Chapter 55: equity in distribution of income (2.3)

Key concepts
- Definitions of equality and equity
- Failure of market system
- Lorenz curve and the Gini coefficient
- Causes and consequences of poverty
- Equity through taxes – redistribution of income
- Transfer payments and services in kind
- Evaluation of equity policies

HL extensions
- Calculating the marginal tax rate
- Calculating the average tax rate

| The meaning of equity in the distribution of income | • 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 |
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| Indicators of income equality/inequality | • 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 |
| Poverty | • Distinguish between absolute poverty and relative poverty
• Explain possible causes of poverty including low incomes, unemployment, lack of human capital
• Explain possible consequences of poverty including low living standards, lack of access to health care, and lack of access to education |
| The role of taxation in promoting equity | • 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 |
| Other measures to promote equity | • Explain that governments undertake expenditures to provide directly, or to subsidize, a variety of socially desirable goods and services, including health care 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, providing examples including old age pensions, unemployment benefits and child allowances |
| The relationship between equity and efficiency | • 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 |
“The avoidance of taxes is the only intellectual pursuit that still carries any reward.” J. M. Keynes

- **Definitions of equity and equality**
  One of my favourite baiting-games I play with younger students is to claim that there is nothing wrong with a society where people starve alongside the extremely rich. I sometimes refer to the gap in wealth and income to be found in, say, Brazil, and claim that this is perfectly acceptable in terms of economics. We have, after all, solved the basic economic problem of who gets what – we allow income and wealth to decide. I do this towards the end of class in order to make my escape and avoid the inevitable screaming and general outrage. I make sure that the whiteboard is full so that they are preoccupied as I sneak out.
  When the students have cooled down a bit, usually after a few days, I carefully distinguish between ‘equity’ and ‘equality’. **Equity** in economics is a concept meaning ‘fairness’ and ‘justice’, for example, that everybody should have the same right to work, own property and start a company – regardless of gender, ethnicity etc. There would then be fairness in the distribution of output, e.g. a just proportion of wealth to each and every citizen. **Equality**, on the other hand, would mean that everyone would have the same ability to work, own property and start a company – all would get equal portions of the wealth created.

<table>
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<th>Definition: “equity”</th>
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<td>The concept of equity in economics deals with the highly normative concept of fairness in the distribution of wealth and income. Most countries have customs, laws and traditions aimed at giving disadvantaged members of society ‘fair shares’.</td>
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<th>Definition: “equality”</th>
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<td>Equality deals with spreading wealth and income equally, regardless of position or income in society.</td>
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The concept of equity is naturally highly normative and will therefore vary greatly over time and between cultures. There different moral and ethical bases in societies. In line with these differences, governments attempt to create equity, which is to say ‘everybody should have the same chance of bettering his or her situation’. Economics must often deal with the questions of equity:

- Should the rich be taxed proportionately more than the poor and middle-classed? Should they pay more for university education?

- Is it better to tax consumption (value-added taxes, VAT, for example) or income (taxes on profits and dividends)?

- To what extent should the socially/economically disadvantaged be given additional resources at the expense of the economically advantaged – i.e. transfers of income and wealth aimed at evening-out income disparities?

- What about the viewpoint of the wealthy; is it not an economic fact that the goods and services we desire are better furthered by self interest and the profit motives of firms? Is it more economically efficient to increase output rather than re-distribute it? Should not governments try to create a favourable environment for firms and a framework for enterprise in order to increase the cake from which all subsequent taxes and income transfers will be sliced? Wouldn’t society ultimately gain if the incentives to produce (say via low corporate taxes) were enhanced?

- **Failure of market system**
  The above examples are but a small portion of a reoccurring debate within both economics and politics, dealing with the desirability and efficiency of government intervention in matters of equity. We have returned to the issues outlined in production possibility curves earlier, but now with a slightly more ideological and thus political flavour. The appealing simplicity of ‘invest now in order to produce more in the future’ must be appended by realism: it is not at all certain that any part of ‘more’ will be distributed
equitably or evenly. Our basic economic problem is not so basic after all. If output were to grow by 50% and go to 0.1% of the population then we would certainly face some sort of sharp societal reaction – from protest lists to burning tyres in front of parliament. Most countries will have a redistribution system built into government policy, which evens out income differentials to a certain extent. Governments can redistribute income in three basic ways; taxation, transfer payments and goods and services in kind. (See further on.)

- **Lorenz curve and the Gini coefficient**

“Wal-Mart...do they like, make walls there?” Paris Hilton

One of the many controversial areas in economics is the issue of income inequality within societies (often over a time period) and between societies. Media coverage commonly puts this in terms of a ‘gap between rich and poor’, or ‘inequality in country X’. For example, an article in the *International Herald Tribune* states that in 2000 the richest 1% of Americans had more after-tax income than the bottom 40%, representing 15.5% of total national income – triple the level that this group had 20 years earlier.\(^1\) Another article, in *Time Magazine*, points out that in 2003 the wealthiest 1% of Americans accounted for 40% of total wealth (note, not income) while the corresponding value in the UK was 18%.\(^2\)

*Figure 55.1* below shows a simple and graspable way to compare inequality within and between countries, namely the Lorenz curve.

**(Type 4 Smaller heading) Lorenz curve**

In *diagram 1 (figure 55.1)*, the Y-axis shows the cumulative (= collective, summed-up) percentage of total income and the X-axis shows the cumulative percentage of all wage earners. The 45 degree line is the line of perfect equality, i.e. a country where 1% of income goes to 1% of wage earners, 2% of income goes to 2% of wage earners and so forth along the line. The upward-sloping curve is a Lorenz curve, in this case showing that income distribution is rather uneven. The farther away the Lorenz curve is from the line of perfect equality, the more unequal the income distribution. In the example above, the bottom 20% (the first quintile) of wage earners accounts for just 2.8% of total income; the second quintile accounts for 6.4% of income (9.2% - 2.8%); and skipping the next two, the top quintile of wage earners accounts for 61.1% of all income.

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\(^2\) *Time Magazine*, 17 Nov 2003, page 22 (Official US government figures at the US Census Bureau show clearly that income inequality has been increasing from 1947 to 2007. See [http://www.census.gov/hhes/www/income/histine/f04.html](http://www.census.gov/hhes/www/income/histine/f04.html))
(Type 4 Smaller heading) Gini coefficient

How far removed from reality is this example? Well, actually, I have just described Brazil, notoriously one of the most unequal societies in the world. Now, if we wish to compare income distribution in Brazil with other countries (or indeed Brazilian income distribution over time), we can calculate the so-called Gini coefficient, which is a value of the “distance” of the curve from the 45 degree perfect equality line. This is calculated by taking the ratio between area A and A+B (diagrams II and III in figure 3.6.5).

If income were perfectly distributed then the Gini coefficient would be 0. If one wage earner accounted for 100% of income, the coefficient would be 1. The higher the Gini coefficient, the more unequally income is distributed. According to the World Bank in 2007, Brazil had a Gini coefficient of 0.57 while Switzerland had 0.33. The table in figure 55.2 shows these and a few other Gini coefficients for comparison.
The Gini coefficient is a most convenient way of summarising the degree of income inequality in a country, lending readily available figures for comparison. It is immediately apparent that Brazil is indeed a most unequal country in terms of income distribution, rendering a Gini coefficient of 0.57. I have included three of the richest countries in the world as a contrast, where it should come as no surprise that Sweden’s fair-minded egalitarian philosophy and high tax rates results in one of the lowest Gini coefficients in the world; 0.25. The country which probably has the most uneven distribution of income in the world is Namibia, with an estimated Gini coefficient of 0.74. Data from a population census taken in 1994 pointed to the richest 7,000 people (out of a population of 1.4 million) having the total income of the poorest 800,000.

At the other end of the scale, the country with the lowest Gini coefficient in the world seems to be Denmark at 0.247. Keep in mind that the Gini coefficient only measures the relative distribution of income and not poverty levels. There are also a few weaknesses with the Gini coefficient:

- It is quite possible that two countries with entirely different income distributions have the same Gini value.

- Also, the shape of the curve gives information only on total distribution and not on the relationship between the richest and poorest segments (see Kuznets ratio below).

- Finally, a country with a high Gini coefficient might in fact have a generally high standard of living in low income groups – just as it is equally possible for a country with a low Gini coefficient to have widespread poverty across most income groups.
The Kuznets ratio
I have included three additional Outside the box columns in the table in figure 55.2 to show the Kuznets ratio, originating with economist Simon Kuznets. This ratio of inequality is a measurement of the ‘span’ or ‘distance’ between the richest and poorest segments in a society. Taking the proportion of income going to the highest earning 20% - quintile – and dividing it by the proportion going to the poorest quintile gives an indication of the gap between the richest and poorest portions of society. The higher the value of the Kuznets ratio, the greater the distance between rich and poor – e.g. the higher the value the more unequal the income distribution. By this measure, Honduras is more unequal than Brazil in terms of income whereas the Gini coefficient indicated the reverse. Sweden still comes out near the top with a ratio of 3.6.

The Kuznets curve
Another – highly controversial and thus infinitely more famous – concept put forward by Kuznets is that there is correlation between economic growth and income distribution. He posited that during initial stages of economic growth the distribution of income would worsen, i.e. the rich would gain proportionately more of the increased income than the poor. During later – unspecified – stages of growth the distribution of income would improve, i.e. the gap between rich and poor would narrow. Plotting income against income distribution (measured by the Gini coefficient) gives an ‘inverted U’, known as the Kuznets curve where growth in per capita income results initially in worsening income distribution, i.e. a higher Gini coefficient. At some – unspecified – level of income, correlation will reverse and income distributions will improve.

Figure 55.3 Kuznets curve

The Kuznets curve has been fiercely debated for over 40 years now. The proposition that income distribution would at first widen and then narrow was widely studied and by the 1970’s had broad acceptance. Yet a good many later empirical studies show little evidence of either positive or negative systematic relationships between per capita growth and income distribution.

The controversy continues unabated around a curve which Kuznets himself claims was “...5% empirical...95% speculation”!
(TYPE 4 SMALLER HEADING) The world in a Champagne glass

The Gini coefficient for the world has remained very constant at 0.67 since the 1970’s. The Human Development Report of 2005 illustrates the disparities in income between the rich world and the poor world by computing the richest 20% against the poorest 20% of the world’s population. The average income of the top 20% is roughly 50 times higher than the average of the poorest 20%. The “Champagne glass” illustration (figure 5.2.7) shows that the top 20% of account for 75% of world income. The bottom 40% – the “stem” of the glass – account for 5% of world income. The bottom 20% account for 1.5%.3

Figure 55.4 World income distribution, 2000

![World income distribution](image)

(Source: HDR 2005, page 37)

- **Causes and consequences of poverty**

  The term ‘poverty’ is one we all know….or think we know until asked to define it. On a general level, poverty is a situation where people lack basic necessities such as food, clothing and shelter. We would refer to this as **absolute poverty**, commonly defined as a level of income or consumption falling below the minimum level required to meet basic needs, creating a ‘poverty line’ allowing between-country comparison.

  In an attempt to at least have some standardised bar of poverty whereby different countries could be compared more objectively using a common unit, the World Bank has set **international poverty lines** at $US1 and $US2 per day in purchasing power parity terms. Using the World Bank’s updated ‘1.25 $US a day’ as a lower limit, the World Bank estimates that 1.29 billion people (22.4% of the population in LDCs) in the world could be defined as living in absolute poverty in 2008.4 Setting the bar at $US2 the number increases to 2.8 billion people. The problem in using this absolute measure is that what is considered

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3 HDR 2005, page 36.
‘minimum level required’ will vary over time and in different societies, so even the absolute poverty line will change – something the World Bank carefully points out.⁵

**Relative poverty** is the result of uneven income distribution, where the lowest income earners are compared to other groups. This definition is of course highly normative and will vary greatly between different countries, depending on income levels and also upon how ‘poverty’ is defined. The UK defines relative poverty as having an income below 60% of the median net disposable income (income after tax plus transfer payments) while the US sets the bar at 50%. ‘Relative’ in its definitional context of poverty means that the poverty bar will be set according to domestic norms. Thus, a poor person in Iceland – shown in reoccurring surveys to have one of the highest perceived quality of life in the world – would have a king’s ransom as a monthly income according to a squatter on the outskirts of Mexico City. This makes it essentially impossible – and pointless – to compare different countries in terms of poverty levels.

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**Definition: “absolute poverty”**
When people lack the basic resources required to meet basic needs such as food and clothing, one speaks of **absolute poverty**. The World Bank uses a basic metric for a cross-country definition; 1.25USD per day.

**Definition: “relative poverty”**
**Relative poverty** means having an income **below a set median or average**, say less than 50% of the median income. This normative concept varies between countries.

Perhaps the most obvious indicator of lack of development is **poverty**. The UN Millennium Goals of 2000⁶ set down a number of development goals, and at the top of the list was to reduce the amount of people living on less than $US1 (at PPP) per day by 50% by the year 2015. There were close to 1.2 billion people living below this absolute poverty line at the time of the Millennium Summit, and many of them face a predicament known as the **poverty cycle** or **poverty trap**.⁷

Poor people will have a notably low propensity to save, as there will be little enough to spare after basic necessities have been purchased. In other words, savings will have a very high opportunity cost in the form of foregone – vital – consumption. Recall that investment is the mirror image of saving (Section 3.1) and that banks/financial institutions facilitate this flow of funds from households to firms. Economic theory posits that households’ willingness to put aside present consumption in order to increase future consumption is based on income levels. The cycle of poverty is thus:

**Low savings** in developing countries results in…

- …scarcity of investment funds – the investment funds needed by firms to increase output and build infrastructure – and **low investment**,...
- …which is central to a country’s output potential, will hamper economic growth, e.g. result in **low national income**...
- …and since income provides the proportion used for savings, there will be **low**...

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⁵IBID (See also the full text of the 2001 WDR on Poverty at http://www.worldbank.org/poverty/wdrpoverty/report/index.htm

⁶See complete list at http://www.un.org/millenniumgoals/

⁷See for example the HDR 2003, page 41
The cycle is enhanced by two additional forces:

1. Firms’ investment plans are to a certain extent based on predicted consumption levels by households and investment by other firms. A low level of consumption will feed through to continued low investment levels.

2. Low investment (in both fixed and human capital) will stifle productivity gains in the economy and keep real wages low. This too will exert a negative force on incomes and consumption.

*Figure 5.5* looks like a merry-go-round from hell or the Hotel California; you can jump on anywhere but you can’t get off. Yet there are ways for developing countries to get off the negative cycle, for example by creating sound financial institutions and attracting foreign investment. Unfortunately, these and other possible solutions require working governments, political stability, and the rule of law – some or all of which are noticeably lacking in many developing countries.

*(TYPE 3 MEDIUM HEADING) CRITICISM OF THE “POVERTY TRAP”*

One of the most critical economists dealing with development issues is William Easterly (see for example his scathingly critical book “The White Man’s Burden”) and he is quite scornful of what he calls the “poverty trap legend”. He finds little correlation between poverty levels and low growth over the period 1975 to 2001 and puts forward three main points of criticism:

1) While many developing countries indeed showed stagnant and even negative growth during the period, there is little evidence linking low incomes to low growth. The poorest countries’ growth rates did not significantly differ from middle-income countries between 1980 and 2001.

2) Some 11 countries out of the 28 poorest countries in 1975 were not amongst the lowest income countries in 1950 – again belying a clear link between low income levels and poor growth performance.

3) There is much stronger statistical evidence that in fact poor government causes low growth rather than initial poverty; “…stagnation of the poorest countries appears to have more to do with awful governments than with a poverty trap…”

8 Easterly, “The White Man’s Burden”, pages 40 – 52
9 Easterly, page 43
One of the world’s most famous economists, Jeffrey Sachs, head and co-founder of the UN’s Millennium Project, takes an entirely different stance. He identifies six key factors where the cycle of poverty → low investment → low income has severe anti-development effects:

- Low level of *human capital* due to poor health care and education will lower productivity.
- Low level of *business capital* – machinery needed in agriculture, transportation and industry – decreases potential output.
- Insufficient *infrastructure* such as roads, railways, ports, telecoms...etc, limit commerce and the ability of firms to get goods to markets.
- Poor or declining *natural capital* – arable land and healthy soils for example – provide a basis for basic human needs in developing countries.
- *Public and institutional capital* such as a functioning and fair legal system and commercial law enables peaceful and reliable economic transactions. It also decreases parallel markets.
- *Knowledge capital* – scientific and technological know-how not only raises productivity but “creates value” for future generations of entrepreneurs.

**Equity through taxes – redistribution of income**

An American saying pounded into me by generations of hard-headed McGees is that only two things are for certain; death and taxes. Most of my forebears would thus have looked upon the heading ‘A good tax’ as an oxymoron (= contradiction in terms). In any case, taxation of citizens has been a source of heavy debate, disagreement and even civil war for thousands of years. Adam Smith laid down the ‘Canons (= standards, rules) of taxation’ in his magnum opus *The Wealth of Nations*. According to Smith, taxes should have four main characteristics:

1) **Certainty** – those paying should know how much they are paying

2) **Convenience** – they should be easy to collect

3) **Economy** – they should be cheap to collect relative to their yield, i.e. ‘cost-efficient’

4) **Equity** – the sacrifice should be equally felt by those being taxed. (Another issue is of course that the overall effects of taxation should not be counterproductive in terms of the goals of economic policies – see automatic stabilisers in Section 3.5. under ‘fiscal policy’.) Smith was referring to both efficiency and equity, where the cost of collecting the tax deals with efficiency and the ability to pay deals with equity.

**Horizontal and Vertical Equity**

Equity in tax terms means ‘fairness’ of the taxes levied, i.e. that the sacrifice or burden should be felt equally amongst those paying. **Horizontal equity** is ‘treating equals equal’ – for example when IB students get the same amount of time to complete their exams, or workers of equal experience and training are paid the same regardless of sex or age. This concept of ‘equality for equals’ would also apply in tax levies, where two people having the same income should pay the same tax.

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10 Sachs, pages 244 and 245

11 I thought this was amusing until I discovered that many countries in fact have death or funeral taxes.
Vertical equity involves ‘treating different people differently’ in order to enhance ‘fairness’. Continuing with the examples given above; a student with a writing disability can be granted the right to 15 extra minutes in exams and minority groups can be given preferential treatment in job applications. In both these examples, the different treatment of different people can help to even out inequities. In applying vertical equity to taxes, less tax would be paid by low income earners while more tax would be paid by high income households. You no doubt realise that any form of the term ‘equity’ applied to tax rates is highly normative in nature.

(TYPE 3 MEDIUM HEADING) DIRECT TAXATION

When a wage earner receives his/her wages, income tax has for the most part already been deducted. Other taxes which are levied directly on individual incomes are taxes on profits, interest received, capital gains taxes (on income earned by selling property or shares) and dividends from the ownership of shares. Other economic agents, e.g. firms, pay corporate taxes (often called profit taxes), and labour taxes. In each of these cases, the tax is clearly distinguishable and goes directly from the taxpayer to the tax office; these are direct taxes. (Refer back to Section 2.2; PED and taxation, ‘Sorting out the terms; different forms of taxation’.)

Direct taxes on income are associated with two main economic effects.

1) The first is the redistribution effect, whereby income tax is collected and then redistributed to other (less fortunate) members of society. Note that this is not only in the form of money (see ‘transfer payments’ below) but also in the form of health care, education and road networks (‘benefits in kind’ below).

2) The second effect is the possibility of a disincentives effect; when taxes on income increase at higher income levels, workers might not view additional working hours as worthwhile. It is also possible that an unemployed person gets a job and incurs a net loss of disposable income when income tax is paid at the same time as various social benefits disappear – this is a form of poverty trap for low income households. In addition, there is the possibility of a black labour market when increasing tax levels create an incentive for workers to avoid taxes by not reporting income to the tax office.

(TYPE 3 MEDIUM HEADING) INDIRECT TAXATION

One of the snappier comebacks by one of my students in high-tax Sweden was a retort to my inevitable chastisement ‘My tax money paid for that!’ when pupils complained about the school lunch. ‘My tax money paid for it too! Oh, and also for your salary.’ Cheekiness aside, the point is well taken; a good deal of government tax revenue is comprised of taxes on expenditure such as value added taxes (VAT), specific taxes commonly levied on petrol and alcohol (excise duties) and import taxes (tariffs). All of these are indirect taxes, since economic exchanges such as consumption/expenditure rather than individuals are taxed. The tax paid is baked into the exchange and goes – indirectly – to government via the firms selling the goods.

Indirect taxes affect supply which implies that market equilibrium is negatively affected; the supply curve for the good shifts left. While the case is often that this causes a misallocation of resources (and deadweight loss), we have also seen that in fact taxes might serve to decrease negative externalities and therefore instead increase allocative efficiency. An issue worthy of notice here is whether a tax on a good having negative externalities should be designated to cover only its own costs or not. For example, many countries have road taxes which contribute to government tax receipts far in excess of what is subsequently paid for building and renovating roads. A strong case can be made by car owners that they are paying more than their fare share of taxes, since any surplus receipts will benefit those who do not own cars. The
counterargument is that road usage is strongly associated with negative externalities such as pollution and noise, so the additional tax is an adequate disincentive for road use.

**Definition: direct and indirect taxes**

*Direct taxes* are levied on economic agents’ income, wealth or property. Firms pay profit tax and labour tax. Households pay income tax, capital gains tax and property tax. *Indirect taxes* are levied on consumption and expenditure. Value-added tax, excise duties (special taxes on tobacco and alcohol) and tariffs (taxes on imports) are examples of indirect taxes.

(WARNING! Many students confuse *tariffs* with *excise* duties. Perhaps it is because “duties” is so easily associated to “Duty free”? Whatever the origin of the confusion, an excise duty is a tax on “bads”, e.g. alcohol, tobacco and petrol. Oh, one of my American students informed me that there is often an excise duty on *gambling* in the US. I looked it up – he’s quite right.)

(TYPE 3 MEDIUM HEADING) PROGRESSIVE TAX

Direct taxation has one clear advantage over indirect taxes, namely that a direct tax can be adjusted to conform to societal views on equity. Income tax rates can be adjusted to each person’s ability to pay, i.e. adjusted to income. A *progressive tax* on income means that higher income will result in a higher percentage of tax paid, i.e. an increasing proportion of income goes to tax. Most countries will have a systematic increase in the proportion (= percentage) of income tax paid as income rises, since this is virtually the only way in which income can be redistributed – by ‘taking from the rich and giving to the poor’. Commonly in income tax systems, there is a minimum income level where no tax is paid, whereupon the marginal tax – the tax paid on the last money earned – increases.

For example, say that income tax on the first €2,000 is zero but 15% on any income above this. Earning €3,000 would mean that income tax would be paid only on the additional €1,000 – the amount exceeding the threshold of €2,000. This is the *marginal tax rate*. Tax at an income of €3,000 would be €1,000 × 0.15 = €150. (However – take heed! – the *average tax* on income is of course total tax paid over total income; €150 / €3,000 = 5%.)

The progressive taxation element in this method of income taxation is that higher income brackets will mean higher percentage tax paid. Continuing with the example, say that the tax rate progressively increases to 20% for income above €5,000 but below €10,000, and that a person’s income increases from €5,000 to €7,000. The *marginal tax* on the €2,000 above the €5,000 tax bracket is €400 while the *average tax* paid will be €3,000 × 0.15 + €2,000 × 0.2 = €850. The tax rate then increases at every higher income bracket. This is illustrated in the upward sloping – progressive – curve in *figure 55.7*, where the marginal tax rate is of course the slope of the curve.

(TYPE 3 MEDIUM HEADING) PROPORTIONAL TAXES

A *proportional tax* is exactly what it sounds like; a percentage of income paid in tax. Since the percentage is unchanged at higher income levels, there is no marginal tax effect and any rise in income will add to total tax payment at a constant rate, so average tax rate is unchanged. In other words, the proportional tax curve will have a constant slope, as illustrated in *figure 55.7*. Capital gains, corporate profits and dividends are types of income which are frequently taxed on a proportional basis.
Just as indirect taxes can be ‘flat rate’ – such as unit taxes on wine – direct taxation can consist of a fixed sum which does not change as income rises, which means that average taxes paid fall as income rises. A **regressive tax** means that the average proportion of tax paid on income or profit falls as income/profit increases. For example, a yearly business registration tax of £1,000 for a small corner shop with £20,000 in profit means 5% average tax. For Imperial Tobacco Group PLC, the £423 million in profit in 2002\(^\text{12}\) would mean that the registration tax is on average 0,00023%. Since the average tax payment as a proportion of income is falling, the regressive tax curve will become successively shallower, shown below in **figure 55.7**.

**Figure 55.7 Progressive, proportional and regressive taxes**

Another regressive effect of taxation is that lower income groups are often hit harder by **indirect taxes** than higher income groups. Alcohol, tobacco and petrol are all major contributors to total government tax revenues and contain a large element of flat-rate tax (excise duty). The regressive element herein is when low income earners pay the same tax as high income earners; the former are spending a greater proportion of income on the goods than the latter. In fact, value added taxes are arguably regressive since a 10% sales tax on a £100 purchase constitutes a far larger part of income for a person earning £12,000 than for someone earning £120,000. One could say that this lowers the effectiveness of any intended redistribution effects of the tax.\(^\text{13}\)

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\(^{12}\) Annual report Imperial Tobacco PLC at http://www.imperial-tobacco.com

\(^{13}\) I frequently put forward scathing comments on how corrupt police in Mexico are in fact a system of regressive taxation. When police stop drivers for real or made-up offenses, they have a “price list” of fines at the ready (they can draw that list faster than Wyatt Earp could pull his six-shooter). They then make clear how much time, effort and inconvenience it will be for the driver to have to go through the motions of paying the official fine – often claiming that they will also have to confiscate the vehicle. They are waiting for the driver to say “So, how can you help me officer?!?” A common bribe (“mordida” – roughly “little bite”) is 200 Mexican pesos, about USD18. This is four days’ earnings for about 40 million people here in Mexico and about 25 minutes for an expatriate IB teacher. In other words, a flat-rate bribe will hit Benito the day labourer far harder than Graham the IB coordinator. Oh yes, before I forget; the State of Mexico toughened the driving laws two years ago, increasing the number of possible violations while driving. My Mexican friends rather fatalistically called the harsher legislation a tax raise. I called it the cheapest possible form of pay increase for the police – it gives the police more power to extort bribes and the government pays nothing.
Societies often find it necessary and prudent to provide benefits for certain groups of citizens. Social (welfare) benefit systems which redistribute income via cash transfer payments exist in most countries in some form. Students will receive grants and soft loans; retired people receive pensions and additional health care monies; low income households and single parents (far too often one and the same) receive supplemental housing allowance and welfare payments; and unemployed people receive unemployment benefits and perhaps travel contributions for job seeking.

The other main form of societal redistribution is services in kind; merit goods such as health care and education. Since these goods would be both underprovided and thus under-consumed on a free market, it would be the poorer groups who would suffer the most. By using government (tax) monies to provide these goods on a general basis of not-for-profit, total economic welfare is increased.

**Transfer payments and services in kind**

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**Definition: progressive, proportional and regressive taxes**

*Progressive* tax means that the percentage of tax paid increases as income rises – a larger proportion of income goes to tax as income rises.

When the percentage paid is the same no matter what income level, the tax is *proportional* – the same proportion of income goes to tax regardless of income.

A tax that is the same amount of money (flat-rate) regardless of income is a *regressive* tax – a decreasing proportion of income goes to tax as income rises.

**Definition: “transfer payments”**

Any government monies granted to households – without some form of corresponding output – is a transfer payment. Unemployment benefits, housing allowances for low income families and social benefits are examples of transfer payments.

**Definition: “services in kind”**

Under-provided and under-consumed goods such as public transport, education and health care are services often provided directly or indirectly (subsidies) by governments. These services in kind have highly *positive regressive effects* as they benefit poorer households proportionally more than wealthier.

**Evaluation of equity policies**

All taxes will in some way lead to market distortions, since they lead to a decrease in supply and concomitant decrease in quantity demanded. Taxes on labour lead to higher costs for firms and an increase in unemployment; indirect taxes lead to less goods being consumed; corporate taxes lead to fewer new firms and less investment; and capital gains tax reduces incentives and lowers economic activity. However, the economic argument in favour of enduring these distortions is that the allocative losses can be made up for by the overall redistribution gains to society in terms of public and merit goods. Governments use tax receipts to provide goods which are beneficial to all of society. For example, the efficiency loss in firms due to labour taxes are offset by productivity gains arising from a well educated work force, and the relatively small decrease in consumption arising due to high marginal taxes on the richest 1% can be offset by welfare gains when the taxes are redistributed to poorer groups.

(TYPE 3 MEDIUM HEADING) AND JUSTICE FOR ALL…

It gets trickier when governments have to decide which tax creates the ‘fairest’ outcome. Indirect taxes
have the advantage of being simple and easy to collect, but have the disadvantage of levying a heavier burden on the poor than the rich. For example, a unit tax of €2 per litre of alcoholic beverage will have a far greater real income effect on Otto Normalverbraucher\(^\text{14}\) purchasing a €3 six-pack of beer than it will have on Countess Antoinette du la Monet\(^\text{15}\) buying a €150 bottle of 1966 Chateau Neuf du Pape. In effect, a flat-rate tax expenditure tax will have strong regressive tax effects on poorer groups.

As for income taxes, where is it written that higher income must lead to higher proportion of tax – when in fact a proportional tax already means that higher income leads to more tax payments?! The argument for progressive income taxes (‘higher income = higher percentage tax’) is highly normative, in that there is an evening-out effect of incomes which is ‘fair’ to society in general. Increased income equality also has economic benefits, such as lower crime rates and inner city regeneration which, of course, benefits everyone. Quite naturally, the well-off point out that between one third and half of all income tax receipts in developed countries come from the top 5% income earners – the implication being that this is “more than their fair share”. Another common argument put forward by the affluent is that progressive taxes are a major disincentive for people to push themselves, being in fact a ‘punitive tax’ on achievement, hard work and entrepreneurial spirit.

\textbf{(TYPE 3 MEDIUM HEADING) NORMATIVE ECONOMICS – LINK TO DEVELOPMENT ISSUES}

Finally, the field of development economics is rife (= common) with a number of additional key concepts which are either very broadly used and/or subject to the same \textit{normative limitations} as above. Using terms such as ‘equitable’ or ‘inequitable’ distribution of income/resources clearly means that one has drawn a normative line somewhere. Just imagine two societies; Society A consists of 1 million people where 980,000 people are well off and 20,000 are living in poverty and Society B of 2 million people where 30,000 live in poverty. Which society is ‘best’ in terms of income distribution? Well, if you use ‘amount of poor people’ then A is preferable. If you use ‘percentage living in poverty’ then B is likely to be preferable. Now, assume a third society, C, consisting of 30,000 people where 29,999 lived in poverty. Using ‘amount of poor people’ to define ‘best’ would point to Society C being preferable to both A and B. Of course my example is hideously exaggerated, but the point is that positive economics runs into some severe obstacles in development.

\textbf{(TYPE 3 MEDIUM HEADING) YET ANOTHER TRADE-OFF?}

Notice the question mark in the above heading and prepare yourself for another of my “No, there is no answer” paragraphs. Redistributing income has a double-edged price tag of administrative costs to government and allocative losses to society. Redistribution has been likened to attempting to transfer water from one bucket to another.\(^\text{16}\) A portion of the water – income – will invariably be lost in the process, i.e. there will be costs associated with administration and economic efficiency. The taxes on economic endeavours such as labour and investment also render opportunity costs in the form of forgone…labour and investment. This argument thus puts forward that attempting to improve social welfare by increasing equity will render a social cost in terms of greater inefficiency in the use of resources which leads to a loss of income.

The basic question here is whether the costs to society of trying to increase equity are counterproductive in terms of economic growth. The trade-off, according to this line of reasoning, is between growth in total income and growth in income equality. In the final analysis, a good many studies show that there is indeed a trade-off – increased income inequality is ‘pro-growth’. However, a good many studies show the reverse, i.e. that greater inequality leads to lower growth! And for my final trick; a recent study by the OECD

\textsuperscript{14}German for ‘Joe Average’

\textsuperscript{15}Pronounced ‘de Money’

showed “…no evidence that the level of income inequality affects GDP one way or another.”

I told you there would be no answer.

HL extensions

- Calculating the average tax rate

The table in figure 55.8 outlines three income brackets of between £10,000 and £200,000. Assume that taxes are levied at a regressive, proportional or progressive rate. The flat rate and proportional taxes should be no problem filling in.

**Figure 55.8 Summary of income taxes**

<table>
<thead>
<tr>
<th>Tax payments on a gross income of:</th>
<th>£10,000 – 20,000</th>
<th>£20,001 – 40,000</th>
<th>£40,001 -</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tax paid (£)</td>
<td>Tax paid (£)</td>
<td>Tax paid (£)</td>
<td>Tax paid (£)</td>
</tr>
<tr>
<td>Average ( %)</td>
<td>Average ( %)</td>
<td>Average ( %)</td>
<td>Average ( %)</td>
</tr>
<tr>
<td>Regressive tax (flat rate £1,500)</td>
<td>£1,500 xx%</td>
<td>£1,500 xx%</td>
<td>£1,500 xx%</td>
</tr>
<tr>
<td>Proportional tax (15%)</td>
<td>£xxx 15%</td>
<td>£xxx 15%</td>
<td>£xxx 15%</td>
</tr>
<tr>
<td>Progressive tax (rates of 15%, 30%, 40%)</td>
<td>£xxx 15%</td>
<td>£xxx 20%</td>
<td>£xxx 30%</td>
</tr>
</tbody>
</table>

Using the progressive income tax tiers, calculate the total income tax paid by Bob (gross income of £19,000), Lisa (£35,000) and Leslie (£75,000).

- Calculating the marginal tax rate

Progressive taxes mean a higher percentage tax paid on higher incomes. (In Sweden we say ‘the tax on the last SEK100 earned’ if this helps.) Thus, for incomes up to £20,000 the tax is 15% but any income in the next two tiers will have a higher average tax rate. The marginal rate is calculated by taking the change in total tax paid divided by the change in income, times 100; 

\[
\frac{\Delta T}{\Delta y} \times 100
\]

Note that the marginal rate will stay the same moving from £12,000 to £14,000 within the same tax tier (15% on the additional £2,000) but will be higher when moving into the next tier.

- Bob’s gross income increases from £19,000 to £21,000. Calculate the marginal tax rate on the additional £2,000. (See footnote for some help.)
- Calculate Lisa’s marginal tax when her gross income increases from £35,000 to £44,000.

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18 Bob is initially paying 15% on £19,000; £2,850. At £21,000 he will pay 15% on £20,000 and 30% on the £1,000 in the higher tax bracket. Add these two values and you get the new average tax paid. Deduct original average tax paid (£2,850) and you have the numerator in the marginal tax formula. Stick in the denominator (change in income of £2,000) and multiply by 100.
12,000 is 1,800… and 14,000 is 2,100… increase in tax is 300 and increase in $y$ is 2,000; this is a 15% tax. $\Delta y = 2,000…$ new tax is $(20,000 \times 0.15 + 1,000 \times 0.3 = £3,300)$

- Old tax is 2,850
- $\Delta T; 3,300 - 2,850 = 450$
- $(450 / 2,000) \times 100 = 22.5\%$
Summary and revision

1. **Equity** is the normative concept of “fairness” in the distribution of wealth and income.
   a. **Horizontal equity** means ‘treating everyone the same’ – everyone over 18 gets a vote and nobody can be denied entrance to university based on sex or income.
   b. **Vertical equity** is treating some individuals differently to create ‘fairness’ – such as a parliamentary quota system for women (50% of MPs in Norway must be women) and preferential university entrance for minority groups.

2. **Equality** means equal shares of wealth and income.

3. Income inequity is often seen as a **failure of the market system**.

4. The **Lorenz curve** measures inequality of income distribution by plotting out the cumulative percentages of income and cumulative percentages of households. The line of perfect equality means that 1% of households receive 1% of income, 5% off households receive 5% of income…etc. The further away from the line of perfect equality a country’s Lorenz curve is, the more unequal the distribution of income.

5. The **Gini coefficient** is based on the Lorenz curve. It measures the area between the Lorenz curve and the line of perfect equality as a proportion of the total area under the line of perfect equality. Values can range from 0 to 1 where the higher the value the worse the distribution of income.

6. **Poverty** has many causes – primarily the effects of low incomes. Low savings rates and investment lead to low income (poverty trap) which perpetuates low levels of governments spending on merit goods and infrastructure…and thus low incomes.

7. **Effects of poverty** are low standards of living and lack of opportunities. This means malnourishment, poor education, low paying jobs, poor health, low life expectancy and destruction of natural resources.

8. **Direct taxes** are taxes going directly to government from the taxpayer, for example income tax, profit (corporate) tax and capital gains tax (tax on profits made selling shares or a house).
9. **Indirect taxes** are taxes based on a transaction and go from taxpayers (e.g. consumers) via firms to government – expenditure taxes such as ad valorem (value-added) taxes and excise duties are indirect taxers.

10. A **progressive** tax means that the average proportion of tax paid increases as income rises. **Proportional** tax has the same percentage average tax at every level of income. **Regressive** tax means that the average tax decreases as a percentage of income decreases as income rises.

11. Governments commonly intervene in markets to **increase equity** via various forms of income re-distribution. Common methods are taxes on luxury goods; subsidies for basic necessities such as milk and rice; hugely differentiated property taxes; marginal tax rates; various forms of transfer payments (social benefits and housing allowances for example); and services in kind (public and merit goods whose benefits are highly regressive – lower income groups benefit proportionally more than higher income groups).

**HL extension**

12. The **average tax rate** is calculated as the average tax paid divided by total income times 100 (Rory; what the hell is the Anglo version in math-speak for ‘average’?! We always used Ø but this is wrong in English.) \((\bar{\thetaT}/\bar{y}) \times 100\)

13. The **marginal tax rate** is calculated by dividing the change in tax paid by the change income times 100 \((\DeltaT/\Deltay) \times 100\)