16 MACROECONOMIC OBJECTIVE: EQUITY IN INCOME DISTRIBUTION

16.1 Equality *vs* efficiency in market economies

Learning outcomes

- Explain the difference between equity in the distribution of income and equality in the distribution of income.
- Explain that due to unequal ownership of factors of production, the market system may not result in an equitable distribution of income.

Inequality exists in every society, and to an extent is a by-product of the free market system.

Market economies are good at several things:

- allocating resources efficiently in the absence of spillover benefits and costs
- encouraging innovation and creativity when property rights exist to protect the inventions brought to market by entrepreneurs
- achieving increases in total output and average standards of living through the pursuit of self-interest and profits in labour, capital and product markets.

These and myriad other characteristics make market economies more efficient and successful in achieving macroeconomic objectives than the alternative economic systems available to nations.

Command economies, in which society's scarce resources are allocated not by the forces of supply and demand, rather by the very visible hand of the state, failed throughout the 20th century to achieve long-run growth and improvements in the overall living standards of people of the nations in which such economic systems were implemented. What command economies did manage to achieve to some extent, however, was relative equality in the distribution of the nation's income and output across the nation's people. However, critics of the socialist system pointed out that while such economies may have strived to achieve equality, by the time everyone was equal, they were .

Modern market economies, on the other hand, allow for the creation of vast personal wealth and unfathomably high incomes among the most skilled and most well-capitalized members of society. A household's income is not determined by central planners employing complex formulas, but by the productivity of the labour provided by each household to the market. Households with high levels of human capital (in other words, whose skills and education set them apart from other households) enjoy high levels of income. Households whose human capital is of a low level (those whose access to education and skill levels are low) earn lower incomes and experience a lower standard of living. In a truly free market system, higher incomes act as an incentive for households to improve their human capital and work harder to increase their standard of living.

Equality and efficiency: the big trade-off

The gains market economies promote in efficiency, however, are often accompanied by a reduction in equality. There is nothing inherent in a market economy that promotes equality in the distribution of income and output. In fact, much of history has shown quite the opposite to be true. Throughout the late 20th century, as one economy after another emerged from decades of communist economic policies under the Soviet Union (including Russia itself), the gaps between rich and poor grew wider and wider. While average incomes in most emerging market economies have risen, the distribution of income has become increasingly unequal with rising gross domestic product (GDP).

In many countries, inequality is growing. In 1970, the salary of the average CEO was 70 times the wage of the average worker. In 1988, the figure was 191 times. And by 2010, the average American CEO earned 1039 times the wage of the average worker.

According to economist Arthur Okun, the free market system presents a fundamental challenge at achieving both efficiency and equality because of the system of incentives lying at its core.

The contrast among families [in capitalist societies] in living standards and in material wealth reflects a system of rewards and penalties that is intended to encourage effort and channel it into socially productive activity. To the extent that the system succeeds, it generates an efficient economy. But that pursuit of efficiency necessarily creates inequalities. And hence society faces a trade-off between equality and efficiency.

Arthur Okun, *Equality and Efficiency, the Big Trade-off*, 1975

The trade-off between equality and efficiency must be considered when analysing the impact of many macroeconomic policies and the consequences of economic growth.

Inequality exists in the market system. There is no denying this fact. When relative incomes are based on the relative value of the labour provided by different households, it is inevitable that some households will earn higher incomes than others. There will be rich people whose incomes far exceed those whose skill levels and education levels are lower. The inequality that results from the market system is considered by many to be unfair, and evidence that market economies are a failure.

Equality and efficiency are major themes in the IB Economics course. Efficiency means getting the most out of a given input, while equality means smaller disparities among a nation's households in their maintainable living standards and in the distribution of income and wealth.

However, inequality may arise due to the success of the market system at lifting large numbers of people out of the poverty that they may have experienced under a more 'fair' and 'equal' economic system. Even as the gap between the rich and the poor in an economy grows under the market system, the average household can still become richer.

Nonetheless, inequality in the distribution of income may pose several problems for a nation, which is why in the distribution of income is the fourth and final objective of macroeconomic policies. In this chapter you will examine how governments use taxation and government spending to promote a more equitable distribution of income than would otherwise result from a market economy.

Equity refers to fairness in economics, while equality means minimizing the disparities in income and wealth among a nation's households. Equity requires a level playing field on which individuals in society can all have a fair shot at achieving economic success. Equity ultimately promotes greater equality in income distribution.

To learn more about income distribution, visit www.pearsonhotlinks.com, enter the title or ISBN of this book and select weblink 16.1.

Equality *vs* equity

Whereas the market system may fail to promote due to the very system of incentives aimed at encouraging efficiency, is not an unachievable goal for economic policymakers. While no economic policy can ever create equality in a market economy due to the conflict such a policy would create with the aim of efficiency, equity is a slightly different concept in economics. Equity refers to in economics.

What is fair is not necessarily equal. For instance, a taxation system rooted in the idea that those who can afford to pay the highest tax rates should pay the highest tax rates, while those whose incomes are lowest should pay lower rates does not create equality, but it is equitable.

A market system can be equitable even if it cannot create total equality. To a certain extent, a free market economy is in fact more equitable than a command system, in that every individual is free to improve him- or herself through education and professional growth, and then make his or her labour available to the market. In the pursuit of self-interest, however, there are sometimes those who are left behind. In this regard, it is the responsibility of government to promote equity through policies that give every citizen in society a fair shot at achieving economic success in the free market.

Fairness and equity *vs* efficiency and competition. Equity is a difficult concept to define because every individual is likely to have his or her own opinion of what is fair and what is unfair. A market economy is not guided by concepts of fairness and equity, but by the pursuit of profits and self-interest. Therefore, it is up to students of economics to impose on the field their own values in order to create a market system that accounts for more than just the well-being of rich resource owners. The well-being of the lower and middle classes must also be accounted for while protecting property rights and promoting the pursuit of efficiency achieved in a competitive market system.

16.2 Indicators of income equality/inequality

Learning outcomes

- Analyse data on relative income shares of given percentages of the population, including deciles and quintiles.
- Draw a Lorenz curve and explain its significance.
- Explain how the Gini coefficient is derived and interpreted.

Relative income shares

In order to determine the equality or inequality of income distribution across a nation's population, economists first determine how much of a nation's total income is earned by the richest and the poorest groups of households. Table 16.1 divides five nations' households into five quintiles representing the richest 20% of households down to the poorest 20% and then indicates what percentage of total income is earned by each quintile.

TABLE 16.1 INCOME DISTRIBUTION FOR SELECTED DEVELOPING COUNTRIES						
Country	**Percentage of total income earned by:**					**Gini index**
	first quintile (lowest 20%)	**second quintile (next to last 20%)**	**third quintile (middle 20%)**	**fourth quintile next to top 20%)**	**fifth quintile (top 20%)**	
Cambodia	6.5	9.7	12.9	18.9	52.0	43
Indonesia	7.4	11.0	14.9	21.3	45.5	39.4
Brazil	3.0	6.9	11.8	19.6	58.7	56.7
Vietnam	7.1	10.8	15.2	21.6	45.4	37
Turkey	5.4	10.3	15.2	22.0	47.1	41

From Table 16.1 you can see that the highest concentration of income among the top 20% of households exists in Brazil, where the richest fifth of the population earns 58.7% of the income. The poorest fifth of Brazilian households, on the other hand, earn only 3% of the nation's income. Indonesia, another large developing country with a population roughly the size of Brazil's, displays a more even distribution of income; its richest 20% of households account for 45.5% of the income while the poorest earn 7.4%. Both Brazil and Indonesia have large numbers of poor people, but the poorest 20% of people in Brazil are much poorer relative to the richest 20% in Brazil than are the poorest group in Indonesia. Brazil's poor have a much smaller 'slice of the GDP pie' than do Indonesia's poor. Income is distributed less equally in Brazil than in Indonesia.

The Lorenz curve

The Lorenz curve is a graphical representation of a country's income distribution. It plots the cumulative percentage of the nation's income across the cumulative percentage of the population (Figure 16.1). The shape of a country's Lorenz curve tells us much about the country's income distribution.

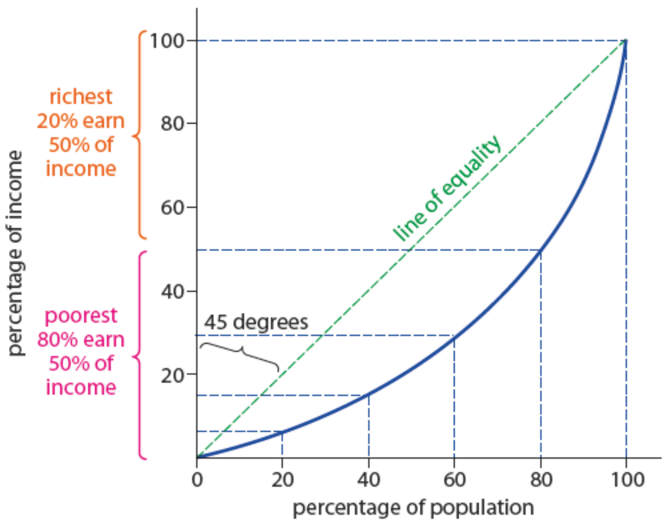


Figure 16.1
The Lorenz curve represents the distribution of income across a nation's population.

The line of equality is the 45-degree line, representing a country in which each quintile (20%) of the population earns exactly the same income as each other quintile. No country has perfectly equal income distribution, therefore the line of equality is only used for comparison. The Lorenz curve in Figure 16.1 represents the data for Cambodia, where the bottom 20% of the population earn 6.5% of the income. On the graph, this is reflected between 0 and 20 on the -axis and 0 and 6.5 on the-axis. The second 20% of Cambodians

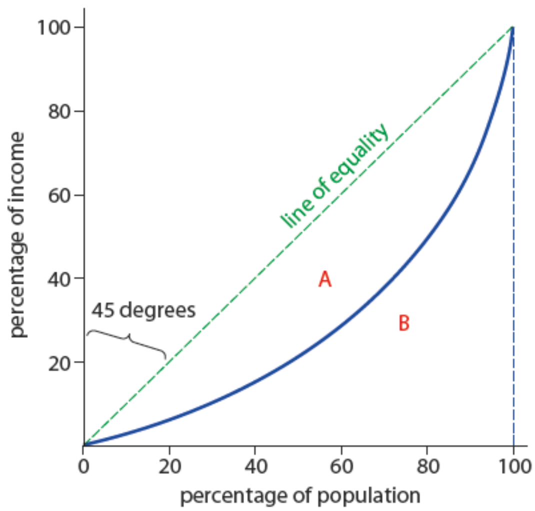
To learn more about the Lorenz curve, visit www.pearsonhotlinks.com, enter the title or ISBN of this book and select weblink 16.2.

earn 9.7% of the income, which is seen between 20 and 40 on the -axis and 6.5 and 16.2 (i.e. 6.5 + 9.7) on the -axis. Finally, the top 20% of income earners in Cambodia account for around 50% of the national income, as can be seen between 80 and 100 on the -axis and 50 and 100 on the -axis.

The Gini coefficient

Rather than draw Lorenz curves for every country to illustrate the level of income inequality, economists use a tool called the Gini coefficient to quantify the degree of income inequality in a nation. The Gini coefficient is the ratio of the area above a country's Lorenz curve and below the line of equality to the total area below the line of equality. In Figure 16.2, the Gini coefficient is the ratio of area A to the area A + B. The further away the Lorenz curve is from the line of equality, the greater the proportion of area A to the total area below the 45-degree line. Therefore, the higher the value of A/(A + B), the greater the Gini coefficient and the more inequality exists in income distribution in the nation. On Cambodia's Lorenz curve, the ratio of area A to area A + B is 0.43, indicating that the area between the line of equality and the Lorenz curve makes up 43% of the total area below the line of equality. Cambodia's Gini coefficient is 0.43.

Figure 16.2
The Gini coefficient measures the ratio of area A to the area A + B. The higher the ratio, the greater the inequality in a country.



The Gini index

The Gini index is an economic indicator of the level of income distribution in a nation. It is expressed as a number between 0 and 100. The closer the index to 100, the greater the disparity between the richest and poorest households in a nation. The closer to zero, the more equally income is distributed across the nation's households.

Economists more commonly refer to the Gini index. This is the Gini coefficient multiplied by 100. A Gini index of 100 would indicate perfect inequality of income distribution in the nation. The top 1% of the population earns 100% of the income. This represents an extreme example and is not technically possible, since even in a nation in which poverty is extremely widespread the large number of poor require some income just to survive.

On the other extreme, a Gini index of zero would indicate perfect equality of income distribution. The Lorenz curve would lie along the line of equality, meaning every household in the nation would enjoy an identical share of the national income. There would be neither rich nor poor citizens since everyone's income would be the same. Just as a Gini index of 100 is impossible, so is an index of zero. Even in the world's communist countries of the Soviet bloc and Asia during the mid-20th century there existed a rich elite whose share of the national income was larger than others. This was because of their control of essential resources or political connections or corruption.

Today, the countries with the highest Gini index are mostly sub-Saharan African nations and other extremely poor developing countries. The existence of a small group of extremely rich people and a large majority of extremely poor people makes for a high Gini index and vast income inequalities. The nations with the lowest Gini indexes and the greatest equality in income distribution are mainly Northern and Western European countries in which the government plays an active role in the redistribution of income through taxes and government spending. Figure 16.3 shows the Lorenz curve and the Gini indexes for four major world economies.

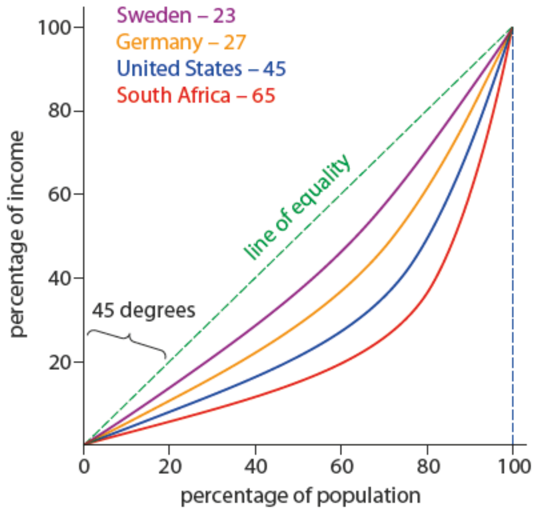


Figure 16.3
The Lorenz curves for a selection of countries, some more equal than others.

The notion of fairness can be approached from a number of perspectives – equality of opportunity, maximizing the income of the least well-off group, and absolute equality of income.

- Which of these notions seems to be most attractive? Why?
- Examine what each of these perspectives suggests is a fair distribution of income.

Sweden has the world's most equal distribution of income, while South Africa is among the world's most unequal countries. The US falls right in the middle of the 130 countries for which data exists, with a Gini index roughly equal to that of Cambodia. It should be emphasized that the Gini index and Lorenz curve do not tell us anything about the of a nation, only the of people within the nation. America's poorest 20% earn far less than its richest 20%, but they are still much richer than even the richest 20% in Cambodia. Many of the richest countries in the world have highly unequal income distribution, with Gini indexes as high or higher than many of the world's poorest countries. Some examples include:

- Hong Kong, Gini index = 53.3; Honduras, Gini index = 53.3
- Singapore, Gini index = 48.1; Ecuador, Gini index = 47.9
- USA, Gini index = 45; Cameroon, Gini index = 44.6
- Japan, Gini index = 38.1; Guinea, Gini index = 38.1

Each of the countries on the left is considered a high-income country, those on the right are extremely poor countries; yet they are roughly identical when it comes to equality of income distribution.

Figure 16.4 (overleaf) shows a selection of national Gini indexes, from the world's most equal (Sweden) to the least equal (Namibia).

Figure 16.5 (overleaf) shows the Gini coefficients for the 130 countries for which data is available.

Figure 16.4
The most and least equal income distributions.

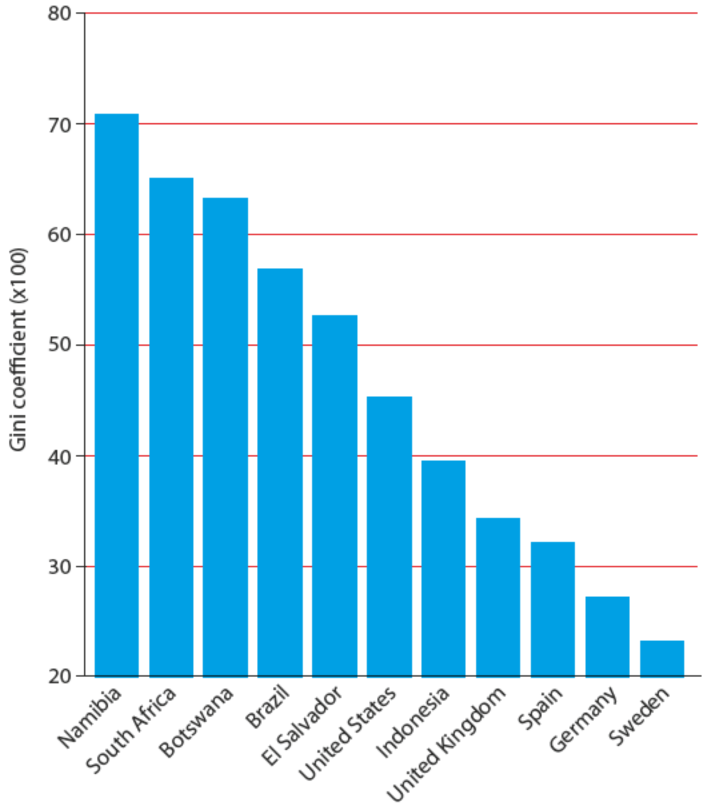
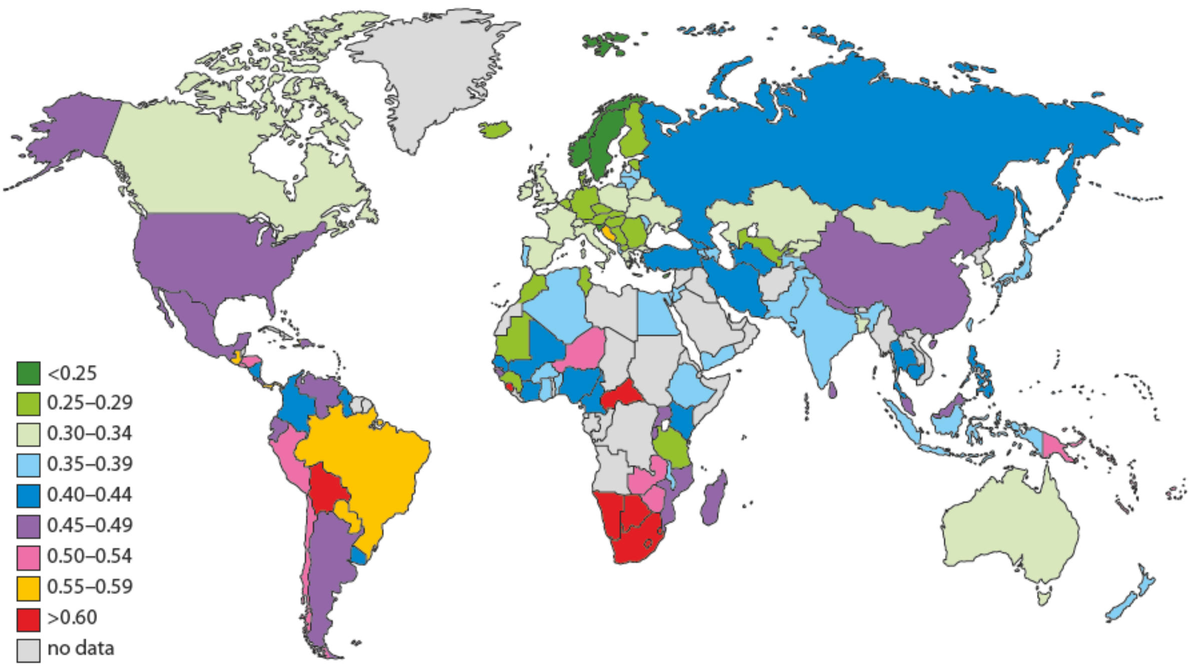


Figure 16.5
Gini coefficients worldwide.
World CIA Report, 2009



EXERCISES

1. Study Figure 16.5. Generally speaking, are there regions of the world in which income inequality is greater than other regions? What regions appear to have the most equal distribution of income? The least?
2. Why do you think certain countries have more equal income distribution than others?
3. Are rich countries necessarily more equal than poor countries?

16.3 Indicators of poverty

Learning outcomes

- Distinguish between absolute poverty and relative poverty.
- Explain possible causes of poverty, including low incomes, unemployment and lack of human capital.
- Explain possible consequences of poverty, including low living standards, and lack of access to healthcare and education.

What does it mean to be poor? Despite the popular belief that there are rich countries and poor countries, in reality there is poverty in every country in the world. There are also incredibly rich people even in the world's poorest countries. So it is an over-simplification to say that one country is rich while another is poor. Poverty exists everywhere; but in higher-income countries, the poverty is typically while in the poorest countries, we are looking at .

Relative *vs* absolute poverty

Relative poverty is the condition experienced by people in a country whose incomes are considerably lower than the higher income groups in the same country. To be considered poor in America, for instance, an individual must earn less than $10 830 per year, or a family of four must live on less than $22 050 per year. In India, on the other hand, a person living in a city is considered poor if he or she earns less than 500 rupees per month, which equates to roughly $140 per year. An individual with an annual income of $10 000 lives in poverty in America, but would be among the richest 20% of Indians, while an Indian earning $1000 a year is among the middle class in India but would be likely to starve to death in the US.

Relative poverty exists even in the world's richest countries, but absolute poverty is, for the most part, limited to the world's poorest countries with the lowest incomes. To be relatively poor in a country where the average income is already very low may mean you live in absolute poverty.

Absolute poverty is the condition experienced by individuals who cannot afford to acquire the basic necessities for a healthy and safe existence. Such necessities are sanitation, shelter, clean water, nutrition and healthcare. Absolute poverty does not exist everywhere; it is primarily concentrated across the 60 poorest countries of the world – among the people whom Cambridge economist Paul Collier calls the 'bottom billion'.

If the average income of a nation rises and the income distribution remains the same, the level of relative poverty will stay the same, while the number of people in absolute poverty will decrease. It is important to keep this distinction in mind as we examine the efforts of policymakers to eradicate poverty. While absolute poverty may be reduced through international economic development strategies (Chapters 26–29), relative poverty persists and could lead to macroeconomic instability unless policies aimed at redistributing the nation's income are enacted on a national level.

Definitions of poverty vary between nations (and even individuals). To what extent does the definition of poverty we use dictate how we view poverty in the world around us?

Possible causes of poverty

The definition of poverty is a topic of debate among economists, politicians, sociologists, historians, the media, and pretty much anyone else who is asked to define it. It is not an exaggeration, however, that regardless of each person's definition, around half of the world's population lives in either relative or absolute poverty. A mainstream view is that approximately 1 billion people, or around 15% of the world's population, live in absolute poverty, subsisting on less than $2 per day.

The causes of poverty are myriad and warrant a whole book to themselves. In Chapters 26–29, the causes and consequences of poverty are explored in detail. In the meantime, here are some of the obvious causes of poverty that people in all countries, rich and poor, must deal with.

- **Low income**. By the most basic definition, means 'being poor'. Households with low incomes are more likely to live in poverty than those with high incomes, because they cannot afford to buy the necessities required to maintain a healthy, comfortable standard of living.
- **Unemployment.** The lack of a job reduces a household's ability to meet its material needs and wants. A country with high rates of unemployment will experience greater poverty than one with low unemployment, unless that country has a well-funded, reliable set of social safety nets that provide public support to individuals who have lost their jobs.
- **Lack of human capital**. The ultimate cause of poverty is lack of human capital among individuals in society. Without education, skills, and access to healthcare, individuals will be less productive; they will produce and consume at a reduced level of income.

CASE STUDY

Wealth gap in China continues to widen

The gap between the rich and poor in China continues to widen as labourer wages make up a lesser proportion of gross domestic product (GDP), an official at the country's only umbrella union said Wednesday.

Zhang Jianguo, an official at the All-China Federation of Trade Unions (ACFTU) claimed that worker wages accounted for just 36.7 percent of China's GDP in 2005, down sharply from 56.5 percent in 1983.

'It is urgent to reform the current income distribution system in China. The key is to raise the wages of workers,' Zhang said in an interview with Beijing-based daily Xinjingbao, South Korea's Yonhap news agency reported Wednesday.

The ACFTU is the sole national trade union federation in China and the largest trade union in the world with 134 million members.

Zhang said the steady rise in the gap between rich and poor has caused labour-management disputes.

Su Hainan, director of the Institute for Labour and Wages Studies of the Ministry of Human Resources and Social Security, expressed a similar view, noting that the income of urban residents is 3.3 times that of people in the countryside.

'Senior managers at listed state-owned enterprises receive incomes that are 18 times higher than those of their employees,' Su said.

'On average, a senior manager's income is 128 times higher than the average wage in the whole country.'

According to the most recent World Bank figures, China's Gini index comes to 47 – considered an 'alarming' level.

Malaysian National News Agency (Bernama), 12 May 2010

In 2010, China experienced a wave of large-scale public strikes in the electronics and auto industries. After a string of suicides committed by workers at a Foxconn factory in Shenzen, China's workers became emboldened. Their strikes are symptomatic of major worker unrest as income gaps continue to widen in China.

EXERCISES

4 Based on information in the above news article, what has most likely happened to China's Gini index between 1983 and 2010? Justify your answer.

5 Why should the increasing gap between the rich and the poor in China be a concern to the Chinese government?

6 Identify the reasons that may explain why 'the income of urban residents is 3.3 times that of people in the countryside.'

Consequences of poverty

Inequality in the distribution of income is an inevitable result of an economic system that rewards the households with the highest skills, best education and most access to capital with higher wages and incomes in the marketplace.

Poverty, both relative and absolute, poses several obstacles to improvements in well-being for a nation's people. Social unrest among the poorest members of society can lead to political and economic instability for a nation as a whole. The hardships experienced by society's poorest members are ultimately felt by the rest of society because the needs of the poor must be met in one way or another and, in extreme circumstances, may lead to a violent struggle between economic classes.

The existence of absolute poverty is a major problem for a nation. Those who experience it are unlikely to contribute to national output and economic growth because of their low levels of health, education and productivity.

Without promoting some degree of equity in the distribution of income, governments run the risk of undermining their accomplishment of other social and economic objectives. So how do governments achieve more equal income distribution? Before we look at the modern mechanisms by which this objective is achieved, it is important to examine the historical ideology that frames modern economic policy.

16.4 The role of taxation in income distribution

Learning outcomes

- Distinguish between direct and indirect taxes, providing examples of each, and explain that direct taxes may be used as a mechanism to redistribute income.
- Distinguish between progressive, regressive and proportional taxation, providing examples of each.
- (HL only) Calculate the marginal rate of tax and the average rate of tax from a set of data.

For centuries the role of government has been debated among economists. The extent to which it is the government's job to ensure equity in the distribution of income has never been fully agreed on by policymakers; opinions differ depending on the school of economic ideology to which they subscribe.

The Marxist view (in decline since the collapse of the USSR and China's adoption of state capitalism) enjoyed a brief resurgence with the onset of the 2008 financial crisis, as events seemed to match Marxist ideology. In the wake of the crisis, the highest income earners in many countries have grown richer as they bought up cheap resources and property, while the rest appeared to grow poorer, a dynamic Marx described as endemic to capitalism.

The Marxist view

On the far left of the economic spectrum is Marxist/socialist ideology, which believes that households' money incomes should be made obsolete and each household's level of consumption should instead be based on the use-value of the output which it produces. In a purely Marxist/socialist economy, money incomes do not matter since the output of the nation will be shared equally among all those who contribute to its production. Private ownership of resources and the output those resources produce are wholly abolished in a socialist economy. The ownership and allocation of resources, goods and services are in the hands of the state. Production and consumption are undertaken based on the principle of equality.

The slogan 'from each according to his ability, to each according to his need', made popular by Karl Marx, summarized the view that a household's consumption should be based on its level of need, rather than the amount of capital it owns and the income it can earn from that capital. The logical conclusion of this idea is that all households in a nation have essentially the same basic needs, therefore household incomes and consumption should be equal across the nation.

The *laissez-faire* view

On the other extreme of the economic spectrum is the , free market model which argues that the only role the government should play in the market economy is in the protection of private property rights, ensuring that the private owners of resources are able to pursue their own self-interest in an unregulated marketplace where their money incomes are determined by the exchange-value of the resources they own, including capital, land and labour.

In a market economy, the level of income and consumption of households vary greatly across society because the exchange-value of the resources owned by households is what determines income, not the principle of equality, which drives a socialist economy. Each individual in society is free to pursue his monetary objectives through the improvement of his human capital and the accumulation of physical capital and land and the resulting increase in exchange-value in the resource market.

The modern, mixed economy

In today's world, there exists neither a purely socialist economy nor a purely free market economy. In reality, all modern economies are mixed economies in which governments do much more than simply protect property rights, but do not go so far as to own and allocate all factors of production. The role of government in the distribution of income in today's economies is relegated to the collection of taxes and the provision of public goods and services and transfer payments.

The role of government: taxes

A tax is simply a fee charged by a government on a person's income, property or consumption of goods and services. Taxes can be divided into two main categories: direct and indirect.

Direct taxes

These are taxes paid directly to the government by those on whom they are imposed. An income tax is a direct tax because it is taken directly out of a worker's earned income. Corporate and business taxes are also direct taxes based on the revenues or profits of firms.

Direct taxes cannot be legally avoided since they are based on the earned income of each individual. The burden of direct taxes is borne entirely by the households or firms paying them.

Direct taxes are taxes paid directly to the government by those on whom they are imposed.

Indirect taxes

These are the taxes paid by households through an intermediary such as a retail store. The consumer pays the tax at the time of his purchase of a good or service and the amount of the tax is usually calculated by adding a percentage rate to the price of the item being purchased.

Indirect taxes are paid by households through an intermediary such as a retail store. The intermediary then pays the government.

Indirect taxes include sales taxes, value added taxes (VAT), goods and services tax (GST) as well as taxes (excise taxes) which are placed on specific goods such as cigarettes, alcohol or petrol. Indirect taxes can be avoided simply by not consuming certain products or by consuming less of all products. The burden of indirect taxes is borne by both households and firms, the proportion borne by each is determined by the price elasticities of demand and supply (Chapter 4).

Different taxes result in different burdens

Taxes can be proportional, regressive or progressive in nature. This means that different taxes place different burdens on the rich and the poor.

Proportional tax

A tax for which the percentage remains constant as income increases is a proportional tax. The rich will pay more tax than the poor in absolute terms, but the burden of the tax will be no greater on the rich than it is on the poor.

A household earning 20 000 euros may pay 10% tax to the government, totalling 2000 euros. A rich household in the same country pays 10% on its income of 200 000 euros, totalling 20 000 euros in taxes. There is a difference in total value but the proportional burden is the same on the rich household as it is on the poor household.

Proportional taxes are uncommon in advanced economies, although some payroll taxes (i.e. those collected to support social security or welfare programmes) are based on a percentage of employees' incomes up to a certain level. For instance, the US social security tax is 6.2% of gross income up to $108 000. Regardless of a person's income below $108 000, he or she will pay 6.2% to the government to support the country's social security programme.

Regressive tax

A tax that decreases in percentage as income increases is said to be regressive. Such a tax places a larger burden on lower income households than it does on higher income earners since a greater percentage of a poor household's income is used to pay the tax than a rich household's.

You may be wondering why a government would ever levy a tax that harms the poor more than it does the rich, but in fact almost every national government uses regressive taxes to raise a significant portion of its tax revenues. Most indirect taxes are actually regressive, which may not make sense at first, since a sales tax is a percentage of the price of products consumed. The regressiveness becomes apparent when the amount of the tax is compared to the income of the consumer.

State and national lotteries are often criticized as regressive taxes. Putting aside the voluntary aspect of lottery playing, is the effect regressive? Economist Emily Oster examined lottery sales by postal code; her study suggests that when jackpots are low, the poor bought a larger share of tickets. But when the jackpot grows, high-income groups buy more.

To demonstrate how a sales tax is regressive, imagine three different consumers who purchase an identical laptop computer for €1000 in a country with a value added tax of 10% added to the price of the computer (Table 16.2).

TABLE 16.2 INDIRECT TAXES ARE REGRESSIVE BECAUSE THE TAX PAID IS A SMALLER PROPORTION OF THE INCOME OF A RICH PERSON THAN THE INCOME OF A POOR PERSON

Income of buyer/€	Amount of tax paid/€	% of income taxed
10000	100	1
50000	100	0.2
100000	100	0.1

Are lotteries a tax at all? Would your answer change if we learned more about human behaviour patterns from economics and psychology?

The higher-income consumer pays the same amount of tax as the lower-income consumer, but the tax makes up a smaller percentage of the former's income than it does of the latter's. Although they appear to be equitable since everyone pays the same percentage of the price of the goods they consume, indirect taxes such as VAT, GST and sales taxes are in fact regressive taxes, placing a larger burden on those whose ability to pay is lower and a smaller burden on the higher-income earners whose ability to pay is greater.

Progressive tax

Is a progressive tax the most equitable way of taxing income? Summarize your belief in a few sentences. On what manner of knowing (the senses, reason, emotion, language) do you base your belief? Would you change your answer if you were talking with someone with a very different income level? How?

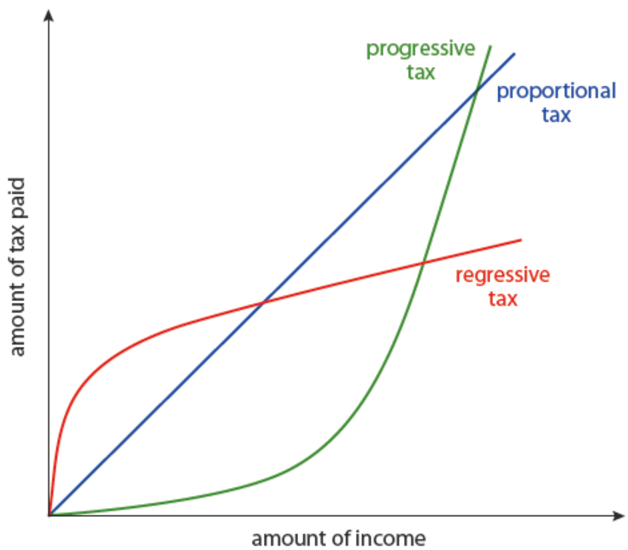
This is a tax for which the percentage paid in tax increases as income increases. The principle underlying a progressive tax is that those with the ability to pay the most tax (the rich) should bear a larger burden of the nation's total tax receipts than those whose ability to pay is less. In this way, a progressive tax is the most equitable of the three types of taxes a government collects.

Lower-income households not only pay less tax, but they pay a smaller percentage of their income in tax as well. Most nations' income tax systems are progressive, the most progressive being those in the Northern European countries which, not surprisingly, also demonstrate the most equal distributions of income. Of the various types of taxes, a progressive income tax aligns most with the macroeconomic objective of equity in the distribution of income.

Comparing income tax systems

Figure 16.6 shows the relationship between an individual's income and the amount of tax the individual will pay under each of the three tax systems. Assuming a proportional tax,

Figure 16.6
The amount of tax paid relative to income under progressive, regressive and proportional taxes.



for instance, each household will pay an identical proportion of its income in tax, so as income rises, the amount of tax paid rises at a constant rate.

Under a regressive system, on the other hand, lower-income households pay a larger percentage of their income in taxes. Regressive taxes are mostly indirect, consumption taxes, so higher-income households still pay more in tax (since they consume more), but the amount paid increases at a decreasing rate because at higher incomes the marginal propensity to consume becomes less and more income goes towards savings instead (thus left untaxed).

A progressive tax places very little burden on low income households, since under most progressive income tax systems, the lowest income earners actually pay no tax at all. At higher-income levels, a greater percentage of income is paid as tax, so the amount paid increases at an increasing rate as household income rises. The highest income earners in the economy pay the most tax in all three systems. However, only under a progressive tax system do the richest households also bear the greatest tax burden, meaning that they pay a higher proportion of their income in taxes than lower-income households.

A regressive tax is one in which the percentage decreases as the taxpayer's income rises. Lower-income earners pay a larger percentage of their income in tax than higher-income earners.

A proportional tax is one in which the proportion of income paid in tax is constant at all income levels. A low-income household pays the same percentage in tax as a higher-income household.

A progressive tax is the most equitable of the three types of tax, because it places the largest burden on high-income earners. The percentage paid in tax increases as income rises, allowing for those with the greatest ability to pay to pay the greatest proportion of a nation's tax.

Arguments for a progressive income tax

The main argument against progressive income taxes is that taxing higher incomes at higher rates creates a disincentive to work, in effect punishing any increase in productivity or effort among the nation's workers. However, the fact that higher rates only apply to marginal income, rather than total income, ensures that a worker's after-tax income is always an increasing function of gross income. Therefore, there is always an incentive to increase income by working harder, longer, or more efficiently because the increase in taxes will always be less than the increase in income.

A progressive income tax system provides governments with an effective means of re-distributing the nation's income because those with the greatest ability to pay (the rich) provide the nation with far more of its tax revenue than those with the least ability to pay (the poor). Figure 16.7 shows the total amount of tax revenue generated by each of the five quintiles of income earners in the US in 2006. While the lowest 20% of income earners accounted for around 1% of total tax receipts, the top quintile contributed nearly 70% to America's tax revenues.

In other Western economies, progressive income taxes typically account for the largest proportion of total tax receipts by the government. Canada has an even higher top marginal tax rate than the US and, rather than applying to people earning above $370 000, as it does in the US, Canada's top tax rate kicks in for workers earning just $100 000 per year. In Canada, personal income taxes account for around 50% of total federal tax

To access Worksheet 16.1 on tax progressivity, please visit www.pearsonbacconline.com and follow the onscreen instructions.

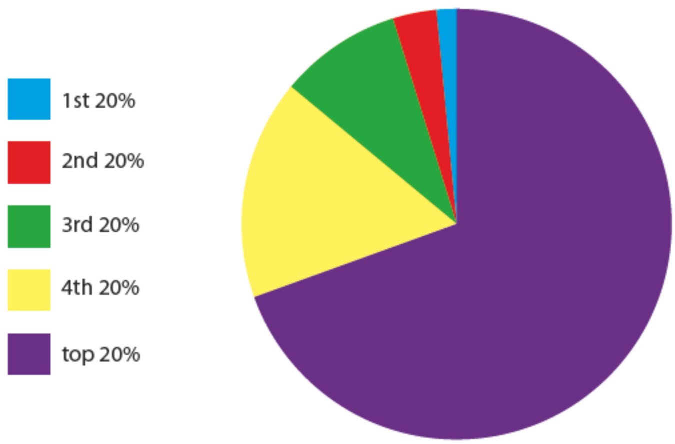
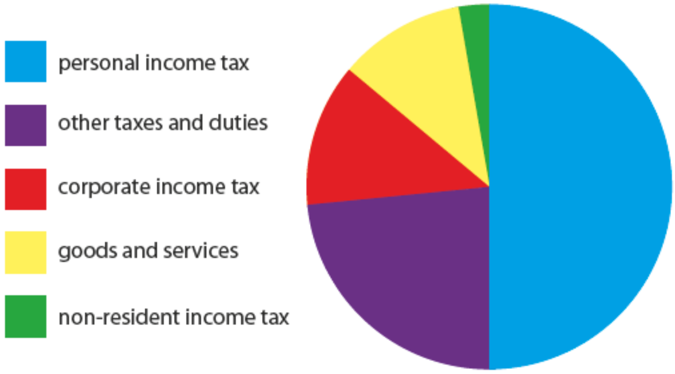


Figure 16.7 Progressive income tax burden.

Figure 16.8
Sources of Canada's tax revenues.



revenues, while the corporate tax and the national goods and services tax make up the next largest portions (Figure 16.8, above).

The highest marginal tax rates tend to exist in the social democratic nations of Northern and Western Europe (Figures 16.9 and 16.10). Denmark, a country with a Gini index of 29, has the highest tax rate on top income earners. More significant than the high rate, however, is the fact that it kicks in at such a low income level, around $50 000 per year. This means that a large number of Danish workers are paying a high marginal and average tax rate. The burden of the income tax in Denmark is not just borne by the rich, but by the middle class

Figure 16.9
Marginal tax rates in OECD countries.

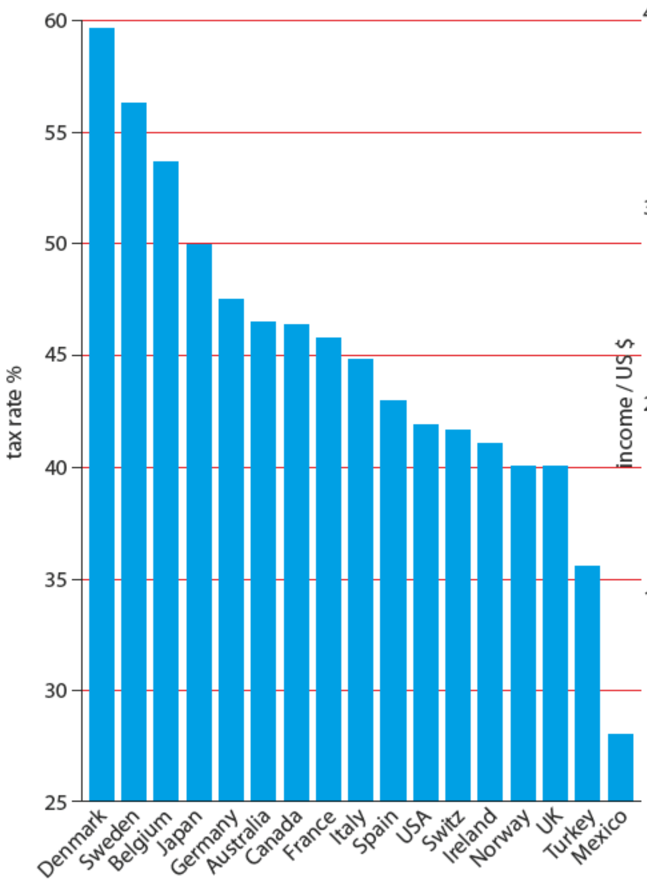
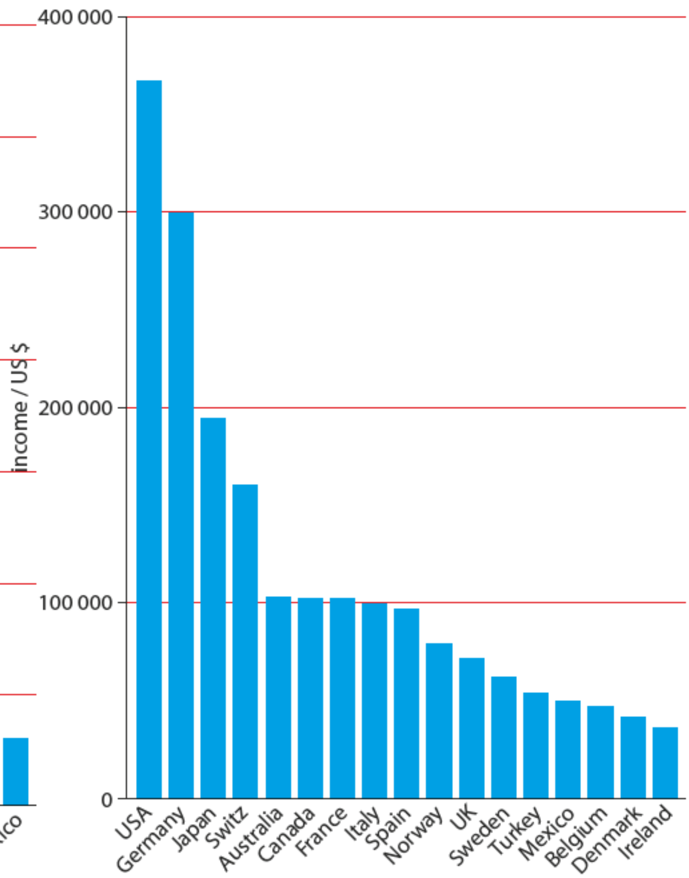


Figure 16.10
Income levels at which highest marginal tax rate applies.



as well. In contrast, Germany's top marginal tax rate of 47% is reached only when a worker's gross income exceeds $300 000 per year, meaning the income tax burden in Germany is borne more by the rich than those earning lower incomes, as is the case in the US.

The effects of a progressive tax on income distribution

Referring to the Lorenz curve model for showing the distribution of a nation's income, it can be argued that the more progressive a nation's income tax, the closer the Lorenz curve is to the line of equality. It is no coincidence that some of the countries with the lowest Gini indexes (Sweden, Germany, Belgium) also have some of the highest marginal tax rates in the world, while those with the lowest marginal tax rates (Mexico, Turkey) have a higher Gini index and a Lorenz curve further from the line of equality (Figure 16.11).

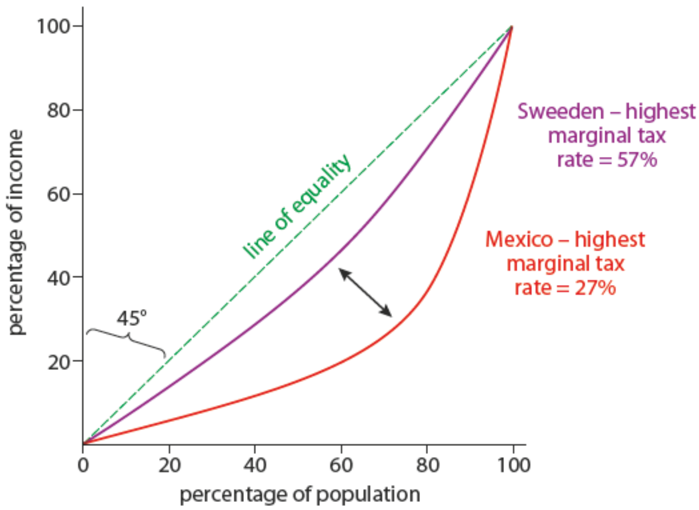


Figure 16.11
A more progressive income tax typically corresponds with more equal income distribution.

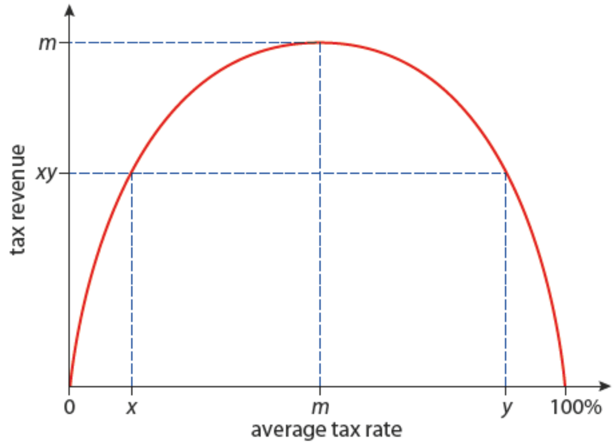
Taxes collected from higher-income earners in a high marginal tax country like Sweden are used to provide goods, services and transfer payments to those whose incomes would otherwise be much lower. The equity of such a progressive tax system is derived from the fairness behind making rich households bear a larger burden of the nation's tax system. Equity in the tax system leads to greater equality in the income distribution, as seen in the two Lorenz curves for Sweden and Mexico.

Arguments against progressive income taxes

The primary argument against the use of progressive income taxes as a means to redistribute national income comes from the supply-side school of macroeconomic thought. Supply-siders, whose views are formed by the classical theory of macroeconomics, base their perspective on the belief that a free market economy without government interference always maximizes a country's efficiency, production, and standard of living. They therefore believe that there is a certain level of taxation at which a nation's total tax receipts are maximized. Beyond this point, further increases in the tax rate are believed to lead to a decline in the amount of taxable income due to the disincentive created by the higher tax rate. The Laffer curve demonstrates the relationship between tax rate and tax revenue graphically (Figure 16.12, overleaf).

At a tax rate of 0%, households and firms keep 100% of their gross income and there is no tax revenue for the government. However, at a tax rate of 100%, there is also no tax revenue since no rational individual would choose to work if the government were to take everything he or she earned. The supply of labour falls as the tax rate increases because fewer individuals are willing to work as the government collects higher and

Figure 16.12
The Laffer curve shows the hypothetical relationship between the tax rate in a country and the amount of tax revenue generated.



higher percentages of their earned income. Therefore, there would be no income for the government to tax at a tax rate of 100%.

Since tax rates of both 0% and 100% create zero tax revenue, the Laffer curve theory holds that at some tax rate () in between 0% and 100% the government's total tax receipts are maximized. The Laffer curve is often cited by supply-side advocates as an argument for reducing marginal income tax rates on the top income earners. If, for instance, the tax rate is at , it is possible that a lower tax rate could lead to higher tax revenue if the falling taxes incentivize individuals to join the labour force and existing workers to work harder and longer hours, creating more taxable income. In addition, entrepreneurs may be more inclined to start businesses and firms to increase their investments in physical and human capital, both activities contributing further to increases in national output and taxable income. At lower tax rates, argue the supply-siders, the level of taxable income may increase leading to higher tax revenues for the government.

It is not clear from the Laffer curve at what precise level of taxation tax revenues are maximized. The model is most commonly employed by supply-siders to justify their desire for lower income and corporate taxes and a general reduction in the interference of the government in the functioning of the free market. The supply-side argument holds that lower taxes lead to an increase in the supply of labour and capital as households and firms are incentivized to become more economically active, leading to increases in the nation's aggregate supply (AS) and thereby promoting the accomplishment of the macroeconomic goals of full employment and economic growth.

To access Worksheet 16.2 on tax choices, please visit www.pearsonbacconline.com and follow the onscreen instructions.

To learn more about taxes, visit www.pearsonhotlinks.com, enter the title or ISBN of this book and select weblink 16.3.

To learn more about the Laffer curve, visit www.pearsonhotlinks.com, enter the title or ISBN of this book and select weblink 16.4.

EXERCISES

7 The table below shows tax rates calculating marginal and average rates of taxation in France (2010).

FRANCE'S MARGINAL TAX RATES

Marginal income brackets/€	Marginal rate of taxation/%	Worker's gross income/€	Tax paid/€	Average rate of taxation/%
0–6 000	0	5 000	0	0
6 000–12 000	5.5	10 000	–	–
12 001–26 000	14.0	20 000	1 450	7.25
26 001–70 000	30.0	50 000	–	19.0
70 000+	40.0	100 000	27 490	–

a Calculate the total amount of tax paid by a French worker earning €10 000 per year.

b Calculate the average rate of taxation the same worker pays. Which is greater, the marginal rate of taxation or the average rate of taxation? Explain.

c What does a French worker earning €50 000 pay in taxes?

d Calculate the average rate of taxation for a French worker earning €100 000 per year.

Calculate marginal rate and average rate of tax (HL only)

A progressive income tax typically consists of a marginal tax bracket in which the increasing tax rates apply to marginal income, rather than to total income. In such a system, the average tax a household pays increases less rapidly than the marginal tax because the higher marginal rate only applies to additional income beyond the upper range of the previous bracket. In other words, each successively higher tax rate is only charged on the income in excess of that already taxed at the previous level. Table 16.3 shows the marginal tax rates in the US in 2009. The third column shows the cumulative tax rate paid when tax on all the income in a given bracket has been calculated.

TABLE 16.3 US MARGINAL TAX RATES, 2009

Income range/$	Marginal tax rate/%	Tax paid by someone at top of bracket/$	Average tax rate/%
0–8 375	10	837.50	10.00
8 376–34 000	15	4 681.25	13.77
34 001–82 400	25	16 781.25	20.37
82 401–171 850	28	41 827.25	24.34
171 851–373 650	33	108 421.25	29.02
373 851–500 000 (and above)	35	152 643.75 (on 500 000)	30.53

An American worker earning $8000, for instance, will pay $800 in income tax. But if his income increases to $10 000 he will pay 15% of the full $10 000 ($1 500). He will pay 15% on the income earned above $8375. Such a worker would therefore pay 10% of his first $8375 ($837.50) plus 15% on the additional $1625 he earned, which is another $243.75.

The marginal rate of taxation (MRT) is the change in tax (Δ) divided by the change in gross income (Δ_G). His total tax would therefore equal $1081.25.

$$\text{MRT} = \frac{\Delta t}{\Delta Y_G}$$

The average rate of taxation (ART) at a particular level of income is found by dividing the amount of tax paid by the individual's gross income (Y_G).

$$\text{ART} = \frac{\text{tax}}{Y_G}$$

For workers in each of the income brackets above, the average rate of taxation is always lower than the marginal rate of taxation, since tax increases only apply to additional income earned beyond the previous bracket.

HL EXERCISES

8 The following table shows annual income and marginal income tax rates for a country.

Annual income/$	Marginal income tax rate/%
0–20 000	15
20 001–50 000	25
50 001–100 000	40
100 000+	50

Calculate the annual tax paid by individuals earning

a $40 000

b $80 000

c $120 000

9 Calculate the average tax rate for each of the individuals above.

10 In the same country, the indirect tax (the tax on consumption) is set at 20%.

a If individual **a** above spends $50 000 a year, how much of this is indirect tax?

b Assume individual **c** spends $60 000 a year. How much of this is indirect tax?

11 Which system is more effective at redistributing the nation's income from high-income earners to low-income earners: the direct tax based on the marginal rates above or an indirect tax of 20%. Explain your answer.

16.5 Other measures to promote equality

Learning outcomes

- Explain that governments undertake expenditures to provide directly or to subsidize a variety of socially desirable goods and services (including healthcare services, education, and infrastructure that includes sanitation and clean water supplies), thereby making them available to those on low incomes.
- Explain the term transfer payments, and provide examples, including old age pensions, unemployment benefits and child allowances.

Collecting money from the private sector through direct and indirect taxation is only half of the task undertaken by a government in its efforts to achieve a more equitable distribution of income in the nation. The next step is the redistribution of the tax revenues collected through government expenditures on public goods and services and transfer payments.

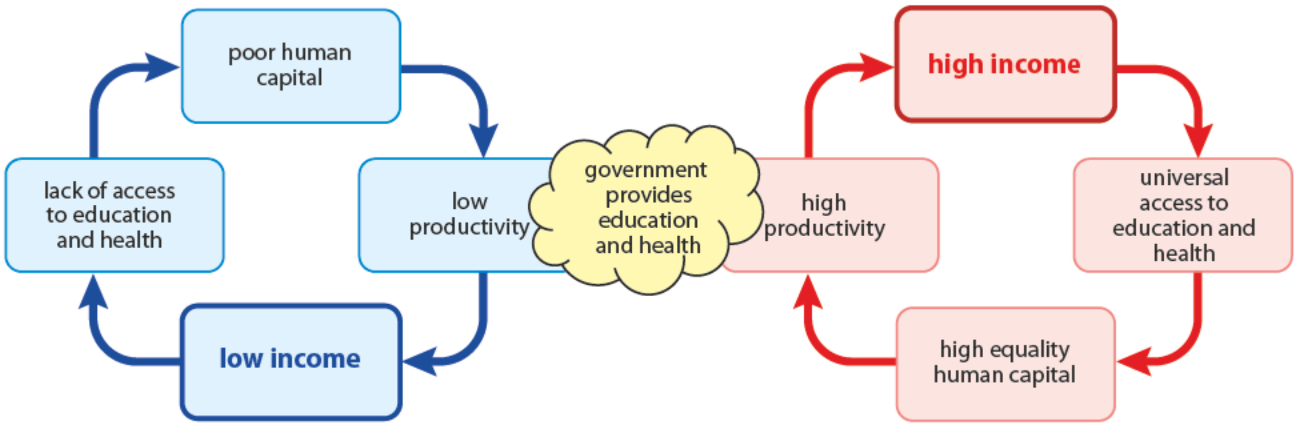
The lower the income a household earns, the less its ability to enjoy a good quality of life. Not only will the luxuries enjoyed by the rich be out of reach of low-income households, but many of the necessities required for a healthy and safe existence may also be beyond the means of the lowest income earners, even in rich countries like the US, Australia or Germany. To avoid the vast disparities in standards of living that result from the unfettered workings of a market economy, governments use revenues from direct and indirect taxes to provide public goods and services to the nation's people and to redistribute the nation's income from the rich to the poor through transfer payments, such as welfare, social security and subsidies to the poor.

Role of government: provision of public goods

As you learned in Chapter 5, public goods are those items consumed by households that produce spillover benefits for society as a whole, yet they are often not provided by the free market because of their non-rivalrous nature. Goods such as education and health insurance are provided by private firms that are able to charge high tuition fees and high insurance premiums to those who are willing and able to pay for these services in the marketplace. But for many households, education and health insurance are viewed as optional expenditures that are less important than straightforward material needs such as food and shelter. A poor household, even in a rich country, is less likely to receive adequate education and healthcare if the provision of these necessities were left entirely to the free market, whereas the rich would find these services affordable and would be likely to consume them to a much greater extent.

The gap in consumption of education and healthcare between the rich and poor in a market economy leads to a poverty cycle and the perpetuation of the income gap. Poor households find it harder and harder to escape poverty due to their low levels of human capital. Upper-income households, on the other hand, have a competitive advantage in the marketplace, not due to their innate intelligence or skills, but due to the fact that they can afford better and more education and healthcare in the marketplace. By providing universal education and healthcare to all members of society, a government can help the poor escape poverty (Figure 16.13).

Figure 16.13
The poverty cycle can be turned into a prosperity cycle through government provision of public goods.



The provision of public education and public healthcare should, therefore, be of the utmost priority to a national government that wishes to reduce income inequality within the nation. Educating the poor increases the likelihood that they will escape poverty without infringing on the prosperity of the rich. Better access to healthcare also increases the chance that a low-income household will become more productive and achieve higher incomes in the future.

The provision of public goods benefits low-income earners but also leads to gains for society as a whole. High-income earners are often the business owners or managers in an economy, whose businesses will find it easier to hire highly skilled, better educated, healthier and more productive workers in a nation with national healthcare and public education. While the provision of these goods requires the collection of taxes from the private sector, which could have negative effects on aggregate supply in the nation, it also makes for a more productive workforce, which could have positive effects on aggregate supply.

Role of government: transfer payments

A transfer payment is a payment from the government to an individual for which no good or service is exchanged. Income is redistributed from one group to another.

Another means by which government redistributes the nation's income is through the provision of transfer payments from high-income groups to low-income groups. A transfer payment is a payment from the government to an individual for which no good or service is exchanged. Transfer payments come in many forms, but one characteristic of all transfer payments is that in order to be eligible to receive them, an individual has to fall below a certain income threshold or to be experiencing economic hardship.

Transfer payments are not counted in the GDP of a nation because they are considered non-production transactions; income is transferred from one group (higher-income earners) to another group (lower-income earners) but no new income or output results from the transaction.

Transfer payments existing in most developed countries include:

- unemployment benefits
- social security benefits
- nutritional subsidies
- higher education grants and tuition subsidies
- welfare benefits.

Unemployment benefits

Where is the best place to lose your job? Scandinavian countries offer unemployment payments that add up to 80% of your previous income, for a time period of 10 months up to four years.

When a worker loses his or her job and is unable to find a new one, he or she may become eligible for unemployment compensation. The level of compensation and the length of time over which it can be collected vary from country to country. The intention of such benefits is to allow the unemployed worker to maintain during his period of unemployment a standard of living somewhat equal to that which he enjoyed before losing his job. Such benefits also help keep aggregate demand afloat during a time of recession and rising unemployment, because they prevent the disposable income and consumption of households from declining too much and thereby help offset the fall in total spending in the economy.

Social security benefits

Social security benefits include retirement income and disability income for workers in a nation. Income is redistributed from current workers through their income or payroll taxes to currently retired individuals or those who are unable to work due to a disability. In many countries, social security taxes are collected separately from the normal income tax, and apply up to a limit determined by the government. In the US, a social security tax of 6.2% is deducted from workers' income up to \$108 000. A further 6.2% must be contributed to social security by the employer. Income beyond \$108 000 is not taxed. Social security is a transfer payment funded by a proportional tax on income up to a certain threshold, beyond which the tax becomes regressive since very high-income earners end up paying a smaller percentage of their total income to social security.

Nutritional subsidies

Low-income households often lack access to healthy food, a reality which leads to higher rates of diabetes, malnutrition, obesity and other food-related illnesses. This subsequently makes low-income households less productive members of the workforce and contributes to their continued poverty. Subsidized nutrition is a form of transfer payment by which low-income households receive coupons from the government to be used to purchase certain nutritional food items. This lowers the burden on poor households of feeding children, allows for their limited disposable income to be spent on other goods and services, and narrows the gap between the rich and the poor. Healthier households are also more productive and likely to earn higher incomes, further reducing the income inequality in the nation.

Higher education grants and tuition subsidies

In addition to providing universal primary and secondary education to all households in a nation, most developed nations also support or provide post-secondary education to citizens. In many European nations, a university education is available to all citizens at reduced tuition fees, which are supported by government subsidies. In the US, higher education is supported by state governments and the federal government. In addition, low-income students are eligible for subsidized loans and government grants based on financial need. Educational grants and subsidies from the government to low-income households represent a type of transfer payment aimed at reducing the education and income gaps explained above.

Welfare benefits

Finally, households whose income is below the official poverty line established by the government may be eligible for welfare benefits. These money payments represent income transfers by the government from high-income earners to low-income households and are intended to subsidize the income of the poor and allow them to enjoy a standard of living beyond that their incomes would allow.

Government expenditures on public goods such as health and education and transfer payments such as welfare and unemployment benefits help governments achieve a more equal distribution of income within their nations. Income inequality is an unavoidable reality of market economies; but it is a reality that should be addressed and offset through responsible fiscal policies involving various types of tax, both direct and indirect, regressive, progressive or proportional in nature.

The extent to which a government attempts to redistribute a nation's income depends on many factors, not the least of which is the political and economic preferences of voters within the nation. European nations such as Denmark and Sweden demonstrate a more socialist lean in their tax and spending policies, the outcome of which is a highly equal distribution of income across society. Some of the most unequal nations, including sub-Saharan African countries such as Botswana, South Africa and Namibia, in which weak political structures and corrupt governments result in the inability to effectively impose taxes on the rich and redistribute them to the poor, remain poor partially due to the inequality in income distribution.

Equality of opportunity implies correcting for social advantage (for example, government might devote more resources to the education of a child brought up in less prosperous circumstances than one brought up in a comfortable home whose parents are university lecturers).

- How far should the state go in making such corrections?
- Should all parents be forced to read to their children so that no child would be at a disadvantage?
- Should the state attempt to correct for the uneven distribution of natural abilities such as IQ (intelligence quotient) by devoting proportionally more resources to children of less than average IQ?

16.6 The relationship between equity and efficiency

Learning outcomes

- Evaluate government policies to promote equity (taxation, government expenditure and transfer payments) in terms of their potential positive or negative effects on efficiency in the allocation of resources.

To access Worksheet 16.3 on Switzerland, please visit www.pearsonbacconline.com and follow the onscreen instructions.

A nation that successfully employs an equitable system of taxes and government spending is likely to achieve a more equal distribution of its income, reduce poverty, increase productivity, and thereby promote the achievement of its other macroeconomic objectives in the process.

A tax system that punishes innovation, productivity and hard work is clearly undesirable and should therefore be avoided. However, a tax system including progressive marginal income taxes combined with regressive indirect taxes ensures that both the rich and the poor share a portion of the nation's tax burden. Yet it also ensures that those with the greatest ability to pay bear the largest burden while those whose ability to pay is lowest benefit from the public goods and transfer payments that the government provides. This reduces the inequality of income distribution and corrects for the market failures that result in a free market system. Equity, efficiency, and increased equality in the distribution of income can all be achieved if a tax system is designed with the ideas outlined in this chapter in mind.

To access Quiz 16, an interactive, multiple-choice quiz on this chapter, please visit www.pearsonbacconline.com and follow the onscreen instructions.

PRACTICE QUESTIONS

1 **a** Using a Lorenz curve diagram and examples, distinguish between a country with a high level of income equality and one with a low level of income equality. (10 marks) [AO2], [AO4]

b Justify the claim that poverty's consequences make its elimination the most important objective of economic policy. (15 marks) [AO3]

2 **a** In what ways might a more equal distribution of income contribute to greater economic growth? (10 marks) [AO2]

b To what extent does greater growth lead to greater income equality?(15 marks) [AO3]

3 **a** Distinguish between progressive, regressive and proportional taxation, providing examples of each. (10 marks) [AO2]

b Evaluate the effectiveness of a progressive income tax at bringing about a more equal distribution of a nation's income. (15 marks) [AO3]