita from left to right. For each country the heights of the bars show average income for deciles of the population, from the poorest 10% at the front to the richest 10% at the back. The width of the bar indicates the country's population.

diagram like Figure 1.2. He would of course notice that everywhere he went there were differences between the richest and poorest groups in the population of each region. He would report back that the differences in income between the countries of the world were relatively minor by comparison.

The vast differences in income between the countries of the world today take us back to Figure 1.1a, where we can begin to understand how this came about. The countries that took off economically before 1900—UK, Japan, Italy—are now rich. They (and countries like them) are in the skyscraper part of Figure 1.2. The countries that took off only recently, or not at all, are in the flatlands.

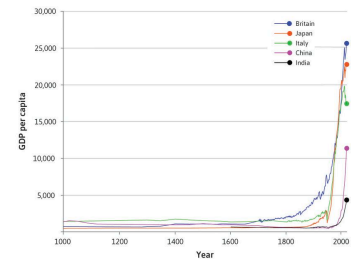
EXERCISE 1.1 INEQUALITY IN THE FOURTEENTH CENTURY

What do you think a ‘skyscraper’ figure like Figure 1.2 (page 4) would have looked like at the time of Ibn Battuta (early to mid-fourteenth century)?

EXERCISE 1.2 WORKING WITH INCOME DATA

You can see the interactive graph (<http://tinyco.re/7434364>) and download the spreadsheet data (<http://tinyco.re/7444763>) that we used to create Figure 1.2. Choose five countries that you are interested in.

1. For each one calculate the 90/10 ratio in 1980, 1990 and 2014.
2. Describe the differences between countries and the changes over time that you find.
3. Can you think of any explanations for them?



Countries that took off economically before 1900 (Figure 1.1a) are in the ‘skyscraper’ part of Figure 1.2.

1. The richest and poorest

In Singapore, the richest country on the furthest right, the average incomes of the richest and poorest 10% are \$67,436 and \$3,652 respectively. In Liberia, the furthest left, the corresponding incomes are \$994 and \$17.

2. Skyscrapers

The skyscraper bars in the back right of the figure are the richest 10% in some of the richest countries.

3. World income distribution in 1980

In 1980 the ranking of countries by GDP was different. The poorest countries, coloured darkest red, were Lesotho and China. The richest (darkest green) were Switzerland, Finland and then the US. At that time the skyscrapers were not as tall: the differences between the richest 10% and the rest of a country's population were not as pronounced.

4. World income distribution in 1990

You can see from the colours that some countries changed their ranking between 1980 and 1990. China (dark red) is now richer; Uganda, also red, is in the middle of the distribution amongst countries coloured yellow. Some taller skyscrapers have appeared: inequality increased in many countries during the 1980s.

5. World income distribution in 2014

By 2014, many countries have changed their ranking. China has grown rapidly since 1990. But the countries that were richest in 1980 (darkest green) are still near the top in 2014.

6. Inequality within countries has risen

Income distributions have become more unequal in many of the richer countries: some very tall skyscrapers have appeared. In the middle-income countries, too, there is a big step up at the back of the figure: the incomes of the richest 10% are now high relative to the rest of the population.

gross domestic product (GDP) A measure of the market value of the output of the economy in a given period.

Diane Coyle. 2014. *GDP: A Brief but Affectionate History*. Princeton, NJ: Princeton University Press.

Listen to Diane Coyle talking about the benefits and limitations of measuring GDP (<http://tinyco.re/1216717>).

disposable income Income available after paying taxes and receiving transfers from the government.

Jennifer Robison. 2011. 'Happiness Is Love – and \$75,000' (<http://tinyco.re/6313076>). *Gallup Business Journal*. Updated 17 November 2011.

1.2 MEASURING INCOME AND LIVING STANDARDS

The estimate of living standards that we used in Figure 1.1a (GDP per capita) is a measure of the total goods and services produced in a country (called **gross domestic product**, or **GDP**), which is then divided by the country's population.

GDP measures the output of the economy in a given period, such as a year. Diane Coyle, an economist, says it 'adds up everything from nails to toothbrushes, tractors, shoes, haircuts, management consultancy, street cleaning, yoga teaching, plates, bandages, books, and the millions of other services and products in the economy'.

Adding up these millions of services and products requires finding some measure of how much a yoga class is worth compared to a toothbrush. Economists must first decide what should be included, but also how to give a value to each of these things. In practice, the easiest way to do this is by using their prices. When we do this, the value of GDP corresponds to the total income of everyone in the country.

Dividing by the population gives GDP per capita—the average income of people in a country. But is that the right way to measure their living standards, or wellbeing?

Disposable income

GDP per capita measures average income, but that is not the same as the **disposable income** of a typical person.

Disposable income is the amount of wages or salaries, profit, rent, interest and transfer payments from the government (such as unemployment or disability benefits) or from others (for example, gifts) received over a given period such as a year, minus any transfers the individual made to others (including taxes paid to the government). Disposable income is thought to be a good measure of living standards because it is the maximum amount of food, housing, clothing and other goods and services that the person can buy without having to borrow—that is, without going into debt or selling possessions.

Is our disposable income a good measure of our wellbeing?

Income is a major influence on wellbeing because it allows us to buy the goods and services that we need or enjoy. But it is insufficient, because many aspects of our wellbeing are not related to what we can buy.

For example, disposable income leaves out:

- The quality of our social and physical environment such as friendships and clean air.
- The amount of free time we have to relax or spend time with friends and family.
- Goods and services that we do not buy, such as healthcare and education, if they are provided by a government.
- Goods and services that are produced within the household, such as meals or childcare (predominantly provided by women).

Average disposable income and average wellbeing

When we're part of a group of people (a nation for example, or an ethnic group) is the average disposable income a good measure of how well off the group is? Consider a group in which each person initially has a disposable income of \$5,000 a month, and imagine that, with no change in prices,

income has risen for every individual in the group. Then we would say that average or typical wellbeing had risen.

But now think about a different comparison. In a second group, the monthly disposable income of half the people is \$10,000. The other half has just \$500 to spend every month. The average income in the second group (\$5,250) is higher than in the first (which was \$5,000 before incomes rose). But would we say that the second group's wellbeing is greater than that of the first group, in which everyone has \$5,000 a month? The additional income in the second group is unlikely to matter much to the rich people, but the poor half would think their poverty was a serious deprivation.

Absolute income matters for wellbeing, but we also know from research that people care about their relative position in the income distribution. They report lower wellbeing if they find they earn less than others in their group.

Since income distribution affects wellbeing, and because the same average income may result from very different distributions of income between rich and poor within a group, average income may fail to reflect how well off a group of people is by comparison to some other group.

Valuing government goods and services

GDP includes the goods and services produced by the government, such as schooling, national defence, and law enforcement. They contribute to wellbeing but are not included in disposable income. In this respect, GDP per capita is a better measure of living standards than disposable income.

But government services are difficult to value, even more so than services such as haircuts and yoga lessons. For goods and services that people buy we take their price as a rough measure of their value (if you valued the haircut less than its price, you would have just let your hair grow). But the goods and services produced by government are typically not sold, and the only measure of their value to us is how much it cost to produce them.

The gaps between what we mean by wellbeing, and what GDP per capita measures, should make us cautious about the literal use of GDP per capita to measure how well off people are.

But when the changes over time or differences among countries in this indicator are as great as those in Figure 1.1a (and in Figures 1.1b, 1.8 and 1.9 later in this unit), GDP per capita is undoubtedly telling us something about the differences in the availability of goods and services.

In the Einstein at the end of this section, we look in more detail at how GDP is calculated so that we can compare it through time and make comparisons between countries. (Many of the units have Einsteins. You don't have to use them, but they will show you how to calculate and understand many of the statistics that we employ.) Using these methods, we can use GDP per capita to unambiguously communicate ideas such as 'people in Japan are on average a lot richer than they were 200 years ago, and a lot richer than the people of India today.'

'Quality of Life Indicators—
Measuring Quality of Life'
(<http://tinyco.re/8771109>).
Eurostat. Updated 5 November
2015.

EXERCISE 1.3 WHAT SHOULD WE MEASURE?

While campaigning for the US presidency on 18 March 1968, Senator Robert Kennedy gave a famous speech questioning ‘the mere accumulation of material things’ in American society, and why, among other things, air pollution, cigarette advertising and jails were counted when the US measured its living standards, but health, education or devotion to your country were not. He argued that ‘it measures everything, in short, except that which makes life worthwhile.’

Read his speech in full (<http://tinyco.re/9533853>) or listen to a sound recording (<http://tinyco.re/6486668>) of it.

1. In the full text, which goods does he list as being included in a measure of GDP?
2. Do you think these should be included in such a measure, and why?
3. Which goods does he list in the full text as missing from the measure?
4. Do you think they should be included, and why?

QUESTION 1.1 CHOOSE THE CORRECT ANSWER(S)

What does UK GDP per capita measure?

- ☐ the total output of London’s economy
- ☐ the average disposable income of a UK resident
- ☐ the total output of the UK residents, divided by the number of the residents
- ☐ the total output of the UK’s economy, divided by the country’s population

EINSTEIN*Comparing income at different times, and across different countries*

The United Nations collects and publishes estimates of GDP from statistical agencies around the world. These estimates, along with those made by economic historians, allow us to construct charts like Figure 1.1a, comparing living standards across countries and at different time periods, and looking at whether the gap between rich and poor countries has narrowed or widened over time. Before we can make a statement like: ‘On average, people in Italy are richer than people in China, but the gap between them is narrowing,’ statisticians and economists must try to solve three problems:

- We need to separate the thing we want to measure—changes or differences in amounts of goods and services—from things that are not relevant to the comparison, especially changes or differences in the prices of the goods and services.
- When comparing output in one country at two points in time, it is necessary to take into account differences in prices between the two points in time.

- When comparing output between two countries at a point in time, it is necessary to take into account differences in prices between the two countries.

Notice how similar the last two statements are. Measuring changes in output at different points in time presents the same challenges as we face when we try to compare countries by measuring differences in their output at the same time. The challenge is to find a set of prices to use in this calculation that will allow us to identify changes or differences in outputs, without making the mistake of assuming that if the price of something rises in a country, but not in another, then the amount of output has increased in the country.

The starting point: Nominal GDP

When estimating the market value of output in the economy as a whole for a given period, such as a year, statisticians use the prices at which goods and services are sold in the market. By multiplying the quantities of the vast array of different goods and services by their prices, they can be converted into money, or nominal, terms. With everything in the common unit of nominal (or money) terms, they can be added together. Nominal GDP is written like this:

$$\begin{aligned} &(\text{price of a yoga lesson}) \times (\text{number of yoga lessons}) \\ &+ (\text{price of a book}) \times (\text{number of books}) + \dots \\ &+ (\text{price}) \times (\text{quantity}) \text{ for all other goods and services} \end{aligned}$$

In general, we write that:

$$\text{nominal GDP} = \sum_i p_i q_i$$

Where p_i is the price of good i , q_i is the quantity of good i , and Σ indicates the sum of price times quantity for all the goods and services that we count.

Taking account of price changes over time: Real GDP

To gauge whether the economy is growing or shrinking, we need a measure of the quantity of goods and services purchased. This is called real GDP. If we compare the economy in two different years, and if all the quantities stay the same but the prices increase by, say, 2% from one year to the next, then nominal GDP rises by 2%, but real GDP is unchanged. The economy has not grown.

Because we cannot add together the number of computers, shoes, restaurant meals, flights, fork-lift trucks, and so on, it is not possible to measure real GDP directly. Instead, to get an estimate of real GDP, we have to begin with nominal GDP as defined above.

On the right-hand side of the equation for nominal GDP are the prices of each item of final sales multiplied by the quantity.

To track what is happening to real GDP, we begin by selecting a base year: for example, the year 2010. We then define real GDP using 2010 prices as equal to nominal GDP that year. The following year, nominal GDP for 2011 is calculated as usual using the prices prevailing in 2011.

constant prices Prices corrected for increases in prices (inflation) or decreases in prices (deflation) so that a unit of currency represents the same buying power in different periods of time. *See also: purchasing power parity.*

If you want the up-to-date statistic a website called Numbeo (<http://tinyco.re/6386280>) shows cost-of-living comparisons.

purchasing power parity (PPP) A statistical correction allowing comparisons of the amount of goods people can buy in different countries that have different currencies. *See also: constant prices.*

Next, we can see what has happened to real GDP by multiplying the 2011 quantities by the 2010 prices. If, using the base year prices, GDP has gone up, we can infer that real GDP has increased.

If this method produces the result that, when computed using 2010 prices, GDP in 2011 is the same as in 2010, we can infer that although there might have been a change in the composition of output (fewer flights taken but more computers sold, for example), the overall quantity of output of goods and services has not changed. The conclusion would be that real GDP, which is also called GDP at **constant prices**, is unchanged. The growth rate of the economy in real terms is zero.

Taking account of price differences among countries: International prices and purchasing power

To compare countries, we need to choose a set of prices and apply it to both countries.

To begin with, imagine a simple economy which produces only one product. As an example, we choose a regular cappuccino because we can easily find out the price of this standard product in different parts of the world. And we choose two economies that are very different in their level of development: Sweden and Indonesia.

At the time we wrote this, when prices are converted into US dollars using current exchange rates, a regular cappuccino costs \$3.90 in Stockholm and \$2.63 in Jakarta.

But simply expressing the two cappuccinos in a common currency is not enough, because the international current exchange rate that we used to get these numbers is not a very good measure of how much a rupiah will buy in Jakarta and how much a krona will get you in Stockholm.

This is why when comparing living standards across countries, we use estimates of GDP per capita in a common set of prices known as **purchasing power parity (PPP)** prices. As the name suggests, the idea is to achieve parity (equality) in the real purchasing power.

Prices are typically higher in richer countries—as in our example. One reason for this is that wages are higher, which translates into higher prices. Because prices of cappuccinos, restaurant meals, haircuts, most types of food, transport, rents and most other goods and services are more expensive in Sweden than in Indonesia, once a common set of prices is applied, the difference between GDP per capita in Sweden and Indonesia measured at PPP is smaller than it is if the comparison is made at current exchange rates.

At current exchange rates, GDP per capita in Indonesia is only 6% of the level of Sweden; at PPP where the comparison uses international prices, GDP per capita in Indonesia is 21% of the level of Sweden.

What this comparison shows is that the buying power of the Indonesian rupiah compared to the Swedish krona is more than three times greater than would be indicated by the current exchange rate between the two currencies.

We will examine the measurement of GDP (and other measures of the whole economy) in more detail in Unit 13.



1.3 HISTORY'S HOCKEY STICK: GROWTH IN INCOME

A different way of looking at the data in Figure 1.1a is to use a scale that shows GDP per capita doubling as we move up the vertical axis (from \$250 per capita per year to \$500, then to \$1,000, and so on). This is called a ratio scale and is shown in Figure 1.1b. The ratio scale is used for comparing growth rates.

By the growth rate of income or of any other quantity, for example population, we mean the rate of change:

$$\text{growth rate} = \frac{\text{change in income}}{\text{original level of income}}$$

If the level of GDP per capita in the year 2000 is \$21,046, as it was in Britain in the data shown in Figure 1.1a, and \$21,567 in 2001, then we can calculate the growth rate:

$$\begin{aligned} \text{growth rate} &= \frac{\text{change in income}}{\text{original level of income}} \\ &= \frac{y_{2001} - y_{2000}}{y_{2000}} \\ &= \frac{21,567 - 21,046}{21,046} \\ &= 0.025 \\ &= 2.5\% \end{aligned}$$

Whether we want to compare levels or growth rates depends on the question we are asking. Figure 1.1a makes it easy to compare the levels of GDP per capita across countries, and at different times in history. Figure 1.1b uses a ratio scale, which makes it possible to compare growth rates across countries and at different periods. When a ratio scale is used, a series that grows at a constant rate looks like a straight line. This is because the percentage (or proportional growth rate) is constant. A steeper line in the ratio scale chart means a faster growth rate.

To see this, think of a growth rate of 100%: that means the level doubles. In Figure 1.1b, with the ratio scale, you can check that if GDP per capita doubled over 100 years from a level of \$500 to \$1,000, the line would have the same slope as a doubling from \$2,000 to \$4,000 dollars, or from \$16,000 to \$32,000 over 100 years. If, instead of doubling, the level quadrupled (from say, \$500 to \$2,000 over 100 years), the line would be twice as steep, reflecting a growth rate that was twice as high.

In some economies, substantial improvements in people's living standards did not occur until they gained independence from colonial rule or interference by European nations:

- *India*: According to Angus Deaton, an economist who specializes in the analysis of poverty, when 300 years of British rule of India ended in 1947: 'It is possible that the deprivation in childhood of Indians ... was as severe as that of any large group in history'. In the closing years of British rule, a child born in India could expect to live for 27 years. Fifty years on, life expectancy at birth in India had risen to 65 years.
- *China*: It had once been richer than Britain, but by the middle of the twentieth century GDP per capita in China was one-fifteenth that of Britain.



If you have never seen an ice-hockey stick (or experienced ice hockey) this shape is why we call these figures 'hockey-stick curves'.

- *Latin America*: Neither Spanish colonial rule, nor its aftermath following the independence of most Latin American nations early in the nineteenth century, saw anything resembling the hockey-stick upturn in living standards experienced by the countries in Figures 1.1a and 1.1b.

We learn two things from Figures 1.1a and 1.1b:

- For a very long time, living standards did not grow in any sustained way.
- When sustained growth occurred, it began at different times in different countries, leading to vast differences in living standards around the world.

Jutta Bolt and Jan Juiten van Zanden. 2013. 'The First Update of the Maddison Project Re-Estimating Growth Before 1820'. Maddison-Project Working Paper WP-4 (January). Stephen Broadberry. 2013. Accounting for the great divergence. 1 November. Conference Board, The. 2015. Total Economy Database.

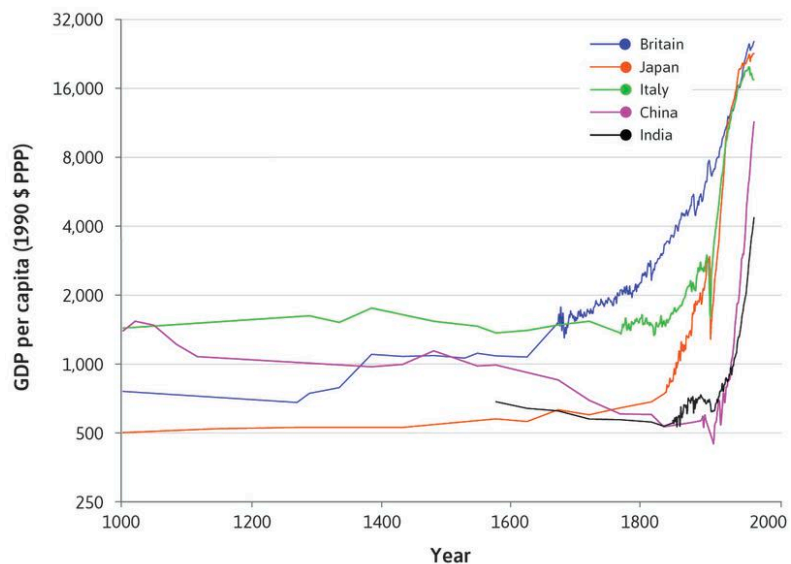


Figure 1.1b History's hockey stick: Living standards in five countries (1000–2015) using the ratio scale.

1. Before 1800 we have fewer data points

For the period before 1800 we have less information about GDP per capita, which is why there are fewer data points in that part of the figure.

2. A line is drawn through the data points

For each country the data points shown at the previous step have been joined with straight lines. Before 1800 we can't see how living standards fluctuated from year to year.

3. Britain

The hockey-stick kink is less abrupt in Britain, where growth began around 1650.

4. Japan

In Japan the kink is more defined, occurring around 1870.

5. China and India

The kink for China and India happened in the second half of the twentieth century. GDP per capita actually fell in India during British colonial rule. You can see that this is also true of China during the same period, when European nations dominated China's politics and economics.

6. Compare growth rates in China and Japan

The ratio scale makes it possible to see that recent growth rates in Japan and China were higher than elsewhere.

Understanding how this occurred has been one of the most important questions that economists have asked, starting with a founder of the field, Adam Smith, who gave his most important book the title *An Inquiry into the Nature and Causes of the Wealth of Nations*.

GREAT ECONOMISTS

Adam Smith

Adam Smith (1723–1790) is considered by many to be the founder of modern economics. Raised by a widowed mother in Scotland, he went on to study philosophy at the University of Glasgow and later at Oxford, where he wrote: ‘the greater part of the ... professors have ... given up altogether even the pretence of teaching.’

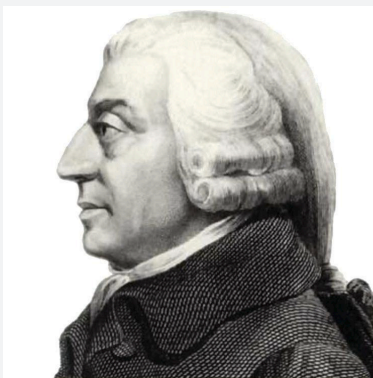
He travelled throughout Europe, visiting Toulouse, France where he claimed to have ‘very little to do’ and thus began ‘to write a book in order to pass away the time.’ This was to become the most famous book in economics.

In *An Inquiry into the Nature and Causes of the Wealth of Nations*, published in 1776, Smith asked: how can society coordinate the independent activities of large numbers of economic actors—producers, transporters, sellers, consumers—often unknown to each other and widely scattered across the world? His radical claim was that coordination among all of these actors might spontaneously arise, without any person or institution consciously attempting to create or maintain it. This challenged previous notions of political and economic organization, in which rulers imposed order on their subjects.

Even more radical was his idea that this could take place as a result of individuals pursuing their self-interest: ‘It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from their regard to their own interest,’ he wrote.

Elsewhere in the *Wealth of Nations*, Smith introduced one of the most enduring metaphors in the history of economics, that of the invisible hand. The businessman, he wrote: ‘intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention. Nor is it always the worse for the society that it was no part of it. By pursuing his own interest he frequently promotes that of the society more effectually than when he really intends to promote it.’

Among Smith’s insights is the idea that a significant source of prosperity is the division of labour or specialization, and that this in turn is constrained by the ‘extent of the market.’ Smith illustrated this idea in a famous passage on the pin factory by observing that ten men, each fully specialized in one or two of 18 distinct operations, could produce close to 50,000 pins a day. But ‘if they had all wrought [pins] separately and independently ... they certainly could not each of them have made twenty, perhaps not one pin in a day.’



An entertaining video (<http://tinyco.re/3761488>) by Hans Rosling, a statistician, shows how some countries got richer and healthier much earlier than others.

Adam Smith. (1776) 2003. *An Inquiry into the Nature and Causes of the Wealth of Nations*. New York, NY: Random House Publishing Group.

Smith, Adam. 1759. *The Theory of Moral Sentiments* (<http://tinyco.re/6582039>). London: Printed for A. Millar, and A. Kincaid and J. Bell.

But such an enormous number of pins could only find buyers if they were sold far from their point of production. Hence specialization was fostered by the construction of navigable canals and the expansion of foreign trade. And the resulting prosperity itself expanded the 'extent of the market', in a virtuous cycle of economic expansion.

Smith did not think that people were guided entirely by self-interest. Seventeen years before *The Wealth of Nations*, he had published a book about ethical behaviour called *The Theory of Moral Sentiments*.

He also understood that the market system had some failings, especially if sellers banded together so as to avoid competing with each other. 'People in the same trade seldom meet together,' he wrote, 'even for merriment and diversion, but the conversation ends in a conspiracy against the public; or in some contrivance to raise prices.'

He specifically targeted monopolies that were protected by governments, such as the British East India Company that not only controlled trade between India and Britain, but also administered much of the British colony there.

He agreed with his contemporaries that a government should protect its nation from external enemies, and ensure justice through the police and the court system. He also advocated government investment in education, and in public works such as bridges, roads, and canals.

Smith is often associated with the idea that prosperity arises from the pursuit of self-interest under free market conditions. However, his thinking on these issues was far more nuanced than he is given credit for.

EXERCISE 1.4 THE ADVANTAGES OF RATIO SCALES

Figure 1.1a (page 2) used a conventional scale for the vertical axis, and Figure 1.1b (page 12) used a ratio scale.

1. For Britain, identify a period of time when its growth rate was increasing and another period in which its growth rate was roughly constant. Which figure did you use, and why?
2. Identify a period during which GDP per capita was shrinking (a negative growth rate) faster than in India. Which figure did you use and why?

QUESTION 1.2 CHOOSE THE CORRECT ANSWER(S)

The GDP per capita of Greece was \$22,494 in 2012 and \$21,966 in 2013. Based on these figures, the growth rate of GDP between 2012 and 2013 (to two decimal places) was:

- ☐ -2.40%
- ☐ 2.35%
- ☐ -2.35%
- ☐ -0.24%

QUESTION 1.3 CHOOSE THE CORRECT ANSWER(S)

Imagine that the GDP per capita of a country had doubled every 100 years. You are asked to draw both linear and ratio scale graphs that plot GDP on the vertical axis, and the year on the horizontal axis. What will be the shapes of the curves?

Linear scale graph	Ratio scale graph
<input type="checkbox"/> An upward-sloping curve with increasing slope (called convex shape)	An upward-sloping straight line
<input type="checkbox"/> An upward-sloping straight line	A straight horizontal line
<input type="checkbox"/> An upward-sloping straight line	An upward-sloping curve with decreasing slope (called concave shape)
<input type="checkbox"/> An upward-sloping convex curve	An upward-sloping convex curve

Note: Linear scale graphs are ‘normal’ graphs in which the difference in height between 1 and 2, and the difference between 2 and 3, would be the same on the vertical axis.

**1.4 THE PERMANENT TECHNOLOGICAL REVOLUTION**

The science fiction show *Star Trek* is set in the year 2264, when humans travel the galaxy with friendly aliens aided by intelligent computers, faster-than-light propulsion, and replicators that create food and medicine on demand. Whether we find the stories silly or inspiring, most of us, in optimistic moods, can entertain the idea that the future will be transformed morally, socially, and materially by technological progress.

No *Star Trek* future awaited the peasant’s grandchildren of 1250. The next 500 years would pass without any measurable change in the standard of living of an ordinary working person. While science fiction began to appear in the seventeenth century (Francis Bacon’s *New Atlantis* being one of the first, in 1627), it was not until the eighteenth century that each new generation could look forward to a different life that was shaped by new technology.

Remarkable scientific and technological advances occurred more or less at the same time as the upward kink in the hockey stick in Britain in the middle of the eighteenth century.

Important new technologies were introduced in textiles, energy and transportation. Its cumulative character led to it being called the **Industrial Revolution**. As late as 1800, traditional craft-based techniques, using skills that had been handed down from one generation to the next, were still used in most production processes. The new era brought new ideas, new discoveries, new methods and new machines, making old ideas and old tools obsolete. These new ways were, in turn, made obsolete by even newer ones.

Industrial Revolution A wave of technological advances and organizational changes starting in Britain in the eighteenth century, which transformed an agrarian and craft-based economy into a commercial and industrial economy.

technology A process taking a set of materials and other inputs, including the work of people and machines, to produce an output.

technological progress A change in technology that reduces the amount of resources (labour, machines, land, energy, time) required to produce a given amount of the output.

In everyday usage, ‘technology’ refers to machinery, equipment and devices developed using scientific knowledge. In economics, **technology** is a process that takes a set of materials and other inputs—including the work of people and machines—and creates an output. For example, a technology for making a cake can be described by the recipe that specifies the combination of inputs (ingredients such as flour, and labour activities such as stirring) needed to create the output (the cake). Another technology for making cakes uses large-scale machinery, ingredients and labour (machine operators).

Until the Industrial Revolution, the economy’s technology, like the skills needed to follow its recipes, was updated only slowly and passed from generation to generation. As **technological progress** revolutionized production, the time required to make a pair of shoes fell by half in only a few decades; the same was true of spinning and weaving, and of making cakes in a factory. This marked the beginning of a permanent technological revolution because the amount of time required for producing most products fell generation after generation.

Technological change in lighting

To get some idea of the unprecedented pace of change, consider the way we produce light. For most of human history technological progress in lighting was slow. Our distant ancestors typically had nothing brighter than a campfire at night. The recipe for producing light (had it existed) would have said: gather lots of firewood, borrow a lighting stick from some other place where a fire is maintained, and start and maintain a fire.

The first great technological breakthrough in lighting came 40,000 years ago, with the use of lamps that burned animal or vegetable oils. We measure technological progress in lighting by how many units of brightness called lumens could be generated by an hour of work. One lumen is approximately the amount of brightness in a square metre of moonlight. One lumen-hour (lm-hr) is this amount of brightness lasting an hour. For example, creating light by a campfire took about 1 hour of labour to produce 17 lm-hr, but animal fat lamps produced 20 lm-hr for the same amount of work. In Babylonian times (1750 BC) the invention of an improved lamp using sesame oil meant that an hour of labour produced 24 lm-hr. Technological progress was slow: this modest improvement took 7,000 years.

Three thousand years later, in the early 1800s, the most efficient forms of lighting (using tallow candles) provided about nine times as much light for an hour of labour as had the animal fat lamps of the past. Since then lighting has become more and more efficient with the development of town gas lamps, kerosene lamps, filament bulbs, fluorescent bulbs and other forms of lighting. Compact fluorescent bulbs introduced in 1992 are about 45,000 times more efficient, in terms of labour time expended, than lights were 200 years ago. Today the productivity of labour in producing light is half a million times greater than it was among our ancestors around their campfire.

Figure 1.3 charts this remarkable hockey-stick growth in efficiency in lighting using the ratio scale we introduced in Figure 1.1b.

The process of innovation did not end with the Industrial Revolution, as the case of labour productivity in lighting shows. It has continued with the application of new technologies in many industries, such as the steam engine, electricity, transportation (canals, railroads, automobiles), and most recently, the revolution in information processing and communication. These broadly applicable technological innovations give a particularly strong impetus to growth in living standards because they change the way that large parts of the economy work.

By reducing the amount of work-time it takes to produce the things we need, technological changes allowed significant increases in living standards. David Landes, an economic historian, wrote that the Industrial Revolution was ‘an interrelated succession of technological changes’ that transformed the societies in which these changes took place.

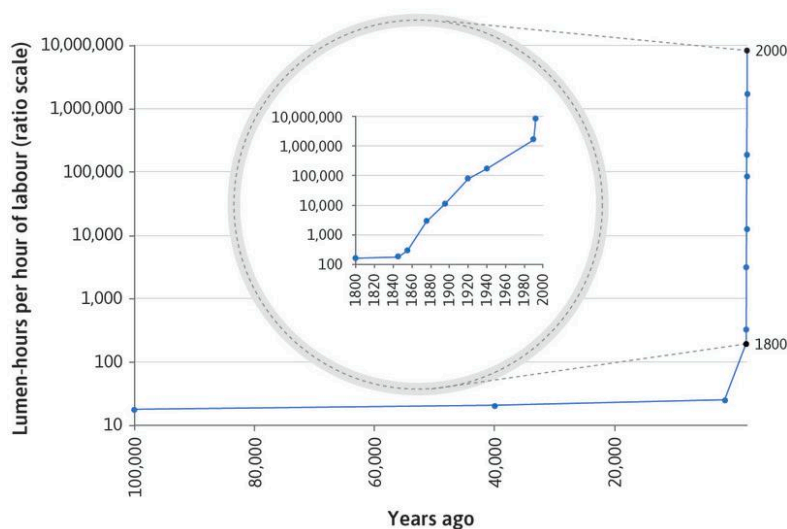
A connected world

In July 2012, the Korean hit ‘Gangnam Style’ was released. By the end of 2012 it had become the best-selling song in 33 countries, including Australia, Russia, Canada, France, Spain and the UK. With 2 billion views by the middle of 2014, ‘Gangnam Style’ also became the most watched video on YouTube. The permanent technological revolution has produced a connected world.

Everyone is part of it. The materials making up this introduction to economics were written by teams of economists, designers, programmers and editors, working together—often simultaneously—at computers in the UK, India, the US, Russia, Colombia, South Africa, Chile, Turkey, France and many other countries. If you are online, some of the transmission of information occurs at close to the speed of light. While most of the commodities traded around the globe still move at the pace of an ocean freighter, about 21 miles (33 km) per hour, international financial transactions are implemented in less time than it took you to read this sentence.

Transformational technological change is still occurring. Hans Rosling claims (<http://tinyco.re/7334115>) that we should say ‘thank you industrialization’ for creating the washing machine, a device that transformed the wellbeing of millions of women.

David S. Landes. 2003. *The Unbound Prometheus: Technological Change and Industrial Development in Western Europe from 1750 to the Present*. Cambridge: Cambridge University Press.



William Nordhaus. 1998. ‘Do Real Output and Real Wage Measures Capture Reality? The History of Lighting Suggests Not’. Cowles Foundation For Research in Economics Paper 1078.

Figure 1.3 The productivity of labour in producing light.

The speed at which information travels provides more evidence of the novelty of the permanent technological revolution. By comparing the known date of a historical event with the date at which the event was first noted in other locations (in diaries, journals or newspapers) we can determine the speed at which news travelled. When Abraham Lincoln was elected US president in 1860, for example, the word was spread by telegraph from Washington to Fort Kearny, which was at the western end of the telegraph line. From there the news was carried by a relay of riders on horseback called the Pony Express, covering 1,260 miles (2,030 km) to Fort Churchill in Nevada, from where it was transmitted to California by telegraph. The process took seven days and 17 hours. Over the Pony Express segment of the route, the news travelled at 7 miles (11 km) per hour. A half-ounce (14 gram) letter carried over this route cost \$5, or the equivalent of five days' wages.

From similar calculations we know that news travelled between ancient Rome and Egypt at about 1 mile (1.6 km) per hour, and 1,500 years later between Venice and other cities around the Mediterranean it was, if anything, slightly slower. But, a few centuries later, as Figure 1.4 shows, the pace began to quicken. It took 'only' 46 days for the news of a mutiny of Indian troops against British rule in 1857 to reach London, and readers of the *Times* of London knew of Lincoln's assassination only 13 days after the event. One year after Lincoln's death a transatlantic cable cut the time for news to travel between New York and London to a matter of minutes.



1.5 THE ECONOMY AND THE ENVIRONMENT

Humans have always relied on their environment for the resources they need to live and produce their livelihoods: the physical environment and the biosphere, which is the collection of all forms of life on earth, provide essentials for life such as air, water and food. The environment also provides the raw materials that we use in the production of other goods—such as wood, metals, and oil.

Tables 15.2 and 15.3 from Gregory Clark. 2007. *A Farewell to Alms: A Brief Economic History of the World*. Princeton, NJ: Princeton University Press.

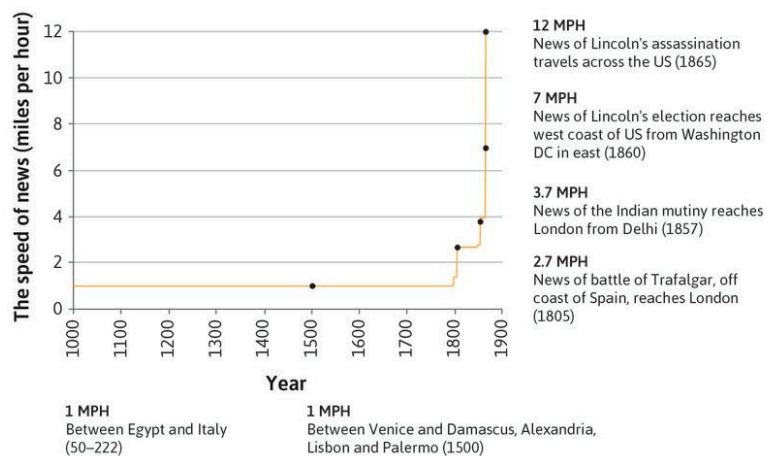


Figure 1.4 The speed at which information travelled (1000–1865).

Figure 1.5 shows one way of thinking about the economy: it is part of a larger social system, which is itself part of the biosphere. People interact with each other, and also with nature, in producing their livelihood.

Through most of their history, humans have regarded natural resources as freely available in unlimited quantities (except for the costs of extracting them). But as production has soared (see Figures 1.1a and 1.1b), so too have the use of our natural resources and degradation of our natural environment. Elements of the ecological system such as air, water, soil, and weather have been altered by humans more radically than ever before.

The most striking effect is climate change. Figures 1.6a and 1.6b present evidence that our use of fossil fuels—coal, oil, and natural gas—have profoundly affected the natural environment. After having remained relatively unchanged for many centuries, increasing emissions of carbon dioxide (CO₂) into the air during the twentieth century have resulted in measurably larger amounts of CO₂ in the earth's atmosphere (Figure 1.6a) and brought about perceptible increases in the northern hemisphere's average temperatures (Figure 1.6b). Figure 1.6a also shows that CO₂ emissions from fossil fuel consumption have risen dramatically since 1800.

EXERCISE 1.5 HOW MUCH DIFFERENCE DOES A COUPLE OF DEGREES WARMER OR COLDER MAKE?

Between 1300 and 1850 there were a number of exceptionally cold periods as you can see from Figure 1.6b (page 20). Research this so-called 'little ice age' in Europe and answer the following.

1. Describe the effects of these exceptionally cold periods on the economies of these countries.
2. Within a country or region, some groups of people were exceptionally hard hit by the climate change while others were less affected. Provide examples.
3. How 'extreme' were these cold periods compared to the temperature increases since the mid-twentieth century and those projected for the future?

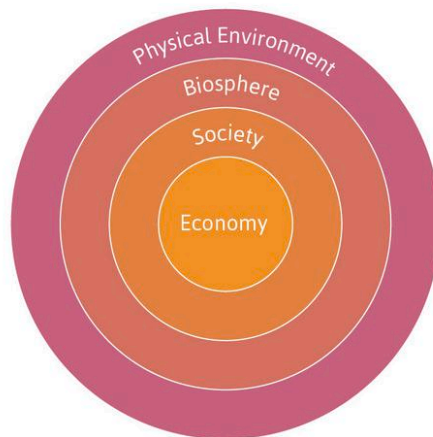


Figure 1.5 The economy is part of society, which is part of the biosphere.

Figure 1.6b shows that the average temperature of the earth fluctuates from decade to decade. Many factors cause these fluctuations, including volcanic events such as the 1815 Mount Tambora eruption in Indonesia. Mount Tambora spewed so much ash that the earth's temperature was reduced by the cooling effect of these fine particles in the atmosphere, and 1816 became known as the 'year without a summer'.

Since 1900, average temperatures have risen in response to increasingly high levels of greenhouse gas concentrations. These have mostly resulted from the CO₂ emissions associated with the burning of fossil fuels.

The human causes and the reality of climate change are no longer widely disputed in the scientific community. The likely consequences of global warming are far-reaching: melting of the polar ice caps, rising sea levels that may put large coastal areas under water, and potential changes in climate and rain patterns that may destroy the world's food-growing areas. The long-term physical and economic consequences of these changes, and the appropriate policies that governments could adopt as a result, are discussed in detail in Unit 20 (Economics of the environment).

Climate change is a global change. But many of the environmental impacts of burning fossil fuels are local, as residents of cities suffer respiratory and other illnesses as a result of high levels of harmful emissions from power plants, vehicles, and other sources. Rural communities, too, are impacted by deforestation (another cause of climate change) and the depletion of the supply of clean water and fishing stocks.

From global climate change to local resource exhaustion, these effects are results of both the expansion of the economy (illustrated by the growth

The authoritative source for research and data about climate change is the Intergovernmental Panel on Climate Change (<http://tinyco.re/8844088>).

Years 1010–1975: David M. Etheridge, L. Paul Steele, Roger J. Francey, and Ray L. Langenfelds. 2012. 'Historical Record from the Law Dome DE08, DE08-2, and DSS Ice Cores'. Division of Atmospheric Research, CSIRO, Aspendale, Victoria, Australia. Years 1976–2010: Data from Mauna Loa observatory. T. A. Boden, G. Marland, and Robert J. Andres. 2010. 'Global, Regional and National Fossil-Fuel CO₂ Emissions'. Carbon Dioxide Information Analysis Center (CDIAC) Datasets.

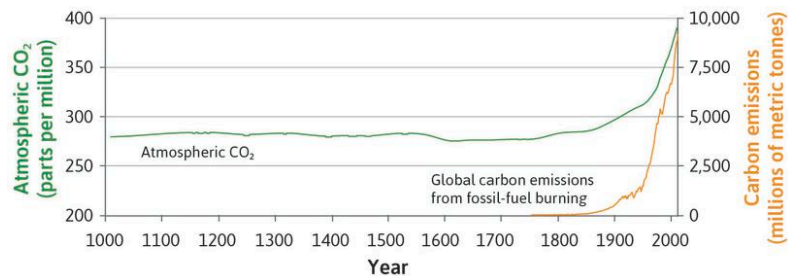


Figure 1.6a Carbon dioxide in the atmosphere (1010–2010) and global carbon emissions from burning fossil fuels (1750–2010).

Michael E. Mann, Zhihua Zhang, Malcolm K. Hughes, Raymond S. Bradley, Sonya K. Miller, Scott Rutherford, and Fenbiao Ni. 2008. 'Proxy-based reconstructions of hemispheric and global surface temperature variations over the past two millennia'. *Proceedings of the National Academy of Sciences* 105 (36): pp. 13252–13257.

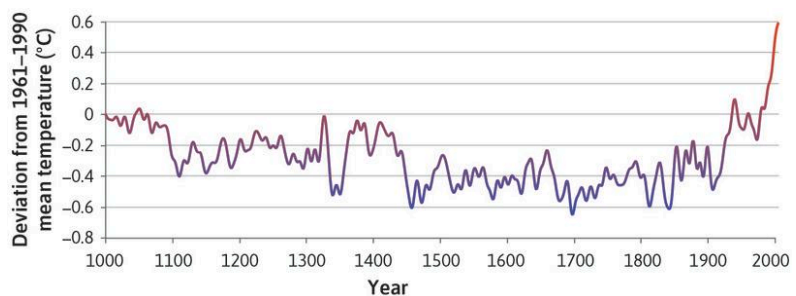


Figure 1.6b Northern hemisphere temperatures over the long run (1000–2006).

in total output) and the way the economy is organized (what kinds of things are valued and conserved, for example). The relationship between the economy and the environment shown in Figure 1.5 is two-way: we use natural resources in production, which may in turn affect the environment we live in and its capacity to support future production.

But the permanent technological revolution—which brought about dependence on fossil fuels—may also be part of the solution to today's environmental problems.

Look back at Figure 1.3, which showed the productivity of labour in producing light. The vast increases shown over the course of history and especially since the mid-nineteenth century occurred largely because the amount of light produced per unit of heat (for example from a campfire, candle, or light bulb) increased dramatically.

In lighting, the permanent technological revolution brought us more light for less heat, which conserved natural resources—from firewood to fossil fuels—used in generating the heat. Advances in technology today may allow greater reliance on wind, solar and other renewable sources of energy.

QUESTION 1.4 CHOOSE THE CORRECT ANSWER(S)

Which of the following variables have followed the so-called 'hockey-stick' trajectory—that is, little to no growth for most of history followed by a sudden and sharp change to a positive growth rate?

- ☐ GDP per capita
- ☐ labour productivity
- ☐ inequality
- ☐ atmospheric CO₂



1.6 CAPITALISM DEFINED: PRIVATE PROPERTY, MARKETS, AND FIRMS

Looking back over the data in Figures 1.1a (page 2), 1.1b (page 12), 1.3 (page 17), 1.4 (page 18) and 1.6 (page 20) we see an upward turn, like the kink in our hockey stick, repeated for:

- gross domestic product per capita
- productivity of labour (light per hour of work)
- connectivity of the various parts of the world (the speed at which news travels)
- impact of the economy on the global environment (carbon emissions and climate change)

How can we explain the change from a world in which living conditions changed little unless there was an epidemic or a war, to one in which each generation is noticeably, and predictably, better off than the previous one?

An important part of our answer will be what we call the capitalist revolution: the emergence in the eighteenth century and eventual global spread of a way of organizing the economy that we now call capitalism. The term 'capitalism'—which we will define shortly—was barely heard of a century ago, but as you can see from Figure 1.7, its use has skyrocketed

capitalism An economic system in which private property, markets, and firms play an important role.

economic system The institutions that organize the production and distribution of goods and services in an entire economy.

institution The laws and social customs governing the way people interact in society.

PRIVATE PROPERTY

This means that you can:

- enjoy your possessions in a way that you choose
- exclude others from their use if you wish
- dispose of them by gift or sale to someone else ...
- ... who becomes their owner

since then. The figure shows the fraction of all articles in the *New York Times* (excluding the sports section) that include the term ‘capitalism.’

Capitalism is an **economic system** characterized by a particular combination of **institutions**. An economic system is a way of organizing the production and distribution of goods and services in an entire economy. And by institutions, we mean the different sets of laws and social customs regulating production and distribution in different ways in families, private businesses, and government bodies.

In some economies in the past, the key economic institutions were **private property** (people owning things), markets (where goods could be bought and sold) and families. Goods were usually produced by families working together, rather than by firms with owners and employees.

In other societies, the government has been the institution controlling production, and deciding how goods should be distributed, and to whom. This is called a centrally planned economic system. It existed, for example, in the Soviet Union, East Germany and many other eastern European countries prior to the end of Communist Party rule in the early 1990s.

Though governments and families are essential parts of the workings of every economy, most economies today are capitalist. Since most of us live in capitalist economies, it is easy to overlook the importance of institutions that are fundamental for capitalism to work well. They are so familiar, we hardly ever notice them. Before seeing how private property, markets and firms combine in the capitalist economic system, we need to define them.

Over the course of human history, the extent of private property has varied. In some societies, such as the hunters and gatherers who are our distant ancestors, almost nothing except personal ornaments and clothing was owned by individuals. In others, crops and animals were private property, but land was not. The right to use the land was granted to families by consensus among members of a group, or by a chief, without allowing the family to sell the plot.

In other economic systems some human beings—slaves—were private property.

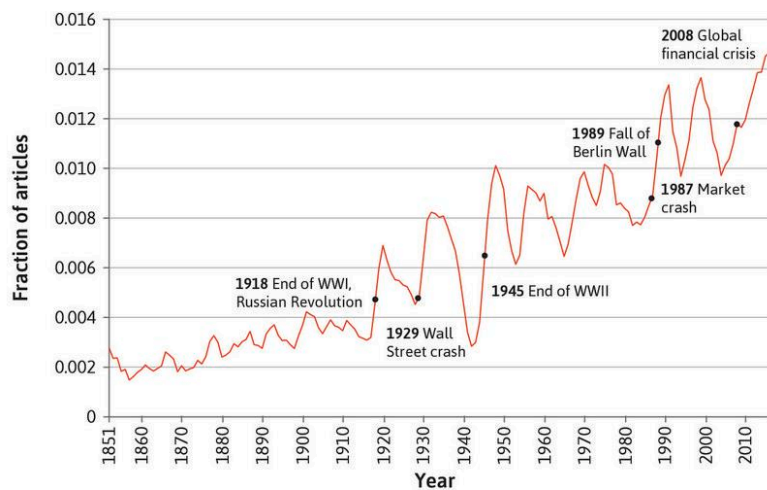


Figure 1.7 Mention of the word ‘capitalism’ in *New York Times* articles (1851–2015).

Calculations by Simon DeDeo, Santa Fe Institute, from *New York Times*. 2016. ‘NYT article archive’.

In a capitalist economy, an important type of private property is the equipment, buildings, raw materials, and other inputs used in producing goods and services. These are called **capital goods**.

Private property may be owned by an individual, a family, a business, or some entity other than the government. Some things that we value are not private property: for example, the air we breathe and most of the knowledge we use cannot be owned or bought and sold.

capital goods The equipment, buildings, raw materials, and other inputs used in producing goods and services, including where applicable any patents or other intellectual property that is used.

QUESTION 1.5 CHOOSE THE CORRECT ANSWER(S)

Which of the following are examples of private property?

- ☐ computers belonging to your college
- ☐ a farmer's land in Soviet Russia
- ☐ shares in a company
- ☐ a worker's skills

Markets are a means of transferring goods or services from one person to another. There are other ways, such as by theft, a gift, or a government order. **Markets** differ from these in three respects:

They are reciprocated: unlike gifts and theft, one person's transfer of a good or service to another is directly reciprocated by a transfer in the other direction (either of another good or service as in barter exchange, or money, or a promise of a later transfer when one buys on credit). They are voluntary: Both transfers—by the buyer and the seller—are voluntary because the things being exchanged are private property. So the exchange must be beneficial in the opinion of both parties. In this, markets differ from theft, and also from the transfers of goods and services in a centrally planned economy.

In most markets there is competition. A seller charging a high price, for example, will find that buyers prefer to buy from other competing sellers.

MARKETS

Markets are:

- a way of connecting people who may mutually benefit
- by exchanging goods and services
- through a process of buying and selling

EXERCISE 1.6 THE POOREST MAN'S COTTAGE

'The poorest man may in his cottage bid defiance to all the forces of the Crown. It may be frail, its roof may shake; the wind may blow through it; the storms may enter, the rain may enter—but the King of England cannot enter; all his forces dare not cross the threshold of the ruined tenement.' – William Pitt, 1st Earl of Chatham, speech in the British Parliament (1763).

1. What does this tell us about the meaning of private property?
2. Does it apply to people's homes in your country?

EXERCISE 1.7 MARKETS AND SOCIAL NETWORKS

Think about a social networking site that you use, for example Facebook. Now look at our definition of a market.

What are the similarities and differences between that social networking site and a market?

QUESTION 1.6 CHOOSE THE CORRECT ANSWER(S)

Which of the following are examples of markets?

- ☐ wartime food rationing
- ☐ auction websites such as eBay
- ☐ touts selling tickets outside concert halls
- ☐ sale of illegal arms

FIRM

A firm is a way of organizing production with the following characteristics:

- One or more individuals own a set of capital goods that are used in production.
- They pay wages and salaries to employees.
- They direct the employees (through the managers they also employ) in the production of goods and services.
- The goods and services are the property of the owners.
- The owners sell the goods and services on markets with the intention of making a profit.

labour market In this market, employers offer wages to individuals who may agree to work under their direction. Economists say that employers are on the demand side of this market, while employees are on the supply side. See also: *labour force*.

demand side The side of a market on which those participating are offering money in return for some other good or service (for example, those purchasing bread). See also: *supply side*.

supply side The side of a market on which those participating are offering something in return for money (for example, those selling bread). See also: *demand side*.

But private property and markets alone do not define capitalism. In many places they were important institutions long before capitalism. The most recent of the three components making up the capitalist economy is the **firm**.

The kinds of firms that make up a capitalist economy include restaurants, banks, large farms that pay others to work there, industrial establishments, supermarkets, and internet service providers. Other productive organizations that are not firms and which play a lesser role in a capitalist economy include family businesses, in which most or all of the people working are family members, non-profit organizations, employee-owned cooperatives, and government-owned entities (such as railways and power or water companies). These are not firms, either because they do not make a profit, or because the owners are not private individuals who own the assets of the firm and employ others to work there. Note: a firm pays wages or salaries to employees but, if it takes on unpaid student interns, it is still a firm.

Firms existed, playing a minor role, in many economies long before they became the predominant organizations for the production of goods and services, as in a capitalist economy. The expanded role of firms created a boom in another kind of market that had played a limited role in earlier economic systems: the **labour market**. Firm owners (or their managers) offer jobs at wages or salaries that are high enough to attract people who are looking for work.

In economic language, the employers are the **demand side** of the labour market (they 'demand' employees), while the workers are the **supply side**, offering to work under the direction of the owners and managers who hire them.

A striking characteristic of firms, distinguishing them from families and governments, is how quickly they can be born, expand, contract and die. A successful firm can grow from just a few employees to a global company with hundreds of thousands of customers, employing thousands of people, in a few years. Firms can do this because they are able to hire additional employees on the labour market, and attract funds to finance the purchase of the capital goods they need to expand production.

Firms can die in a few years too. This is because a firm that does not make profits will not have enough money (and will not be able to borrow money) to continue employing and producing. The firm shrinks, and some of the people who work there lose their jobs.

Contrast this with a successful family farm. The family will be better off than its neighbours; but unless it turns the family farm into a firm, and employs other people to work on it, expansion will be limited. If, instead, the family is not very good at farming, then it will simply be less well off than its neighbours. The family head cannot dismiss the children as a firm might get rid of unproductive workers. As long as the family can feed itself

there is no equivalent mechanism to a firm's failure that will automatically put it out of business.

Government bodies also tend to be more limited in their capacity to expand if successful, and are usually protected from failure if they perform poorly.

Defining capitalism precisely

In everyday language, the word 'capitalism' is used in different ways, in part because people have strong feelings about it. In the language of economics, we use the term in a precise way because that helps us to communicate: we define capitalism as an economic system combining three institutions, each of which we need in turn to define.

'Capitalism' refers not to a specific economic system, but to a class of systems sharing these characteristics. How the institutions of capitalism—private property, markets, and firms—combine with each other and with families, governments, and other institutions differs greatly across countries. Just as ice and steam are both 'water' (defined chemically as a compound of two hydrogen atoms bonded with one oxygen atom), China and the US are both capitalist economies. But they differ in the extent to which the government influences economic affairs, and in many other ways. As this demonstrates, definitions in the social sciences often cannot be as precise as they are in the natural sciences.

Some people might say that 'ice is not really water', and object that the definition is not the 'true meaning' of the word. But debates about the 'true' meaning (especially when referring to complex abstract ideas like capitalism, or democracy) forget why definitions are valuable. Think of the definition of water, or of capitalism, not as capturing some true meaning—but rather as a device that is valuable because it makes it easier to communicate.

Definitions in the social sciences often cannot be as precise as they are in the natural sciences. Unlike water, we cannot identify a capitalist economic system using easy-to-measure physical characteristics.



1.7 CAPITALISM AS AN ECONOMIC SYSTEM

Figure 1.8 shows that the three parts of the definition of a capitalist economic system are nested concepts. The left-hand circle describes an economy of isolated families who own their capital goods and the goods they produce, but have little or no exchange with others.

In a capitalist system, production takes place in firms. Markets and private property are essential parts of how firms function for two reasons:

- *Inputs and outputs are private property:* The firm's buildings, equipment, patents, and other inputs into production, as well as the resulting outputs, belong to the owners.
- *Firms use markets to sell outputs:* The owners' profits depend on markets in which customers may willingly purchase the products at a price that will more than cover production costs.

Historically, economies like the left-hand circle have existed, but have been much less important than a system in which markets and private property are combined (the middle circle). Private property is an essential condition for the operation of markets: buyers will not want to pay for goods unless

EXERCISE 1.8 CAPITALISM

Look again at Figure 1.7 (page 22).

1. Can you suggest an explanation for why the usage of the term capitalism spikes when it does?
2. Why do you think it has remained so high since the late 1980s?

Paul Seabright. 2010. *The Company of Strangers: A Natural History of Economic Life* (Revised Edition). Princeton, NJ: Princeton University Press.

ownership The right to use and exclude others from the use of something, and the right to sell the thing that is owned.

they can have the right to own them. In the middle circle most production is done either by individuals (shoemakers or blacksmiths, for example) or in families (for example, on a farm). Prior to 1600 a great many of the economies of the world were like this.

The distinctive hallmark of the capitalist economic system is the private **ownership of capital goods** that are organized for use in firms. Other economic systems are distinctive because of the importance of privately owned land, the presence of slaves, because the government owns capital goods, or because of the limited role of firms. Capitalist economies differ, too, from earlier economies in the magnitude of the capital goods used in production. Massive power looms have replaced spinning wheels; a tractor now pulls a plough to do a job once done by a farmer using a hoe.

Capitalism is an economic system that combines centralization with decentralization. It concentrates power in the hands of owners and managers of firms who are then able to secure the cooperation of large numbers of employees in the production process. But it limits the powers of owners and of other individuals, because they face competition to buy and sell in markets.

So when the owner of a firm interacts with an employee, he or she is 'the boss'. But when the same owner interacts with a potential customer he or she is simply another person trying to make a sale, in competition with other firms. It is this unusual combination of competition among firms, and concentration of power and cooperation within them, that accounts for capitalism's success as an economic system.

How could capitalism lead to growth in living standards?

Two major changes accompanied the emergence of capitalism, both of which enhanced the productivity of individual workers:

Technology

As we have seen, the permanent technological revolution coincided with the transition to firms as the predominant means of organizing production. This does not mean that firms necessarily caused technological change. But firms competing with each other in markets had strong incentives to adopt and develop new and more productive technologies, and to invest in capital goods that would have been beyond the reach of small-scale family enterprises.

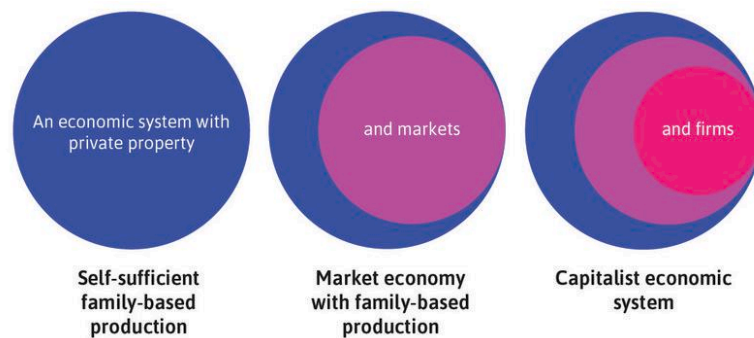


Figure 1.8 Capitalism: Private property, markets and firms.

Specialization

The growth of firms employing large numbers of workers—and the expansion of markets linking the entire world in a process of exchange—allowed historically unprecedented specialization in the tasks and products on which people worked. In the next section, we will see how this specialization can raise labour productivity and living standards.

EXERCISE 1.9 FIRM OR NOT?

Using our definition, explain whether each of the following entities is a firm by investigating if it satisfies the characteristics that define a firm. Research the entity online if you are stuck.

1. John Lewis Partnership (UK)
2. a family farm in Vietnam
3. your current family doctor's office or practice
4. Walmart (US)
5. an eighteenth-century pirate ship (see our description of *The Royal Rover* in Unit 5)
6. Google (US)
7. Manchester United plc (UK)
8. Wikipedia



1.8 THE GAINS FROM SPECIALIZATION

Capitalism and specialization

Look around at the objects in your workspace. Do you know the person who made them? What about your clothing? Or anything else in sight from where you are sitting?

Now imagine that it is 1776, the year that Adam Smith wrote *The Wealth of Nations*. The same questions, asked anywhere in the world, would have had a different answer.

At that time many families produced a wide array of goods for their own use, including crops, meat, clothing, even tools. Many of the things that you might have spotted in Adam Smith's day would have been made by a member of the family, or of the village. You would have made some objects yourself; others would have been made locally and purchased from the village market.

One of the changes that was underway during Adam Smith's life, but has greatly accelerated since, is specialization in the production of goods and services. As Smith explained, we become better at producing things when we each focus on a limited range of activities. This is true for three reasons:

- *Learning by doing*: We acquire skills as we produce things.
- *Difference in ability*: For reasons of skill, or natural surroundings such as the quality of the soil, some people are better at producing some things than others.
- *economies of scale*: Producing a large number of units of some good is often more cost-effective than producing a smaller number. We investigate this in more detail in Unit 7.

economies of scale These occur when doubling all of the inputs to a production process more than doubles the output. The shape of a firm's long-run average cost curve depends both on returns to scale in production and the effect of scale on the prices it pays for its inputs. Also known as: *increasing returns to scale*. See also: *diseconomies of scale*.

These are the advantages of working on a limited number of tasks or products. People do not typically produce the full range of goods and services that they use or consume in their daily life. Instead we specialize, some producing one good, others producing other goods, some working as welders, others as teachers or farmers.

But people will not specialize unless they have a way to acquire the other goods they need.

For this reason, specialization—called the division of labour—poses a problem for society: how are the goods and services to be distributed from the producer to the final user? In the course of history, this has happened in a number of distinct ways, from direct government requisitioning and distribution as was done in the US and many economies during the Second World War, to gifts and voluntary sharing as we do in families today and as practiced among even unrelated members of a community by our hunting and gathering ancestors. Capitalism enhanced our opportunities for specialization by expanding the economic importance of both markets and firms.

Specialization exists within governments and also in families, where who does which household chore is often associated with age and gender. Here we look at the division of labour in firms and in markets.

The division of labour in firms

Adam Smith begins *The Wealth of Nations* with the following sentence:

The greatest improvement in the productive powers of labour, and the greater part of the skill, dexterity, and judgment with which it is anywhere directed, or applied, seem to have been the effects of the division of labour.

He went on to describe a pin factory in which the specialization of tasks among the working men allowed a level of productivity—pins produced per day—that seemed to him extraordinary. Firms may employ thousands or even hundreds of thousands of individuals, most of them working at specialized tasks under the direction of the owners or manager of the firm.

This description of the firm stresses its hierarchical nature from top to bottom. But you can also think of the firm as a means by which large numbers of people, each with distinct skills and capacities, contribute to a common outcome, the product. The firm thus facilitates a kind of cooperation among specialized producers that increases productivity.

We return to the question of who does what within the firm and why in Unit 6.

Markets, specialization, and comparative advantage

Chapter 3 in *The Wealth of Nations* is titled: ‘That the Division of Labour is Limited by the Extent of the Market’, in which Smith explains:

When the market is very small, no person can have any encouragement to dedicate himself entirely to one employment, for want of the power to exchange all that surplus part of the produce of his own labour, which is over and above his own consumption, for such parts of the produce of other men’s labour as he has occasion for.

When you hear the word ‘market’ what word do you think of? ‘Competition’ probably is what came to mind. And you would be right to associate the two words.

But you might have also come up with ‘cooperation’. Why? Because markets allow each of us pursuing our private objectives to work together, producing and distributing goods and services in a way that, while far from perfect, is in many cases better than the alternatives.

Markets accomplish an extraordinary result: unintended cooperation on a global scale. The people who produced the phone on your desk did not know or care about you; they produced it rather than you because they are better at producing phones than you are, and you ended up with it because you paid them, allowing them to buy goods that they need, also produced by total strangers to them.

A simple example illustrates how, when people differ in their ability to produce different goods, markets allow them to specialize. It shows something surprising: all producers can benefit by specializing and trading goods, even when this means that one producer specializes in a good that another could produce at lower cost.

Imagine a world of just two individuals (Greta and Carlos) who each need both of two goods, apples and wheat, to survive. They differ in how productive they are in growing apples and wheat. If Greta spent all her time, say, 2,000 hours in a year, producing apples, she would produce 1,250. If she only produced wheat, she would produce 50 tonnes per annum. Carlos has less fertile land than Greta for producing both crops: if he devoted all his time (the same amount as Greta) to apple growing, he would produce 1,000 per year, and if he produced only wheat he would produce 20 tonnes. See Figure 1.9a for a summary.

Although Carlos’ land is worse for producing both crops, his disadvantage is less, relative to Greta, in apples than in wheat. Greta can produce two and a half times more wheat as he can but only 25% more apples.

Economists distinguish who is better at producing what in two ways: absolute advantage and comparative advantage.

Greta has an **absolute advantage** in both crops. Carlos has an absolute disadvantage. She can produce more of either crop than he can.

Greta has a comparative advantage in wheat; Carlos has a **comparative advantage** in apples. Although she is better, Carlos is least disadvantaged in producing apples. Greta has a comparative advantage in producing wheat.

Initially, Carlos and Greta are not able to trade with each other. Both must be self-sufficient, consuming exactly what they produce, so they will each produce both goods in order to survive.

absolute advantage A person or country has this in the production of a good if the inputs it uses to produce this good are less than in some other person or country. See also: *comparative advantage*.

comparative advantage A person or country has comparative advantage in the production of a particular good, if the cost of producing an additional unit of that good relative to the cost of producing another good is lower than another person or country’s cost to produce the same two goods. See also: *absolute advantage*.

Production if 100% of time is spent on one good	
Greta	1,250 apples or 50 tonnes of wheat
Carlos	1,000 apples or 20 tonnes of wheat

Figure 1.9a Absolute and comparative advantage in the production of apples and wheat.

Greta chooses to use 40% of her time in apple production, and the rest producing wheat. Column 1 of Figure 1.9b shows that she produces and consumes 500 apples and 30 tonnes of wheat. Carlos' consumption is also shown: he spends 30% of his time producing apples, and 70% producing wheat.

Now suppose that there are markets where apples and wheat may be bought and sold, and that 40 apples can be bought for the price of 1 tonne of wheat. If Greta specializes in growing wheat only, producing 50 tonnes of wheat and no apples, while Carlos specializes in apples, total production of both crops will be higher than it was under self-sufficiency (column 2). Then they can each sell some of their own crop in the market, and buy some of the good that the other produced.

For example, if Greta sells 15 tonnes of wheat (column 3) in order to buy 600 apples, she can now consume more apples and more wheat than before (column 4). And the table shows that buying the 15 tonnes of wheat produced by Greta, in return for 600 apples, similarly enables Carlos to consume more of both goods than was possible in the absence of specialization and trade.

In constructing this example we assumed market prices are such that a tonne of wheat could be exchanged for 40 apples. We will return to how markets work in Units 7 to 12, but Exercise 1.10 shows that this assumption was not critical. There are other prices at which both Greta and Carlos would benefit from trading with each other.

The opportunity to trade—that is, the existence of an apple market and a wheat market—has benefited both Greta and Carlos. This was possible because specializing in the production of a single good increased the total amount of each good produced, from 800 to 1,000 apples and from 44 to 50 tonnes of wheat. The surprising thing mentioned above is that Greta ended up buying 600 apples from Carlos even though she could have produced those apples at a lower cost herself (in terms of labour time). This was a better way to spend their time because while Greta had an absolute advantage in producing both goods, Carlos had a comparative advantage in producing apples.

		Self-sufficiency	Complete specialization and trade		
			Production	Trade	Consumption
		1	2	3	4
Greta	Apples	500	0		600
	Wheat	30	50	= 15 +	35
Carlos	Apples	300	1,000	= 600 +	400
	Wheat	14	0		15
Total	Apples	800	1,000	600	1,000
	Wheat	44	50	15	50

Figure 1.9b Comparing self-sufficiency and specialization. Under self-sufficiency, both consume exactly what they produce. Under complete specialization, Greta produces only wheat; Carlos produces only apples; and they trade the surplus of their production above what they consume.

Markets contribute to increasing the productivity of labour—and can therefore help to explain the hockey stick of history—by allowing people to specialize in the production of goods for which they have a comparative advantage, that is the things at which they are—relatively speaking—least bad!

EXERCISE 1.10 APPLES AND WHEAT

Suppose that market prices were such that 35 apples could be bought for 1 tonne of wheat.

1. If Greta sold 16 tonnes of wheat, would both she and Carlos still be better off?
2. What would happen if only 20 apples could be bought for the price of a tonne of wheat?



1.9 CAPITALISM, CAUSATION AND HISTORY'S HOCKEY STICK

We have seen that the institutions associated with capitalism have the potential to make people better off, through opportunities for both specialization and the introduction of new technologies, and that the permanent technological revolution coincided with the emergence of capitalism. But can we conclude that capitalism caused the upward kink in the hockey stick?

We should be sceptical when anyone claims that something complex (capitalism) 'causes' something else (increased living standards, technological improvement, a networked world, or environmental challenges).

In science, we support the statement that X causes Y by understanding the relationship between cause (X) and effect (Y) and performing experiments to gather evidence by measuring X and Y.

We want to make **causal** statements in economics—to understand why things happen, or to devise ways of changing something so that the economy works better. This means making a causal statement that policy X is likely to cause change Y. For example, an economist might claim that: 'If the central bank lowers the interest rate, more people will buy homes and cars.'

But an economy is made up of the interactions of millions of people. We cannot measure and understand them all, and it is rarely possible to gather evidence by conducting experiments (though in Unit 4 we will give examples of the use of conventional experiments in one area of economics). So how can economists do science? This example shows how the things we observe in the world can help us investigate causes and effects.

causality A direction from cause to effect, establishing that a change in one variable produces a change in another. While a correlation is simply an assessment that two things have moved together, causation implies a mechanism accounting for the association, and is therefore a more restrictive concept. See also: *natural experiment, correlation*.

natural experiment An empirical study exploiting naturally occurring statistical controls in which researchers do not have the ability to assign participants to treatment and control groups, as is the case in conventional experiments. Instead, differences in law, policy, weather, or other events can offer the opportunity to analyse populations as if they had been part of an experiment. The validity of such studies depends on the premise that the assignment of subjects to the naturally occurring treatment and control groups can be plausibly argued to be random.

More detail about Winston Churchill's 'Iron Curtain' speech (<http://tinyco.re/6053919>).

Because we cannot change the past, even if it were practical to conduct experiments on entire populations, we rely on natural experiments. In this interview, Jared Diamond, a biologist, and James Robinson, a professor of government, explain (<http://tinyco.re/8903951>).

HOW ECONOMISTS LEARN FROM FACTS

Do institutions matter for growth in income?

We can observe that capitalism emerged at the same time as, or just before, both the Industrial Revolution and the upward turn in our hockey sticks. This would be consistent with the hypothesis that capitalist institutions were among the causes of the era of continuous productivity growth. But the emergence of a free-thinking cultural environment known as 'The Enlightenment' also predated or coincided with the upturn in the hockey sticks. So was it institutions, or culture, both, or some other set of causes? Economists and historians disagree, as you will see in Unit 2, when we ask 'What were the causes of the Industrial Revolution?'

Scholars in all fields try to narrow the range of things on which they disagree by using facts. For complicated economic questions, like 'Do institutions matter economically?', facts may provide enough information to reach a conclusion.

A method for doing this is called a **natural experiment**. It is a situation in which there are differences in something of interest—a change in institutions for example—that are not associated with differences in other possible causes.

The division of Germany at the end of the Second World War into two separate economic systems—centrally planned in the east, capitalist in the west—provided a natural experiment. During this time a political 'Iron Curtain', as the British Prime Minister Winston Churchill described it, divided the country. It separated two populations that until then had shared the same language, culture, and capitalist economy.

In 1936, before the Second World War, living standards in what later became East and West Germany were the same. This is a suitable setting for using the natural experiment method. Before the war, firms in Saxony and Thuringia were world leaders in automobile and aircraft production, chemicals, optical equipment and precision engineering.

With the introduction of centralized planning in East Germany, private property, markets and firms virtually disappeared. Decisions about what to produce, how much and in which plants, offices, mines and farms were taken not by private individuals, but by government officials. The officials managing these economic organizations did not need to follow the principle of capitalism and produce goods and services that customers would buy at a price above their cost of manufacture.

West Germany remained a capitalist economy.

The East German Communist Party forecast in 1958 that material wellbeing would exceed the level of West Germany by 1961. The failure of this prediction was one of the reasons the Berlin Wall separating East from West Germany was built in 1961. By the time the Berlin Wall fell in 1989, and East Germany abandoned central planning, its GDP per capita was less than half of that of capitalist West Germany. Figure 1.10 shows the different paths taken by these and two other economies from 1950. It uses the ratio scale.

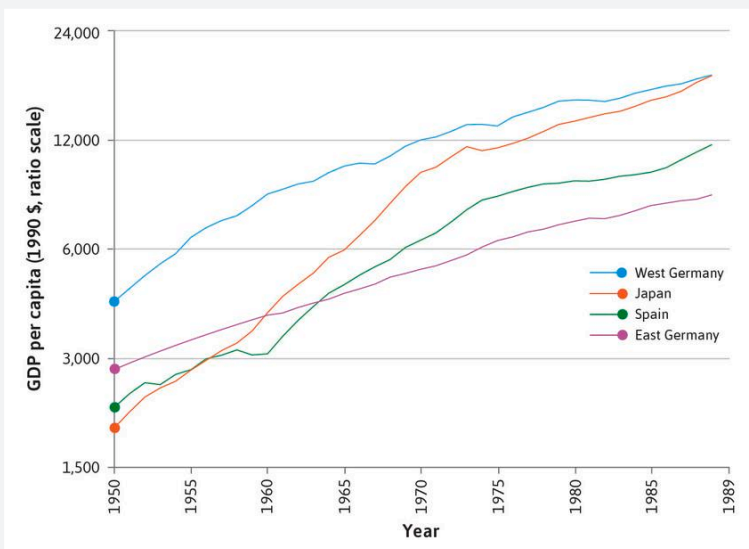


Figure 1.10 The two Germanies: Planning and capitalism (1950–89).

Notice from Figure 1.10 that West Germany started from a more favourable position in 1950 than East Germany. Yet in 1936, before the war began, the two parts of Germany had virtually identical living standards. Both regions had achieved successful industrialization. East Germany's relative weakness in 1950 was not mainly because of differences in the amount of capital equipment or skills available per head of the population, but because the structure of industries in East Germany was more disrupted by splitting the country than was the case in West Germany.

Unlike some capitalist economies that had even lower per capita incomes in 1950, East Germany's planned economy did not catch up to the world leaders, which included West Germany. By 1989, the Japanese economy (which had also suffered war damage) had, with its own particular combination of private property, markets, and firms, along with a strong government coordinating role, caught up to West Germany, and Spain had closed part of the gap.

We cannot conclude from the German natural experiment that capitalism always promotes rapid economic growth while central planning is a recipe for relative stagnation. Instead what we can infer is more limited: during the second half of the twentieth century, the divergence of economic institutions mattered for the livelihoods of the German people.

Conference Board, The. 2015. *Total Economy Database*. Angus Maddison. 2001. 'The World Economy: A Millennial Perspective'. Development Centre Studies. Paris: OECD.

Hartmut Berghoff and Uta Andrea Balbier. 2013. 'From Centrally Planned Economy to Capitalist Avant-Garde? The Creation, Collapse, and Transformation of a Socialist Economy'. In *The East German Economy, 1945–2010: Falling behind or Catching Up?* Cambridge: Cambridge University Press.



1.10 VARIETIES OF CAPITALISM: INSTITUTIONS, GOVERNMENT, AND THE ECONOMY

Not every capitalist country is the kind of economic success story exemplified in Figure 1.1a by Britain, later Japan, and the other countries that caught up. Figure 1.11 tracks the fortunes of a selection of countries across the world during the twentieth century. It shows for example that in Africa the success of Botswana in achieving sustained growth contrasts sharply with Nigeria's relative failure. Both are rich in natural resources (diamonds in Botswana, oil in Nigeria), but differences in the quality of their institutions—the extent of corruption and misdirection of government funds, for example—may help explain their contrasting trajectories.

The star performer in Figure 1.11 is South Korea. In 1950 its GDP per capita was the same as Nigeria's. By 2013 it was ten times richer by this measure.

South Korea's take-off occurred under institutions and policies sharply different from those prevailing in Britain in the eighteenth and nineteenth centuries. The most important difference is that the government of South Korea (along with a few very large corporations) played a leading role in directing the process of development, explicitly promoting some industries, requiring firms to compete in foreign markets and also providing high quality education for its workforce. The term **developmental state** has been applied to the leading role of the South Korean government in its economic take-off and now refers to any government playing this part in the economy. Japan and China are other examples of developmental states.

From Figure 1.11 we also see that in 1928, when the Soviet Union's first five-year economic plan was introduced, GDP per capita was one-tenth of the level in Argentina, similar to Brazil, and considerably higher than in South Korea. Central planning in the Soviet Union produced steady but unspectacular growth for nearly 50 years. GDP per capita in the Soviet

developmental state A government that takes a leading role in promoting the process of economic development through its public investments, subsidies of particular industries, education and other public policies.

World Bank, The. 1993. *The East Asian miracle: Economic growth and public policy*. New York, NY: Oxford University Press.

Jutta Bolt, and Jan Juiten van Zanden. 2013. 'The First Update of the Maddison Project Re-Estimating Growth Before 1820'. Maddison-Project Working Paper WP-4 (January).

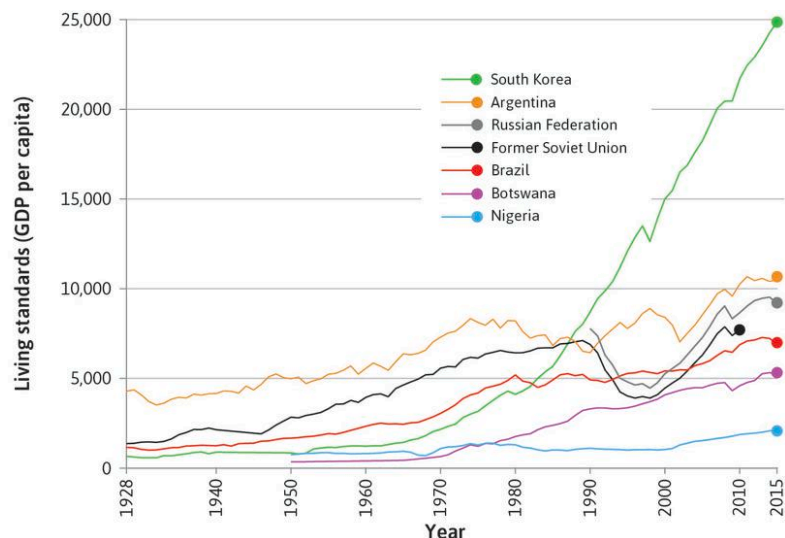


Figure 1.11 Divergence of GDP per capita among latecomers to the capitalist revolution (1928–2015).

Union outstripped Brazil by a wide margin and even overtook Argentina briefly just before Communist Party rule there ended in 1990.

The contrast between West and East Germany demonstrates that one reason central planning was abandoned as an economic system was its failure, in the last quarter of the twentieth century, to deliver the improvements in living standards achieved by some capitalist economies. Yet the varieties of capitalism that replaced central planning in the countries that had once made up the Soviet Union did not work so well either. This is evident from the pronounced dip in GDP per capita for the former Soviet Union after 1990.

When is capitalism dynamic?

The lagging performances of some of the economies in Figure 1.11 demonstrate that the existence of capitalist institutions is not enough, in itself, to create a dynamic economy—that is, an economy bringing sustained growth in living standards. Two sets of conditions contribute to the dynamism of the capitalist economic system. One set is economic; the other is political, and it concerns the government and the way it functions.

Economic conditions

Where capitalism is less dynamic, the explanation might be that:

- *Private property is not secure:* There is weak enforcement of the rule of law and of contracts, or expropriation either by criminal elements or by government bodies.
- *Markets are not competitive:* They fail to offer the carrots and wield the sticks that make a capitalist economy dynamic.
- *Firms are owned and managed by people who survive because of their connections to government or their privileged birth:* They did not become owners or managers because they were good at delivering high-quality goods and services at a competitive price. The other two failures would make this more likely to occur.

Combinations of failures of the three basic institutions of capitalism mean that individuals and groups often have more to gain by spending time and resources in lobbying, criminal activity, and other ways of shifting the distribution of income in their favour. They have less to gain from the direct creation of economic value.

Capitalism is the first economic system in human history in which membership of the elite often depends on a high level of economic performance. As a firm owner, if you fail, you are no longer part of the club. Nobody kicks you out, because that is not necessary: you simply go bankrupt. An important feature of the discipline of the market—produce good products profitably or fail—is that where it works well it is automatic, because having a friend in power is no guarantee that you could remain in business. The same discipline applies to firms and to individuals in firms: losers lose. Market competition provides a mechanism for weeding out those who underperform.

Think of how different this is from other economic systems. A feudal lord who managed his estate poorly was just a shabby lord. But the owner of a firm that could not produce goods that people would buy, at prices that more than covered the cost, is bankrupt—and a bankrupt owner is an ex-owner.

Some researchers question the validity of historical GDP estimates such as this outside of Europe, because the economies of these countries were so different in structure.

János Kornai. 2013. *Dynamism, Rivalry, and the Surplus Economy: Two Essays on the Nature of Capitalism*. Oxford: Oxford University Press.

Dolores Augustine. 2013. 'Innovation and Ideology: Werner Hartmann and the Failure of the East German Electronics Industry'. In *The East German Economy, 1945–2010: Falling behind or Catching Up?* Cambridge: Cambridge University Press.

Daron Acemoglu and James A. Robinson. 2012. *Why Nations Fail: The Origins of Power, Prosperity, and Poverty*. New York, NY: Crown Publishing Group.

Of course, if they are initially very wealthy or very well connected politically, owners and managers of capitalist firms survive, and firms may stay in business despite their failures, sometimes for long periods or even over generations. Losers sometimes survive. But there are no guarantees: staying ahead of the competition means constantly innovating.

Political conditions

Government is also important. We have seen that in some economies—South Korea, for example—governments have played a leading role in the capitalist revolution. And in virtually every modern capitalist economy, governments are a large part of the economy, accounting in some for more than half of GDP. But even where government's role is more limited, as in Britain at the time of its take-off, governments still establish, enforce and change the laws and regulations that influence how the economy works. Markets, private property and firms are all regulated by laws and policies.

For innovators to take the risk of introducing a new product or production process, their ownership of the resulting profits must be protected from theft by a well-functioning legal system. Governments also adjudicate disputes over ownership and enforce the property rights necessary for markets to work.

As Adam Smith warned, by creating or allowing **monopolies** such as the East India Company, governments may also take the teeth out of competition. If a large firm is able to establish a monopoly by excluding all competitors, or a group of firms is able to collude to keep the price high, the incentives for innovation and the discipline of prospective failure will be dulled. The same is true in modern economies when some banks or other firms are considered to be **too big to fail** and instead are bailed out by governments when they might otherwise have failed.

In addition to supporting the institutions of the capitalist economic system, the government provides essential goods and services such as physical infrastructure, education and national defence. In subsequent units we investigate why government policies in such areas as sustaining competition, taxing and subsidizing to protect the environment, influencing the distribution of income, the creation of wealth, and the level of employment and inflation may also make good economic sense.

In a nutshell, capitalism can be a dynamic economic system when it combines:

- *Private incentives for cost-reducing innovation:* These are derived from market competition and secure private property.
- *Firms led by those with proven ability to produce goods at low cost.*
- *Public policy supporting these conditions:* Public policy also supplies essential goods and services that would not be provided by private firms.
- *A stable society, biophysical environment and resource base:* As in Figures 1.5 and 1.12.

These are the conditions that together make up what we term the **capitalist revolution** that, first in Britain and then in some other economies, transformed the way that people interact with each other and with nature in producing their livelihoods.

monopoly A firm that is the only seller of a product without close substitutes. Also refers to a market with only one seller. See also: *monopoly power, natural monopoly.*

too big to fail Said to be a characteristic of large banks, whose central importance in the economy ensures they will be saved by the government if they are in financial difficulty. The bank thus does not bear all the costs of its activities and is therefore likely to take bigger risks. See also: *moral hazard.*

capitalist revolution Rapid improvements in technology combined with the emergence of a new economic system.

Political systems

One of the reasons why capitalism comes in so many forms is that over the course of history and today, capitalist economies have coexisted with many political systems. A **political system**, such as **democracy** or dictatorship, determines how governments will be selected, and how those governments will make and implement decisions that affect the population.

Capitalism emerged in Britain, the Netherlands, and in most of today's high-income countries long before democracy. In no country were most adults eligible to vote prior to the end of the nineteenth century (New Zealand was the first). Even in the recent past, capitalism has coexisted with undemocratic forms of rule, as in Chile from 1973 to 1990, in Brazil from 1964 to 1985, and in Japan until 1945. Contemporary China has a variant of the capitalist economic system, but its system of government is not a democracy by our definition. In most countries today, however, capitalism and democracy coexist, each system influencing how the other works.

Like capitalism, democracy comes in many forms. In some, the head of state is elected directly by the voters; in others it is an elected body, such as a parliament, that elects the head of state. In some democracies there are strict limits on the ways in which individuals can influence elections or public policy through their financial contributions; in others private money has great influence through contributions to electoral campaigns, lobbying, and even illicit contributions such as bribery.

These differences even among democracies are part of the explanation of why the government's importance in the capitalist economy differs so much among nations. In Japan and South Korea, for example, governments play an important role in setting the direction of their economies. But the total amount of taxes collected by government (both local and national) is low compared with some rich countries in northern Europe, where it is almost half of GDP. We shall see in Unit 19 that in Sweden and Denmark, inequality in disposable income (by one of the most commonly used measures) is just half of the level of income inequality before the payment of taxes and receipt of transfers. In Japan and South Korea, government taxes and transfers also reduce inequality in disposable income, but to a far lesser degree.

political system A political system determines how governments will be selected, and how those governments will make and implement decisions that affect all or most members of a population.

democracy A political system, that ideally gives equal political power to all citizens, defined by individual rights such as freedom of speech, assembly, and the press; fair elections in which virtually all adults are eligible to vote; and in which the government leaves office if it loses.

QUESTION 1.7 CHOOSE THE CORRECT ANSWER(S)

Look again at Figure 1.10 (page 33), which shows a graph of GDP per capita for West and East Germany, Japan and Spain between 1950 and 1990. Which of the following statements is correct?

- ☐ Having a much lower starting point in 1950 was the main reason for East Germany's poor performance compared to West Germany.
- ☐ The fact that Japan and West Germany have the highest GDP per capita in 1990 implies that they found the optimal economic system.
- ☐ Spain was able to grow at a higher growth rate than Germany between 1950 and 1990.
- ☐ The difference in East and West Germany's performance proves that capitalism always promotes rapid economic growth while central planning is a recipe for stagnation.

QUESTION 1.8 CHOOSE THE CORRECT ANSWER(S)

Look again at Figure 1.11 (page 34). Which of these conclusions is suggested by the graph?

- ☐ The Communist Party rule in the former Soviet Union before 1990 was a complete failure.
- ☐ The contrasting performances of Botswana and Nigeria illustrate that rich natural resources alone do not guarantee higher economic growth, but that higher quality institutions (government, markets and firms) may also be necessary.
- ☐ The impressive performance of South Korea's economy implies that other countries should copy their economic system.
- ☐ The evidence from the Russian Federation and the former Soviet Union after 1990 shows that the replacement of central planning by capitalism led to immediate economic growth.

economics The study of how people interact with each other and with their natural surroundings in providing their livelihoods, and how this changes over time.

1.11 ECONOMICS AND THE ECONOMY

Economics is the study of how people interact with each other and with their natural surroundings in producing their livelihoods, and how this changes over time. Therefore it is about:

- *How we come to acquire the things that make up our livelihood:* Things like food, clothing, shelter, or free time.
- *How we interact with each other:* Either as buyers and sellers, employees or employers, citizens and public officials, parents, children and other family members.
- *How we interact with our natural environment:* From breathing, to extracting raw materials from the earth.
- *How each of these changes over time.*

In Figure 1.5 we showed that the economy is part of society, which in turn is part of the biosphere. Figure 1.12 shows the position of firms and families in the economy, and the flows that occur within the economy and between the economy and the biosphere. Firms combine labour with structures and equipment, and produce goods and services that are used by households and other firms.

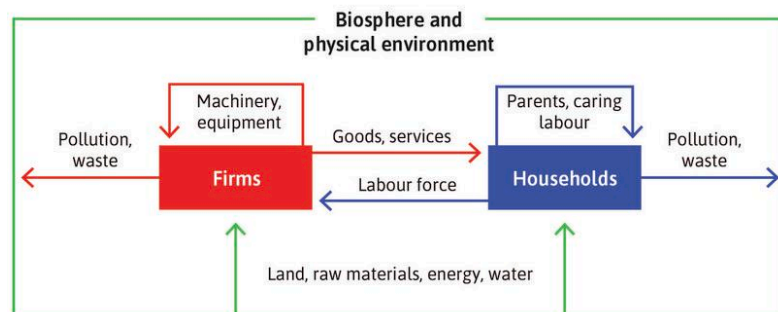


Figure 1.12 A model of the economy: Households and firms.

Production of goods and services also takes place within households, although unlike firms, households may not sell their outputs in the market.

In addition to producing goods and services, households are also producing people—the next generation of the labour force. The labour of parents, caregivers and others is combined with structures (for example, your home) and equipment (for example, the oven in that home) to reproduce and raise the future labour force working in firms, and the people who will work and reproduce in the households of the future.

All of this takes place as part of a biological and physical system in which firms and households make use of our natural surroundings and resources, ranging from fossil-fuel or renewable energy to the air we breathe. In the process, households and firms transform nature by using its resources, but also by producing inputs to nature. Currently, some of the most important of these inputs are the greenhouse gases, which contribute to the climate change problems that we saw in Section 1.5.

EXERCISE 1.11 WHERE AND WHEN WOULD YOU CHOOSE TO HAVE BEEN BORN?

Suppose you can choose to be born in any time period in any of the countries in Figure 1.1a (page 2), 1.10 (page 33) or 1.11 (page 34), but you know that you would be among the poorest 10% in the population.

1. In which country would you choose to be born?
2. Now suppose, instead, you know you would initially be among the poorest 10% in the population, but you would have a fifty-fifty chance of moving to the top 10% of the population if you work hard. In which country would you now choose to be born?
3. Now suppose that you can only decide on the country and time period of your birth. You cannot be sure if you would be born in the city or the countryside, would be male or female, rich or poor. In which time and country would you choose to be born?
4. For the scenario in (3), in which time and country you would least want to be born?

Use what you have learned from this unit to explain your choices.

1.12 CONCLUSION

Throughout most of history, living standards were similar around the world and changed little from century to century. Since 1700 they have risen rapidly in some countries. This upturn coincided with rapid technological progress, and with the advent of a new economic system, capitalism, in which private property, markets and firms play a major role. The capitalist economy provided incentives and opportunities for technological innovation, and gains from specialization.

Countries differ in the effectiveness of their institutions and government policy: not all capitalist economies have experienced sustained growth. Today, there are huge income inequalities between countries, and between the richest and poorest within countries. And the rise in production has been accompanied by depletion of natural resources and environmental damage, including climate change.

Concepts introduced in Unit 1

Before you move on, review these definitions:

- Economics
- Industrial Revolution
- Technology
- Economic system
- Capitalism
- Institutions
- Private property
- Markets
- Firms
- Capitalist revolution
- Democracy

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