

FEATURE

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The redistribution of household income 1977 to 2006/07

SUMMARY

This is the second of two articles on changes to the UK income distribution over the last 30 years. It analyses the role that taxes and benefits played in changes to the income distribution over this period. The article considers the impact of both changes to the tax and benefit systems, and changes to the way in which those systems acted upon a changing population and income distribution. A companion article, 'The distribution of household income 1977 to 2006/07' (see References section), provides an analysis of changes to the income distribution. Both articles draw mainly on data published in the Office for National Statistics' annual article 'The effects of taxes and benefits on household income' which is also known as the Redistribution of Income (ROI) analysis.

Government intervention through taxes and benefits plays an important role in determining the distribution of household income, and the level of income inequality. However, over the last 30 years, changes in the income distribution have been caused predominantly by changes in the distribution of original income (income before taxes and benefits), rather than changes in the impact of taxes and benefits. This is despite many changes to the tax and benefits systems over this period.

Cash benefits reduce income inequality and between 1977 and 2006/07 their impact on income inequality did vary significantly over the short term. These variations were to a large extent related to economic cycles – payments of cash benefits increased when income from employment fell. In order to interpret statistics on the income distribution, it is important to understand these cyclical effects. Aside from cyclical variations, there is no evidence of any major underlying change in the impact of cash benefits on income inequality over the last 30 years.

Direct taxes also reduce income inequality. The extent to which they reduced inequality varied between 1977 and the mid-1990s and was then relatively unchanged after the mid-1990s. On average, direct taxes reduced inequality slightly more in this latter period compared with earlier years. However, in the context of the large increase in inequality of original income between 1977 and the mid-1990s, any greater equalising effect of direct taxes was limited.

Indirect taxes are regressive and so have

the opposite effect to direct taxes – they increase inequality. The extent to which they increased inequality grew gradually between the late 1970s and the start of the 1990s, and has been relatively stable since then. Direct taxes and indirect taxes have opposite effects on income inequality which tend to cancel each other out. Over the last 30 years, even the changes in their respective impacts on inequality worked in opposite directions and so tended to cancel each other out.

The state also provides benefits in kind to households, and the two most important that are considered here are health and education services. In this analysis, benefits in kind are valued by the costs of production which are allocated to households according to assumptions about households' use of these services. The allocation of benefits in kind to the bottom fifth of households increased over the last 30 years due to higher numbers of children living in households in this part of the income distribution.

The households which benefit most from redistribution are one-adult households with children and retired households. Households with children do better than households without children due to the additional benefits they receive, both cash benefits and benefits in kind. Over the last 30 years, there were some short-term variations in the extent to which different types of household benefited from redistribution, but over the longer term this underlying pattern has been relatively stable.

Analysing the redistribution of income

The ROI analysis

This article uses data from the Office for National Statistics' annual Redistribution of Income (ROI) analysis to assess the impact of the tax and benefit systems on the UK income distribution and income inequality over the last 30 years. The first section describes the framework which is used by the ROI analysis to measure the effect of taxes and benefits on household income. The subsequent sections of the article then follow the successive stages of this framework: cash benefits; direct taxes; indirect taxes; and benefits in kind. They assess changes in the impact of each stage of redistribution upon households in general, and upon the income distribution and income inequality.

The ROI is a longstanding analysis which is based on income and expenditure data from the Expenditure and Food Survey (EFS). Prior to 2001/02, it was based on the Family Expenditure Survey (FES), the predecessor of the EFS. The analysis has used a broadly consistent approach since 1987. By recalculating data for the years 1977 to 1986, a more consistent dataset has been produced to enable an analysis of changes in the effect of taxes and benefits over the last 30 years.

The ROI analysis has used the same framework for analysing the redistribution of household income for many years (Figure 1). Household members receive income from employment, occupational pensions, investments and from other non-government sources. This is referred to as original income. The first stage in the redistribution of income is the receipt of cash benefits provided by the state. Adding income from cash benefits to original income gives gross income. Households pay direct taxes out of gross income. Subtracting direct taxes from gross income gives disposable income.

When households purchase goods and services, they incur indirect taxes. The ROI analysis uses expenditure data to estimate each household's payment of indirect taxes. These are subtracted from disposable income to give an estimate of post-tax income. Households are also assigned nominal incomes to reflect their receipt of benefits in kind from the state, the most important being health and education services. These nominal incomes are estimated based on the cost of providing the services, and are added to post-tax income to give a measure of final income.

The unit of analysis is the household. Households are ranked by their equivalised

disposable income. Equivalisation is a standard methodology which is used to adjust incomes in order to take account of the demand on resources of households of differing size and composition. The ROI analysis uses the McClements scale for equivalisation (Jones 2008).

While households are ranked by their equivalised disposable income, the estimates of incomes, taxes and benefits within this framework are generally unequivalised. Unequivalised incomes are more appropriate for analysing the effects of individual taxes and benefits on household income although, over time, the estimates are affected to some degree by changes in average household size (see technical note 5). Equivalised versions of original, gross, disposable and post-tax income, which take account of changes in household size and composition, are used to assess the impact of each stage of redistribution upon the income distribution and income inequality. Final income is not equivalised since the equivalisation scale is not applicable to the nominal incomes representing benefits in kind.

Cash benefits

The purpose of most cash benefits is to provide a 'reasonable' standard of living to households who, for whatever reason, have little or no original income. Income from cash benefits increased in real terms (in 2006/07 prices) from £2,400 per household per year in 1977, to £4,600 in 2006/07. This growth in income from cash benefits was similar to the growth in gross household income over the same period, although growth in benefit income tended to be most rapid in years when gross income either grew slowly or fell.

Income from benefits increased most rapidly in the early 1980s, early 1990s, and to a lesser extent the early 2000s (Figure 2). The recessions of the early 1980s and early 1990s led to increased reliance on income from benefits for some households. In the early 2000s, the maturing of the earnings-related component of the state retirement pension and tax credits led to real increases in income from cash benefits.

There are two broad types of cash benefit: contributory benefits, which are paid from the National Insurance Fund, to which individuals (and their employers) make contributions while working; and non-contributory benefits, many of which are means tested. Contributory benefits include the state retirement pension, incapacity benefit, jobseeker's allowance, and widows' benefits. Non-contributory benefits

Figure 1
Stages of redistribution

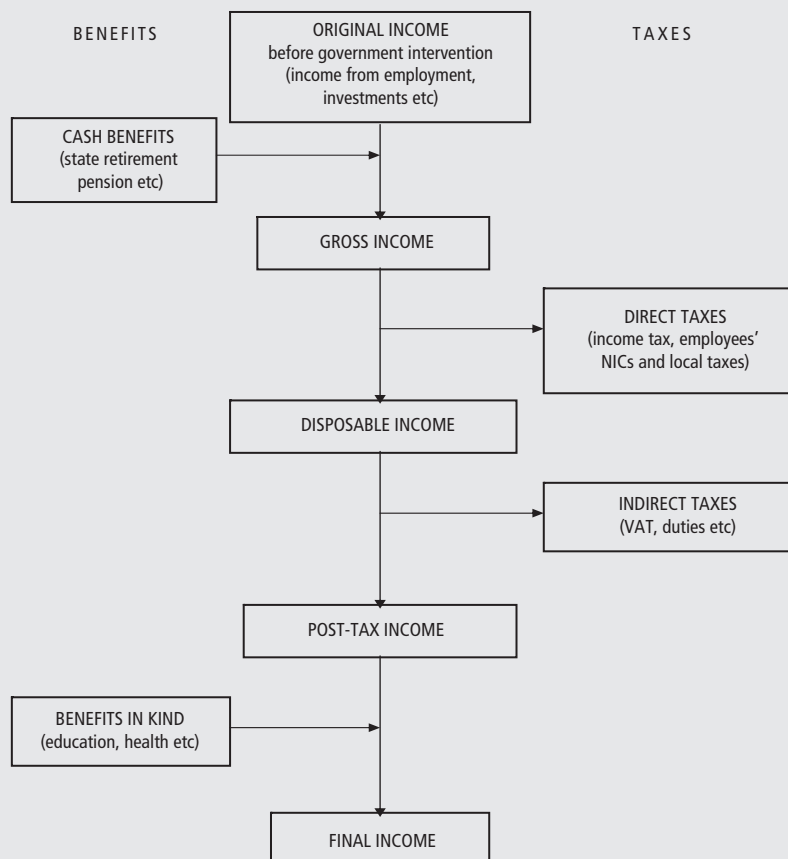
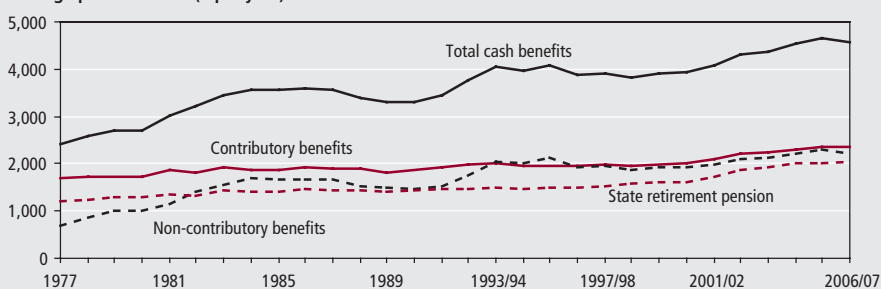


Figure 2
Income¹ from cash benefits in 2006/07 prices

Average per household (£ per year)



Note:

1 Income before tax, unequivalised.

include housing benefit, income support, child benefit, various disability and carer's benefits and tax credits.

Income from contributory benefits

Income from contributory benefits grew relatively slowly in real terms increasing from £1,700 per household per year in 1977 to £2,360 in 2006/07, with over half of this increase occurring in the early 2000s. This largely reflects growth in income from the state retirement pension which is by far the largest contributory benefit. During the 1980s and early 1990s, the basic state pension was uprated in line with inflation, and so there was little real growth in income from this source. There was gradually increasing growth from 1996/97 onwards due to the maturing of the earnings-related component of the state pension (SERPS, replaced in 2002 by the state second pension). There were also above inflation increases to the basic state pension in the early 2000s. Over this whole period, the old age dependency ratio – the number of people of state pension age and over as a percentage of the working age population – remained roughly constant.

Total income from other contributory benefits remained at a roughly similar level between 1977 and the early 1990s, but then declined in real terms. Income from unemployment benefit was high in the early 1980s (Figure 3), as the claimant count rose to 3 million. However, during the 1980s, there were many changes to the unemployment benefit rules, many of which were to the disadvantage of the unemployed (Atkinson and Micklewright 1989). When in 1993 the claimant count again came close to 3 million, income from this source was lower than it had been in the early 1980s. In the late 1990s and early 2000s, income from jobseeker's allowance (which replaced unemployment benefit in 1996) declined due to the falling number of claimants.

Income from invalidity benefit and sickness benefit increased sharply in the early 1990s as the number of claimants increased from 1.5 million in 1990 to 2.4 million in 1995. In 1995, invalidity and sickness benefits were replaced with incapacity benefit which for some new claimants provided a lower level of income. There was also some decline in the number of people receiving income from incapacity benefit between 1995 and 2006/07.

Widows' benefits (or bereavement benefits from 2001), paid to those who are widowed and under pensionable age, declined in real terms throughout this period due to a falling number of claimants. Falling marriage rates, rising divorce rates and an increase in male life expectancy all combined to reduce the number of widows aged under 60 (House of Commons Library 1998).

Income from non-contributory benefits

Income from non-contributory benefits increased more rapidly than income from contributory benefits in real terms, from

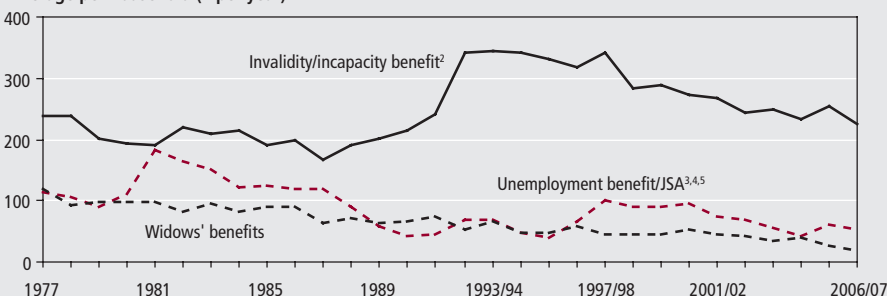
£700 per household per year in 1977 to £2,220 in 2006/07. The periods of most rapid increase were the early 1980s and the early 1990s although, as with contributory benefits, there was faster growth in income from non-contributory benefits in the early 2000s. In 1977, average income from non-contributory benefits was less than half that from contributory benefits but since the mid-1990s contributory and non-contributory benefits have accounted for roughly equal proportions of total benefit income. The increase in income from non-contributory benefits between 1977 and the early 1990s was mainly due to an increase in the number of non-retired households with no earner.

The increases in income from non-contributory benefits in the early 1980s and early 1990s were due primarily to increased income from income support (supplementary benefit before 1988/89) and housing benefit after its introduction in 1982–1983 (Figure 4). In addition to the effect of the recessions of the early 1980s and early 1990s, there was also an increase in the number of lone parents throughout this period. This would have resulted in a more long-term increase in the number of income support and housing benefit claimants. The introduction of housing benefit coincided with a fall in government subsidy of social housing (measured as a benefit in kind in the ROI analysis).

Income from non-contributory disability and carer's benefits gradually increased in real terms due to the increased number of claimants. Berthoud (1998) suggested that this was due to the increased length of time individuals remained on benefits, exclusion from the workplace, and some extension of payments further down the scale of severity of disability.

Figure 3
Income¹ from selected contributory benefits in 2006/07 prices

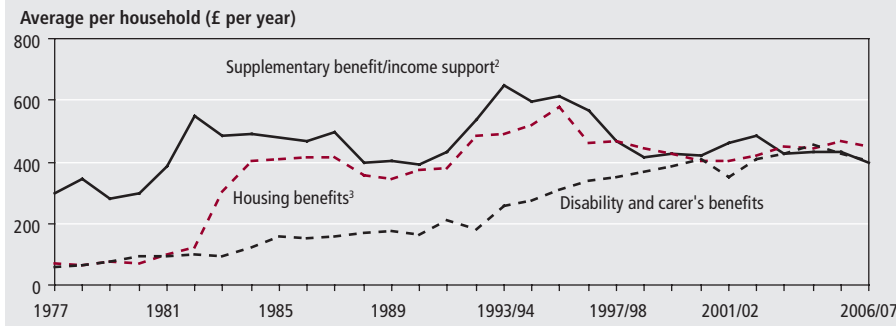
Average per household (£ per year)



Notes:

- 1 Income before tax, unequivalised.
- 2 Invalidity and sickness benefit before 1995, incapacity benefit thereafter.
- 3 Unemployment benefit before October 1996, jobseeker's allowance (JSA) thereafter.
- 4 Includes both contribution and income-based JSA.
- 5 On its introduction, JSA replaced income support for some claimants.

Figure 4
Income¹ from selected non-contributory benefits in 2006/07 prices



Notes:

- 1 Income before tax, unequivalised.
- 2 Supplementary benefit before 1988/89, income support thereafter. Includes pension credit.
- 3 Includes council tax benefit and its predecessors until 1995/96 – see technical note 4.

The faster growth in income from non-contributory benefits in the early 2000s was due primarily to increased income from tax credits (Figure 5). Before the current child tax credit and working tax credit were introduced in 2003/04, there were a number of benefits aimed at working families with dependent children (including lone parents): working families tax credit (1999 to 2003), family credit (1988 to 1999), and family income supplement (before 1988). In the 1970s and 1980s, the number of claimants was low. However, from 2003/04 in particular, the increased generosity of the child tax credits resulted in them becoming an increasingly important source of income for many households with children. Figure 5 shows only those tax credits treated as a benefit (some tax credits are treated as a negative tax – see technical note 1).

Income from child benefit declined in real terms during the late 1980s, then remained at roughly the same level during the 1990s and early 2000s. Child benefit was introduced in 1977 (replacing the family allowance) and there were large increases in the rates of this benefit in 1978 and 1979.

The impact of cash benefits on the income distribution

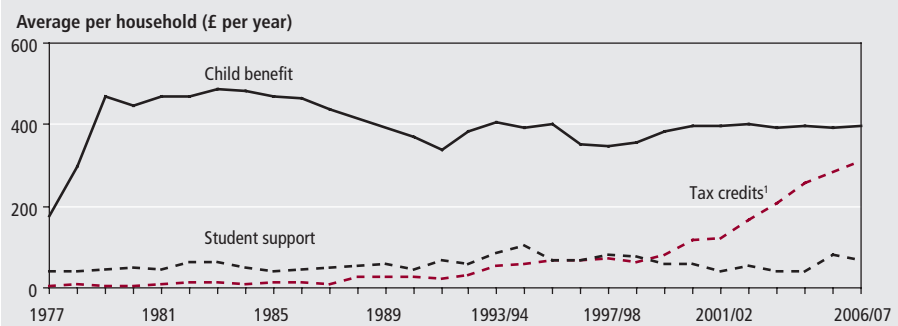
The impact of cash benefits on the income distribution can be illustrated by comparing the distributions of equivalised original and gross income (Figure 6). Cash benefits reduce income inequality, increasing the income share of the bottom two quintile groups and reducing the income share of the top two quintile groups. There were some changes in the impact of cash benefits on each quintile group over the last 30 years. For example, in more recent years, the bottom quintile group benefited less than in earlier years, while the second and third quintile groups benefited more. In recent years, the income share of the fourth

quintile group was reduced by less than in earlier years, but the share of the top quintile group was reduced by more.

These changes do not point unambiguously either to an increase or decrease in income inequality due to cash benefits. In fact they were due primarily to changes in the position of retired households in the income distribution, mainly between 1977 and 1996/97 (Jones *et al* 2008). Retired households receive a large proportion of total cash benefits (mainly due to the state pension), so the impact of cash benefits across the income distribution depends to quite a large extent on the position of retired households in the income distribution.

The ROI analysis also calculates Gini coefficients to measure inequality for

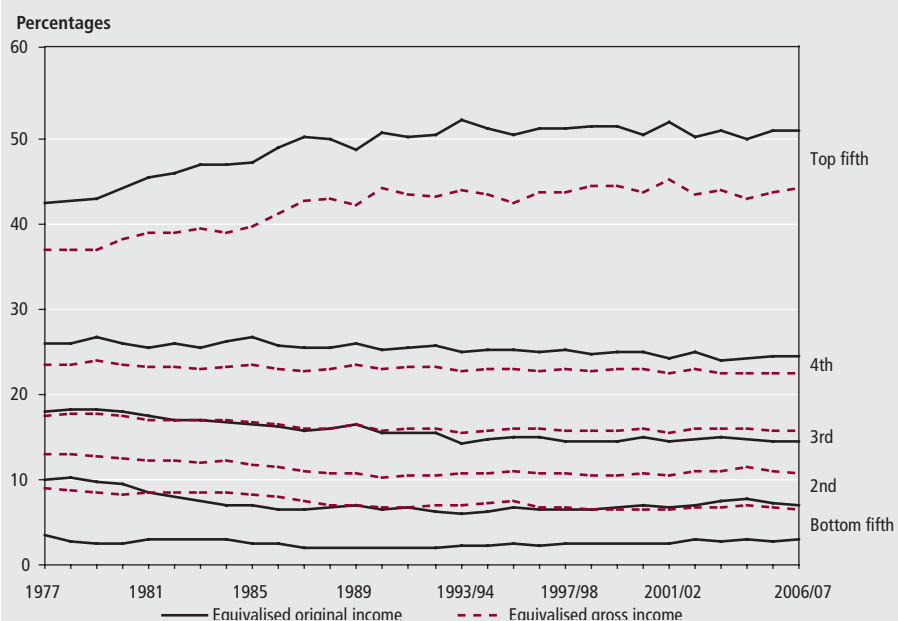
Figure 5
Income from child or education-related benefits in 2006/07 prices



Note:

- 1 Working families tax credit (1999 to 2003), family credit (1988 to 1999), family income supplement (before 1988).

Figure 6
Shares of total original and gross income by quintile group¹



Note:

- 1 Households are ranked by equivalised disposable income.

each measure of income. A comparison of the Gini coefficients for original and gross income also suggests that there was no long-term change in the effect of cash benefits on income inequality. In 1977, cash benefits reduced the Gini coefficient from 43 per cent for original income to 29 per cent for gross income. In 2006/07, although inequality had increased, the size of the

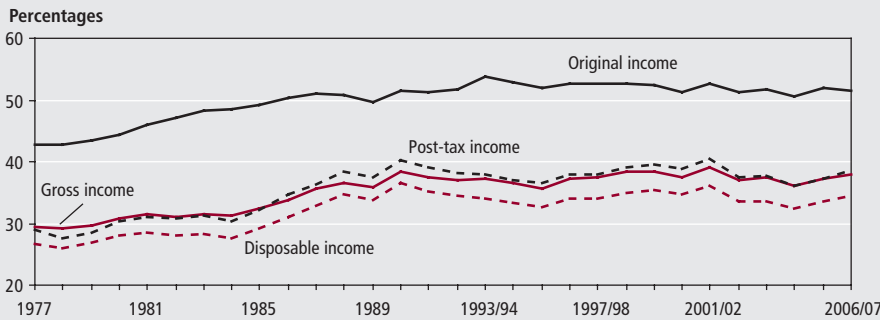
reduction was the same, from 52 to 38 per cent (Figure 7).

While there was no long-term change in the impact of cash benefits on income inequality, over the shorter term, the extent of redistribution through cash benefits is highly cyclical. This is apparent if the short-term trend in the Gini coefficient for original income is compared with that

for gross income (and the other income measures).

A good indicator of the extent of this redistribution through cash benefits is the proportion of total gross household income that they provide. During and following the recessions of the early 1980s and early 1990s, cash benefits contributed a substantially higher proportion of gross income than in other periods (Figure 8). Cash benefits accounted for 17 per cent of gross household income in 1984, and 16 per cent in 1993/94, compared with an average of 14 per cent over the whole period. In the early 2000s, there was a smaller increase in cash benefits as a proportion of household income. However, this was not the result of recession, but due to increased income from the state retirement pension and tax credits. In 2006/07, this proportion fell slightly compared with the previous year, and in fact was very close to its level in the late 1970s.

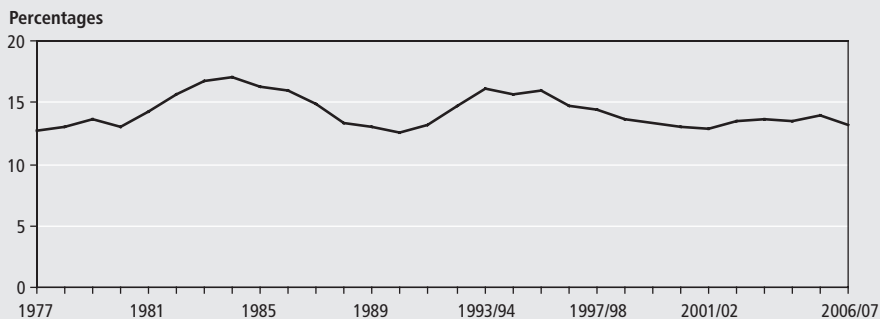
Figure 7
Gini coefficients¹



Note:

1 See technical note 6 for an explanation of the Gini coefficient.

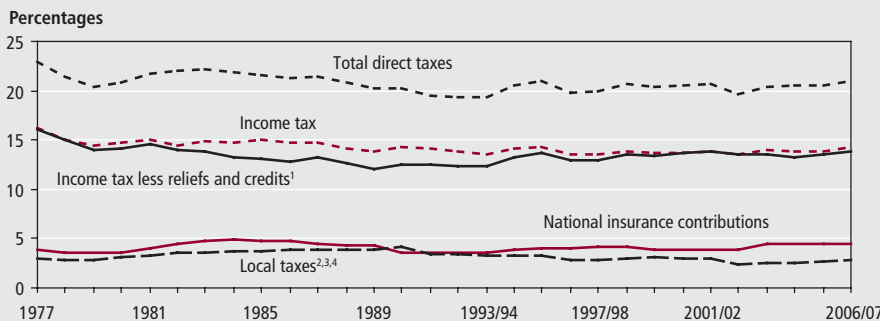
Figure 8
Income from cash benefits as a percentage of gross income¹



Note:

1 Unequalised.

Figure 9
Direct taxes as a percentage of gross income



Notes:

- 1 Reliefs and credits includes mortgage interest relief at source until 2000, and tax credits from 2003/04 – see technical note 1.
- 2 Includes domestic rates until 1990, community charge between 1989 and 1992, and council tax from 1993/94 onwards.
- 3 From 2002/03 onwards, there was a change in the treatment of water charges – see technical note 2.
- 4 From 1996/97 onwards, there was a change in the treatment of council tax benefit – see technical note 4.

Direct taxes

In the ROI analysis, direct taxes consist of income tax, national insurance contributions and local taxes. Over the last 30 years, direct taxes accounted for between 19 and 23 per cent of gross household income (Figure 9). Direct taxation as a proportion of gross income fell in the late 1970s due to income tax cuts, but then rose in the early 1980s due to rises in national insurance contributions. Then, through the late 1980s, direct taxes fell from around 22 per cent to below 20 per cent of gross household income at the start of the 1990s. This was due to cuts in both income tax rates and the rate for national insurance contributions. However, in the early 1990s, direct taxes increased again, to around 20 or 21 per cent of household income. This increase was partly due to restrictions on mortgage interest tax relief and then a further increase to the national insurance contribution rate. Major changes to direct taxes over this period are listed in Box 1.

Since the mid-1990s, direct taxes have remained around 20 or 21 per cent of household income. Since 2003/04, tax credits, some of which are treated as negative income tax, have reduced the effective rate of income tax by about 0.5 percentage points (technical note 1 describes the ROI's treatment of tax credits). Figure 9 shows a fall in average payment of total direct taxes in 2002/03 which was caused by a fall in local taxes. In fact this was largely due to a definitional change relating to water charges, which were no longer included in local taxes from 2002/03

Box 1

Major changes to direct taxes 1977 to 2006/07

Income tax

- Standard rate cut from 34 to 30 per cent, top rate cut from 83 to 60 per cent (1977/78 to 1979/80).
- Standard rate cut from 30 per cent to 25 per cent (1985/86 to 1988/89).
- Top rate of income tax reduced to 40 per cent (1988/89).
- Mortgage interest relief at source (MIRAS) restricted (1990s) then abolished (2000).
- Starting rate of 20 per cent introduced (1992/93), later reduced to 10 per cent (1999/2000).
- Standard rate cut from 25 to 22 per cent (1995/96 to 2000/01).
- Married couple's allowance abolished for people born after 1935 (2000/01).
- Decline in the value of the single person's allowance relative to earnings (mid-1980s to 2006/07).
- Introduction of working families' tax credit (1999/2000), children's tax credit (2001/02), which were then replaced with the child tax credit and working tax credit (2003/04).

National insurance contributions

- Employee contribution rate increased from 5.75 to 9 per cent of all earnings (1977/78 to 1983/84).
- Introduction of tiered lower rates of 5 and 7 per cent for low earners (1985/86).
- Tiered rates replaced with a rate of 2 per cent (the main contribution rate remained at 9 per cent) (1989/90).
- Main employee contribution rate increased to 10 per cent (1994/95).
- Employee contribution rate increased to 11 per cent and a new 1 per cent rate was introduced for all earnings above the upper earnings limit (2003/04).

Local taxes

- The community charge replaced domestic rates in 1989/1990 (except in Northern Ireland).
- The council tax replaced the community charge from 1993/94 (except in Northern Ireland).

onwards. Comparisons of tax payments before and after 2002/03 are therefore affected by this change, which is described in more detail in technical note 2.

Direct taxes by quintile group

The effect of at least some of the changes described above can be seen in the direct tax burden upon each quintile group (Figure 10). It should be remembered that changes in direct tax paid by each quintile group will reflect not only changes in the tax system but also changes in the underlying income distribution upon which the tax system acts. It is not possible to separate these two effects.

The income tax cuts of the late 1970s benefited the lowest quintile groups most. The direct tax cuts of the late 1980s benefited the middle and upper quintile groups. The cuts in the standard rate of income tax through the late 1980s reduced direct taxes as a proportion of household

income for households in the third and fourth quintile group, while the reduction in the top rate of tax in 1988/89 benefited the top quintile group in particular. However, the tax rises of the early 1990s worked in the opposite direction and the restrictions on mortgage interest tax relief, in particular, impacted most upon the upper three quintile groups (Table 1).

Over the period as a whole, there was a reduction in total direct taxes paid by households in the lower quintile groups as a proportion of their gross income, and only direct taxes for the top quintile group remained at about the same level. This steady reduction in the level of direct taxes for lower quintile groups took place between 1977 and the mid-1990s and was due primarily to falls in the payment of income tax (Table 1). Between the mid-1990s and 2006/07, the discontinuity in 2002/03 discussed above makes interpretation rather difficult. The

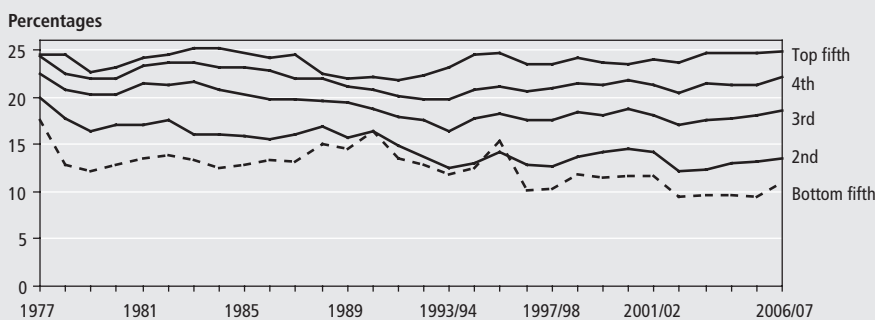
rate for national insurance contributions was increased from 2003/04 and this led to some increase in total direct tax payments mainly for the upper three quintiles.

The fall in the average proportion of gross income paid out in income tax by each of the lowest four quintile groups, which took place between 1977 and the mid-1990s, was due in part to reductions in income tax rates. For example, the standard rate of income tax was reduced from 34 per cent in 1977/78 to 24 per cent in 1996/97, with the largest cuts coming in the late 1970s, and the late 1980s.

The higher rates of income tax, paid mainly by people living in households in the upper part of the income distribution, were also cut substantially between 1977 and the mid-1990s. In 1977/78, taxable earnings over £24,600 (in 2006/07 prices) were taxed at 40 per cent, with tiered higher rates, the highest of which was 83 per cent applicable to all taxable earnings over £86,100 (in 2006/07 prices). After a major reduction in 1979/80, these tiered higher rates were reduced again in 1988/89 to a single top rate of income tax of 40 per cent. However, while higher rates of income tax were cut, there were increases in the number of higher rate taxpayers (HMRC 2008), and in the proportion of total household gross income subject to higher rate tax.

Whereas the proportion of gross income paid in income tax by households in lower quintile groups fell, that paid by households in the top quintile group remained about 18 or 19 per cent, and total direct tax as a proportion of gross income for the top quintile group was effectively the same in 2006/07 as in 1977.

Figure 10
Direct taxes as a percentage of gross income by quintile group¹



Note:

1 Households are ranked by equivalised disposable income.

Table 1
Direct taxes as a percentage of gross income by quintile group

	Income quintile groups of all households ¹					Percentages
	Bottom	2nd	3rd	4th	Top	All households
Income tax						
1977	9.1	12.4	15.3	17.6	18.6	16.2
1981	5.1	9.4	14.0	16.4	18.6	15.0
1986	3.7	7.3	12.4	15.8	18.9	14.7
1991	3.4	7.1	11.6	14.7	18.3	14.2
1996/97	3.8	6.4	10.6	13.5	17.9	13.5
2001/02	3.2	6.9	10.3	13.5	18.4	13.8
2006/07	4.3	7.7	11.3	14.2	18.6	14.3
less tax reliefs (including MIRAS and tax credits)²						
1977	0.1	0.2	0.2	0.1	0.1	0.1
1981	0.4	0.4	0.5	0.5	0.5	0.5
1986	0.9	1.2	1.9	2.0	2.1	1.9
1991	0.9	1.3	1.8	2.0	1.8	1.7
1996/97	0.5	0.5	0.6	0.6	0.5	0.6
2001/02	0.0	0.0	0.0	0.0	0.0	0.0
2006/07	0.7	1.3	0.8	0.4	0.1	0.4
Employees' national insurance contributions						
1977	2.5	3.6	4.2	4.3	3.8	3.9
1981	1.8	3.4	4.5	4.6	3.9	4.0
1986	1.5	3.1	5.0	5.7	4.8	4.7
1991	1.1	2.6	3.9	4.4	3.6	3.6
1996/97	1.3	2.7	4.2	5.0	4.2	4.0
2001/02	1.2	2.4	4.0	4.8	3.9	3.8
2006/07	1.6	3.1	4.6	5.6	4.5	4.4
Local taxes^{3,4,5}						
1977	6.2	4.1	3.1	2.6	2.1	3.0
1981	7.2	4.8	3.5	2.8	2.2	3.3
1986	9.1	6.4	4.2	3.3	2.4	3.9
1991	9.8	6.3	4.2	3.0	1.7	3.4
1996/97	5.6	4.3	3.4	2.7	1.8	2.8
2001/02	7.3	4.8	3.8	2.9	1.8	3.0
2006/07	5.7	4.0	3.5	2.7	1.7	2.8
Total direct taxes						
1977	17.6	20.0	22.4	24.4	24.4	22.9
1981	13.5	17.1	21.4	23.3	24.2	21.8
1986	13.4	15.5	19.7	22.8	24.1	21.3
1991	13.5	14.8	17.9	20.1	21.8	19.5
1996/97	10.2	12.9	17.6	20.6	23.4	19.8
2001/02	11.6	14.1	18.1	21.3	24.0	20.7
2006/07	10.9	13.5	18.5	22.2	24.8	21.0

Notes:

- Households are ranked by equivalised disposable income.
- Includes mortgage interest relief at source (MIRAS) and tax credits from 2003/04 onwards – see technical note 1.
- Includes domestic rates until 1990, community charge between 1989 and 1992, and council tax from 1993/94 onwards.
- There is a discontinuity in this series between 1995/96 and 1996/97 associated with the treatment of council tax benefit. See technical note 4 for more details.
- There is a discontinuity in this series between 2001/02 and 2002/03 associated with the treatment of water charges. See technical note 2 for more details.

Changes in payments of national insurance contributions and local taxes had less impact on the proportion of gross income paid in direct tax by each quintile group.

The result of changes in the distribution of gross income, combined with these changes in the proportion of gross income paid in direct tax, was that, over the period between 1977 and the mid-1990s, the proportion of total direct taxes paid by the

top quintile group increased significantly, while that paid by the other four quintile groups declined (Figure 11). These proportions remained relatively constant from the mid-1990s onwards.

The effect of direct taxes on the income distribution

The overall impact of direct taxes on the income distribution can be illustrated by a comparison of the distributions of

equivalised gross and disposable income, that is, income before and after payment of direct taxes (Figure 12). The progressive nature of direct taxes is clear. The income shares for the bottom and second quintile groups increase after taxation, while that for the top quintile group declines. It can be seen that the direct tax cuts of the late 1980s reduced this progressive effect of direct taxes, while the direct tax rises of the early 1990s had the opposite effect.

The impact of changes in the overall rate of direct taxation paid by each quintile group was small, compared with the impact of increased inequality of gross income. From 1992 onwards, direct taxes reduced the income share of the top quintile group by an average of 2.1 percentage points, compared with an average of 1.4 percentage points before 1992. Over the same periods, the income shares of the second and third quintile groups were very slightly greater due to these changes in the impact of direct taxes. There was no major change in the impact of direct taxes between 1996/97 and 2006/07.

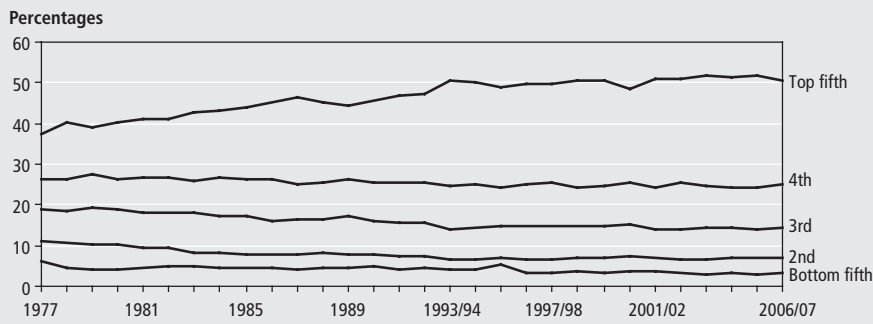
Taking into account the increase in inequality of gross income during this period, it becomes clear why the changes in tax rates described above had a relatively small effect on the income distribution. Between 1977 and 1996/97, real equivalised gross income of the bottom quintile group increased by 16 per cent, compared with 80 per cent for the top quintile group. In this context, the fact that direct taxes for the bottom quintile group fell more than those for the top quintile group (from 18 to 10 per cent compared with 24 to 23 per cent) made relatively little difference. While direct taxes did reduce income inequality slightly more from the mid-1990s onwards, changes in the distribution of gross income were much more important in explaining changes to the distribution of disposable income.

Indirect taxation

While most analyses of the income distribution are based on the distribution of disposable income, the ROI analysis additionally includes assessments of the impact of indirect taxes and benefits in kind on household income. Indirect taxes are those incurred by households when they purchase goods and services. Indirect taxes also include an estimate for payment of intermediate taxes, that is, indirect taxes incurred by businesses which are deemed to be passed onto consumers through the prices that they pay for goods and services.

Overall, indirect taxes account for

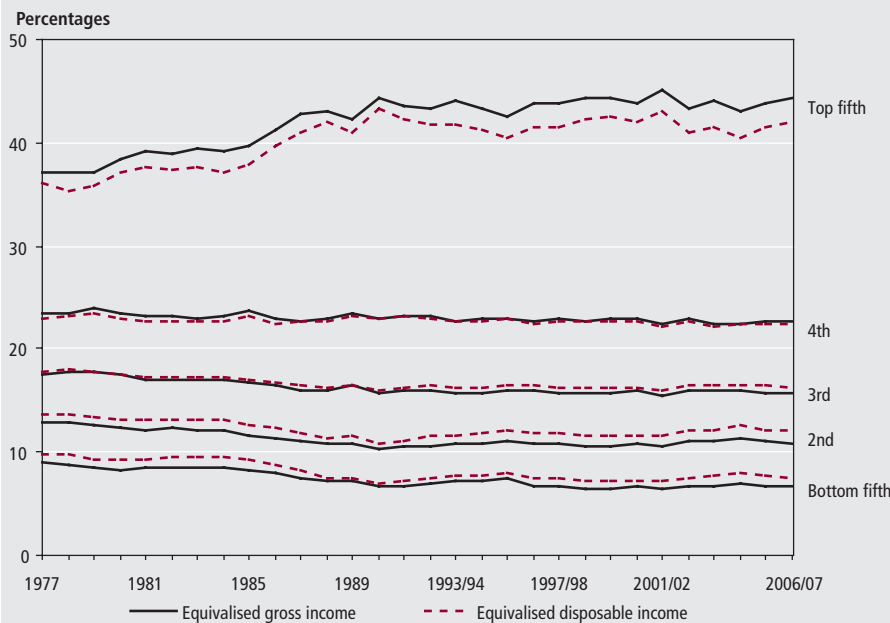
Figure 11
Shares of total direct tax payment by quintile group¹



Note:

1 Households are ranked by equivalised disposable income.

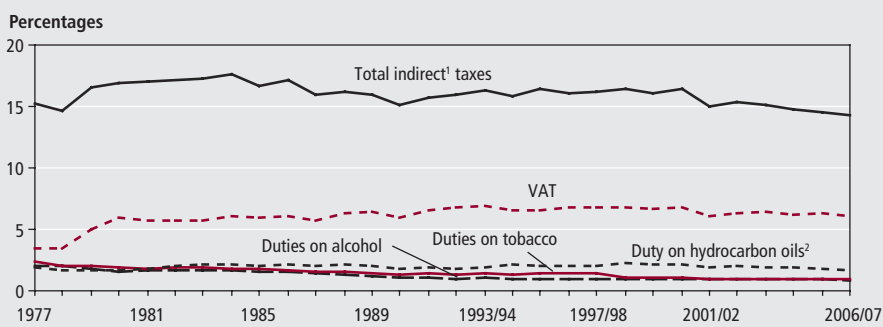
Figure 12
Shares of total gross and disposable income by quintile group¹



Note:

1 Households are ranked by equivalised disposable income.

Figure 13
Indirect taxes as a percentage of gross income



Notes:

- 1 Includes intermediate taxes – indirect taxes paid by businesses which are deemed to be passed onto consumers through the prices they pay for goods and services.
- 2 Includes vehicle taxes.

a slightly smaller proportion of gross household income than direct taxes. After the increase in the rate of VAT in 1979, indirect taxes accounted for around 17 per cent of gross household income, declining slightly to around 16 per cent in the late 1980s and remaining at a similar level during the 1990s (Figure 13).

In the early 2000s, estimates of indirect tax as a proportion of income fell further. The sudden fall in 2001/02 may be explained by a discontinuity introduced by the move from the FES to the EFS, when it appears there was a change in the relationship between estimates of income and expenditure. This change is described in more detail in technical note 3. However, in the years after 2001/02, for which estimates should be comparable, indirect taxes as a proportion of gross income continued to decline. Falls in duty payments on tobacco, alcohol, hydrocarbon oils and vehicle taxes all contributed to this decline.

VAT is the largest indirect tax and, in 2006/07, payments of VAT accounted for 6 per cent of gross household income. Payments of VAT increased after a new unified rate of 15 per cent was introduced in 1979, replacing the previous standard and higher rates of 8 and 12.5 per cent. The burden of VAT increased further in 1991 when the standard rate was increased to 17.5 per cent.

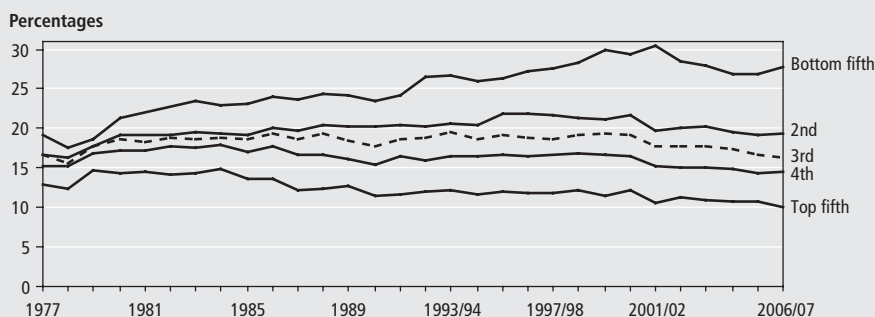
Between 1977 and 2006/07, payments of duties on tobacco gradually decreased from about 2 per cent of gross income to around 1 per cent. This decline was due to the fact that total consumption of tobacco fell by more than half over this period.

Duties on alcohol also declined as a proportion of household income over the same period, similarly from about 2 to 1 per cent. However, this fall was due to the fact that duties on alcohol have risen much more slowly than the prices of alcoholic drinks, and even more slowly than average incomes. In fact, the decline in the burden of alcohol duties would have been much greater were it not for the large increase in the volume of consumption of alcoholic drinks, which more than doubled between 1977 and 2006/07.

Duty on hydrocarbon oils and vehicle taxes accounted for approximately 2 per cent of gross income throughout this period, with duty on hydrocarbon oils accounting for the majority of this. Between 1998/99 and 2006/07, these duties fell from 2.3 per cent of gross income to 1.7 per cent, largely due to the demise of the fuel duty escalator in 2000.

Other indirect taxes included in the

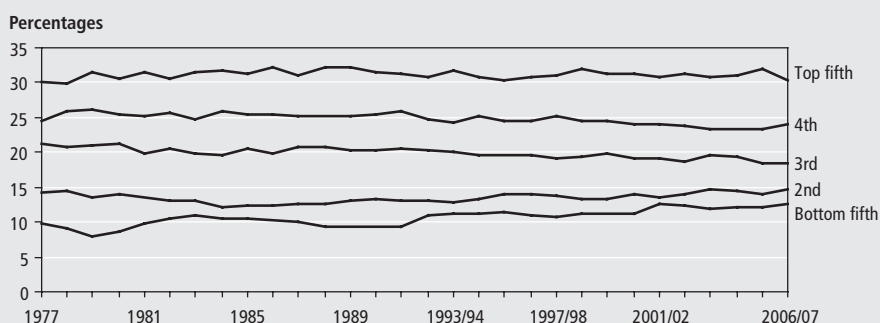
Figure 14
Indirect taxes as a percentage of gross income by quintile group¹



Note:

1 Households are ranked by equivalised disposable income.

Figure 15
Shares of total indirect tax payment by quintile group¹



Note:

1 Households are ranked by equivalised disposable income.

analysis are the TV licence, betting taxes, customs duties, stamp duty (all owner-occupier households are assigned a notional stamp duty liability), and intermediate taxes.

Indirect taxes by quintile group

In contrast to direct taxes, the overall impact of indirect tax is regressive, meaning that low-income households pay a higher proportion of their gross income in indirect taxes, compared with high-income households (Figure 14). In addition, the proportion of gross income paid in indirect taxes by low-income households has increased over the last 30 years, while that for high-income households has fallen.

Indirect taxes had an increasingly regressive effect because, while the distribution of gross and disposable income became more unequal, the proportions of total indirect tax paid by each quintile group changed much less, with the bottom quintile group actually paying a slightly increased share of total indirect tax (Figure 15).

The proportion of total indirect tax paid by the bottom quintile group increased partly due to a decline in the proportion of retired households in the bottom quintile group (Jones *et al* 2008). The non-

retired households which replaced them at the bottom of the income distribution would generally have had much higher expenditure, and therefore paid more indirect tax.

Households in the bottom quintile group paid an increasing proportion of VAT. They also paid higher proportions of total duties on alcohol, hydrocarbon oils and tobacco. In the case of alcohol and hydrocarbon oils, this was due to faster growth in consumption of these goods by households in the bottom quintile group, compared with those in higher quintile groups. In the case of tobacco, it was a due to a slower decline in consumption.

The proportion of total indirect tax paid by the top quintile group remained effectively unchanged. While the disposable incomes of these households increased, their expenditure did not increase as rapidly, and fell as a proportion of disposable income. In 1978, average expenditure by the top quintile group represented 85 per cent of disposable income compared with 73 per cent in 2006 (households ranked by unequivalised gross income – see also technical note 3). Households in the top quintile group also paid a declining proportion of total duties.

During the 1980s and 1990s, inequality of total expenditure increased less than inequality of income (Goodman and Oldfield 2004). This also helps to explain why payment of indirect taxes did not become more unequal. Goodman and Oldfield suggested several reasons why expenditure inequality increased less than income inequality including increased volatility of income over time for some households, and the increased use of credit to smooth expenditure over time.

Increased inequality of income also meant that payments of indirect tax represented a higher proportion of gross income for low-income households compared with high-income households, for example payments of VAT (Table 2). The burden of alcohol and tobacco duties fell much more slowly for low-income households while duties on hydrocarbon oil and vehicle taxes also became more regressive in their effect. Estimates of indirect tax as a proportion of gross income for the bottom quintile are affected by households for which expenditure exceeds disposable income – see technical note 7.

In the late 1970s and early 1980s, duties on alcohol were actually a progressive form of taxation – they accounted for a higher proportion of gross income for high-income households than for low-income households. Since the mid-1980s, duties on alcohol have been regressive, and gradually became more regressive.

The effect of indirect taxes on the income distribution

Like direct taxes, the impact of indirect taxes can be illustrated by comparing the distribution of equivalised disposable and post-tax income (Figure 16). This shows that, throughout the period, indirect taxes increased income inequality, and that, between 1977 and the early 1990s, they became a little more regressive in their impact. Between the early 1990s and 2006/07, their impact was relatively unchanged.

At the end of the 1970s, as a result of indirect taxes, the income share of the top quintile group increased by about 1 percentage point. This effect gradually increased and, from the early 1990s onwards, indirect taxes increased the income share of the top quintile group by at least 2 percentage points. Indirect taxes had no effect on the income share of the lower two quintile groups in the late 1970s, but from the early 1990s onwards indirect taxes reduced the income share of the bottom quintile group by about 1 percentage point,

Table 2
Indirect taxes as a percentage of gross income by quintile group

	Income quintile groups of all households ¹					Percentages
	Bottom	2nd	3rd	4th	Top	All households
VAT						
1977	3.9	3.6	3.8	3.6	3.3	3.5
1981	6.4	5.9	5.9	5.8	5.3	5.7
1986	7.3	6.4	6.7	6.4	5.4	6.1
1991	8.2	7.5	7.4	6.9	5.3	6.5
1996/97	10.2	8.4	7.7	7.0	5.5	6.8
2001/02	11.5	7.5	7.0	6.3	4.7	6.1
2006/07	11.0	7.6	6.7	6.3	4.5	6.1
Duty on alcohol						
1977	1.8	1.7	2.1	2.1	2.0	2.0
1981	1.5	1.5	1.7	1.8	1.6	1.7
1986	1.7	1.6	1.7	1.7	1.4	1.5
1991	1.3	1.3	1.2	1.2	0.8	1.1
1996/97	1.3	1.3	1.1	1.0	0.7	0.9
2001/02	1.6	1.0	1.0	0.9	0.6	0.9
2006/07	1.3	0.9	0.9	0.8	0.5	0.8
Duty on tobacco						
1977	4.1	3.3	2.9	2.3	1.5	2.4
1981	3.6	2.7	2.4	1.8	1.0	1.8
1986	4.3	3.1	2.2	1.7	0.8	1.7
1991	3.9	2.8	1.9	1.3	0.5	1.4
1996/97	4.1	2.9	1.8	1.2	0.5	1.4
2001/02	3.1	1.8	1.6	0.9	0.3	1.0
2006/07	2.5	2.0	1.2	0.8	0.3	0.9
Duty on hydrocarbon oils and vehicle taxes						
1977	1.8	1.9	2.1	2.0	1.7	1.9
1981	1.8	1.8	2.0	2.0	1.7	1.8
1986	2.1	2.1	2.5	2.3	1.8	2.1
1991	2.3	2.2	2.4	2.2	1.4	1.9
1996/97	2.7	2.4	2.4	2.2	1.5	2.0
2001/02	3.4	2.4	2.4	2.1	1.3	1.9
2006/07	3.0	2.3	2.1	1.9	1.2	1.7
Other indirect taxes						
1977	1.4	1.1	1.0	0.9	0.7	0.9
1981	1.6	1.3	1.1	1.0	0.8	1.0
1986	2.2	1.7	1.4	1.3	0.8	1.2
1991	2.1	1.6	1.3	0.9	0.6	1.0
1996/97	2.8	2.1	1.7	1.3	0.8	1.4
2001/02	2.9	2.0	1.7	1.3	0.9	1.4
2006/07	2.7	1.9	1.5	1.4	1.1	1.4
Intermediate taxes²						
1977	6.1	5.0	4.8	4.4	3.8	4.5
1981	7.3	5.9	5.3	4.8	4.2	5.0
1986	6.5	5.3	4.9	4.3	3.5	4.4
1991	6.4	5.1	4.6	3.9	3.0	3.9
1996/97	6.1	4.8	4.2	3.6	2.8	3.7
2001/02	8.0	5.1	4.2	3.7	2.7	3.7
2006/07	7.2	4.7	3.9	3.3	2.4	3.4
All indirect taxes						
1977	19.2	16.7	16.7	15.2	12.9	15.2
1981	22.1	19.1	18.2	17.2	14.5	17.0
1986	24.0	20.1	19.3	17.7	13.7	17.1
1991	24.2	20.4	18.7	16.4	11.7	15.7
1996/97	27.2	21.9	18.9	16.4	11.8	16.1
2001/02	30.4	19.8	17.8	15.2	10.5	15.0
2006/07	27.8	19.4	16.3	14.5	10.1	14.3

Notes:

- Households are ranked by equivalised disposable income.
- Indirect taxes paid by businesses which are deemed to be passed onto consumers through the prices they pay for goods and services.

and the second quintile group by about 0.5 percentage points. Between the early 1990s and 2006/07, the effect of indirect taxes on the income distribution remained relatively stable.

The combined impact of direct and indirect taxes

The combined impact of direct and indirect taxes can be seen by comparing the distributions of equivalised gross and post-tax income (Figure 17). Direct taxes reduce income inequality and their impact became a little stronger over the period between 1977 and the mid-1990s, remaining fairly constant thereafter. Indirect taxes increase income inequality, and their impact became slightly stronger between 1977 and the early 1990s, then remained relatively constant. So, direct and indirect taxes had opposite impacts, and even the ways in which those impacts changed over time largely cancelled each other out. The distribution of post-tax income was remarkably similar to the distribution of gross income over the last 30 years.

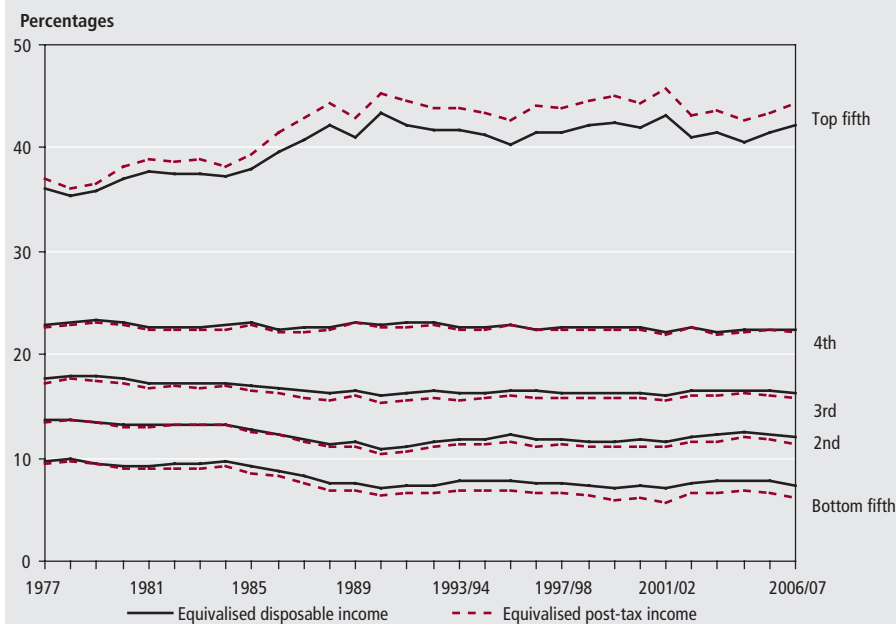
Benefits in kind

The final step in the ROI analysis is to estimate the value to households of services provided by the state either free or subsidised at the point of use. By far the most important services for which imputations are made are health and education services. Households are assigned nominal income to reflect their use of these services, based on the estimated cost of provision. So, for example, households with children in state education or students in universities are assigned a benefit in kind from the education service. All households are assigned a benefit in kind from the NHS, which is intended to reflect expected (rather than actual) use of NHS services, based on the age and sex characteristics of household members.

The estimation of these benefits in kind is based on limited information, and takes no account of changes in public sector productivity. As such they provide a broad indication of the way in which households in different parts of the income distribution are beneficiaries of government spending on these services, but are not an accurate measure of their real value to households.

The value of the NHS benefit increased more rapidly in real terms than that for education (Figure 18), reflecting real terms increases in government spending on the NHS, particularly since 2000. In 1977, the NHS and education benefits

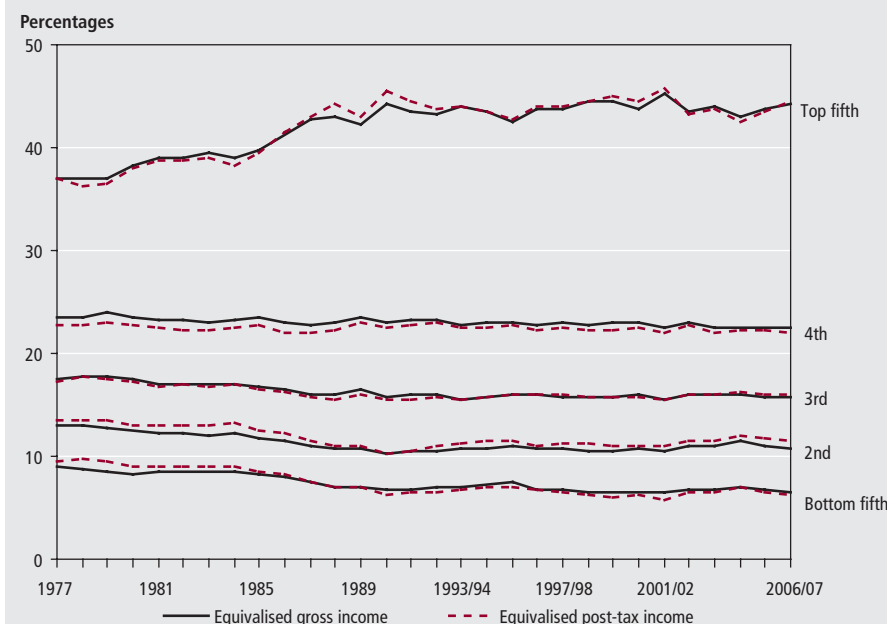
Figure 16
Shares of total disposable and post-tax income by quintile group¹



Note:

1 Households are ranked by equivalised disposable income.

Figure 17
Shares of total gross and post-tax income by quintile group¹



Note:

1 Households are ranked by equivalised disposable income.

each represented about 10 per cent of post-tax income on average. By 2006/07, the NHS benefit represented 15 per cent of post-tax income, compared with 9 per cent for the education benefit. Subsidy of public transport services is also allocated to households based on assumptions about the use of public transport. The real value of this subsidy has declined over this period. Public subsidy of social housing also fell in the early 1980s as government policy moved

away from subsidising rents directly. This coincided with the introduction of housing benefit through which payments were made directly to tenants, recorded in this analysis as part of cash benefits.

While the NHS benefit has increased, the way in which it is allocated across the income distribution has changed very little (Table 3). The lower two quintile groups receive between 22 and 24 per cent of the total NHS benefit, the third quintile group

about 20 per cent, the fourth 18 per cent and the top about 15 per cent.

The NHS benefit is estimated based on assumptions about the expected cost of providing health care to people of a given age and sex. The imputed benefit is highest for retired households, particularly where members of the household are above the age of 75. It is also higher for households with children. While there has been a decrease in the number of retired households in the bottom quintile group, their place has been taken, at least in part, by households with children. So this change in the composition of the income distribution had relatively little impact upon the way in which the NHS benefit was allocated across the income distribution.

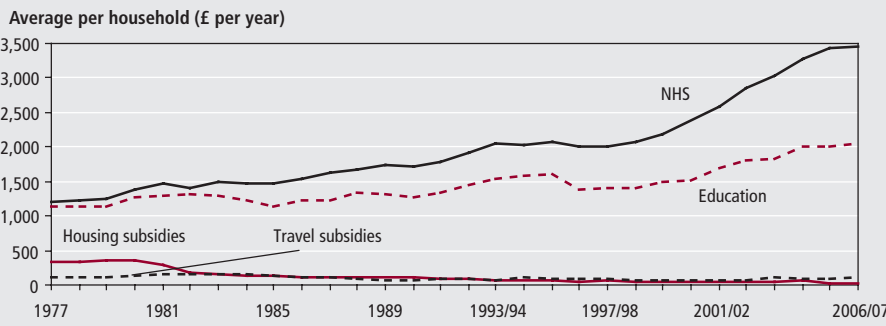
The education benefit is allocated to households based on the number of children receiving state education in either special schools, or primary or secondary schools, and the number of students studying at universities. It is calculated based on the estimated cost per pupil (or student) of providing these services. The allocation of the education benefit reflects the position of children and university students within the income distribution. With the increase in the proportion of children in the bottom quintile group between 1977 and the mid-1990s, the education benefit was gradually directed more towards this part of the income distribution.

The ROI analysis does not calculate equivalised final income as equivalisation is not appropriate for nominal income from benefits in kind. However, an indication of the impact of benefits in kind is provided by a comparison of the shares of unequivalised post-tax and final income (Table 3). Benefits in kind appear to have slightly more of an equalising effect than was the case in the past. In 1977, benefits in kind increased the income share of the bottom quintile by 2.7 percentage points, while in 2006/07 they increased it by 4.1 percentage points. Conversely, in 1977, benefits in kind reduced the income share of the top quintile group by 4.3 percentage points, while in 2006/07 they reduced it by 6 percentage points.

Conclusion

The effect of each stage of redistribution on the Gini coefficient provides a useful summary indicator of the effect on the income distribution. Figure 19 shows the change in the Gini coefficient after each successive stage of redistribution (excluding

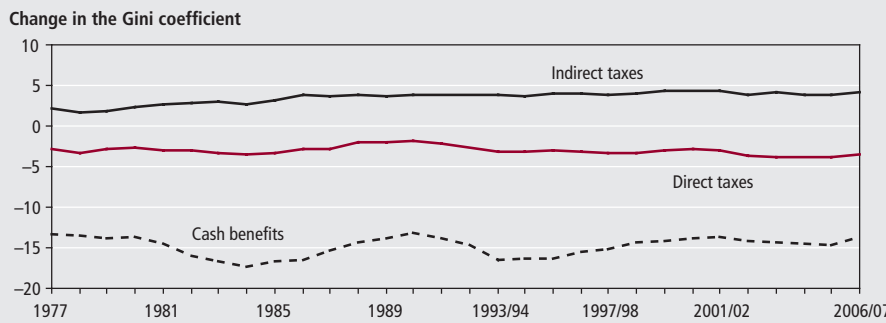
Figure 18
Income¹ from benefits in kind in 2006/07 prices



Note:

1 Nominal income assigned to households to reflect their use of services provided by the state either free or subsidised at the point of use.

Figure 19
Changes in the Gini coefficient¹ after each stage of redistribution



Note:

1 See technical note 6 for an explanation of the Gini coefficient.

the final stage, final income, for which no Gini coefficient is calculated).

Cash benefits have the largest impact on income inequality, reducing the Gini coefficient substantially. Their effect on inequality varied over time, mainly due to economic cycles, but there is no evidence of any underlying change in their impact on inequality over the last 30 years. Apart from cyclical variations, cash benefits contributed a similar proportion of total gross household income, and continued to go predominantly to low income households.

Direct taxes are generally progressive and so reduce income inequality, although less than cash benefits. On average, they reduced inequality slightly more from the mid-1990s onwards compared with earlier years. Indirect taxes tend to be regressive and so they increase income inequality. The extent to which they increased inequality grew between 1977 and the start of the 1990s, remaining relatively stable thereafter. Over the last 30 years, direct and indirect taxes had opposite effects on income inequality, which tended to cancel each other out. Therefore, the tax system as a whole played a relatively small role in changes to post-tax income inequality over this period.

Datasets

The data appearing in figures and tables in this article, and also the underlying datasets upon which the analysis is based, are available for download from www.statistics.gov.uk/statbase/product.asp?vlnk=10336

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Office for National Statistics 'The effects of taxes and benefits on household income' at www.statistics.gov.uk/statbase/product.asp?vlnk=10336

Jones F, Annan D and Shah S (2008) 'The distribution of household income 1977 to 2006/07', *Economic & Labour Market Review* 2(12), pp 18–31 and at www.statistics.gov.uk/cci/article.asp?id=2082

TECHNICAL NOTE

- When they were introduced in 2003/04, the new child tax credit and working tax credit were treated as negative income tax, but only to the extent that income tax less tax credits remained greater than or equal to zero for each family. So, for households paying relatively little or no income tax, tax credit payments are still regarded either partially or wholly, as cash benefits.
- Until 2001/02, the ROI analysis treated water charges as a local tax, whereas from 2002/03 they were regarded as expenditure. This change updated the analysis to reflect the water privatisation that had taken place in 1989. The effect of this change was to reduce the direct tax burden by approximately 0.8 percentage points, which contributed to the fall in the estimated tax burden in 2002/03.
- From 2001/02, the Expenditure and Food Survey (EFS) replaced the Family Expenditure Survey (FES). The ratio between income and expenditure appeared to change from 2001/02 onwards. In the final years of the FES, average expenditure was equal to approximately 95 per cent of disposable income. In the period immediately following the introduction of the EFS, this figure was around 90 per cent. This change in the underlying relationship between income and expenditure in the survey meant that estimates of indirect tax (which are based on expenditure data) were lower when expressed as

Table 3
Shares of post-tax income, imputed income from benefits in kind and final income by quintile group

	Income quintile groups of all households ¹					All households	Percentages
	Bottom	2nd	3rd	4th	Top		Average per household (£ per year, 2006/07 prices)
Post-tax income²							
1977	7.9	13.2	19.1	24.0	35.8	100	11,749
1981	8.0	12.6	18.2	24.2	37.0	100	12,989
1986	7.4	11.0	17.4	23.8	40.4	100	13,944
1991	5.8	10.1	16.8	24.3	43.0	100	16,932
1996/97	6.4	10.6	16.5	23.7	42.8	100	16,875
2001/02	5.6	10.5	16.0	23.4	44.5	100	20,480
2006/07	6.2	11.1	16.2	23.1	43.4	100	22,420
National Health Service							
1977	23.0	22.1	21.2	18.4	15.3	100	1,193
1981	23.8	22.8	20.0	18.5	14.9	100	1,469
1986	23.8	22.1	20.6	17.9	15.5	100	1,535
1991	23.7	22.7	20.6	18.0	15.0	100	1,794
1996/97	23.7	22.8	20.8	17.5	15.2	100	2,013
2001/02	23.6	23.2	19.8	18.2	15.2	100	2,595
2006/07	22.6	23.7	20.6	17.9	15.3	100	3,462
Education							
1977	19.0	22.9	26.6	19.2	12.2	100	1,144
1981	22.4	22.7	25.1	19.1	10.7	100	1,293
1986	23.0	19.4	25.7	19.1	12.8	100	1,234
1991	23.6	19.4	25.7	19.3	12.0	100	1,331
1996/97	29.7	21.2	20.6	17.6	10.8	100	1,387
2001/02	29.2	21.1	21.4	18.3	10.0	100	1,699
2006/07	32.9	21.1	20.1	15.9	10.0	100	2,042
Other benefits in kind							
1977	22.9	22.3	20.7	19.1	15.0	100	582
1981	25.6	23.6	19.0	18.5	13.1	100	512
1986	30.3	24.4	17.7	13.8	13.9	100	298
1991	32.7	25.1	16.1	12.8	13.3	100	222
1996/97	29.1	22.1	15.6	13.0	20.2	100	181
2001/02	33.4	24.9	15.4	12.6	13.7	100	142
2006/07	28.0	20.7	17.2	15.5	18.6	100	149
Total benefits in kind							
1977	21.4	22.5	23.2	18.8	14.0	100	2,923
1981	23.5	22.9	21.9	18.7	13.0	100	3,274
1986	24.1	21.3	22.4	18.0	14.3	100	3,064
1991	24.3	21.5	22.3	18.2	13.7	100	3,347
1996/97	26.3	22.1	20.5	17.3	13.8	100	3,581
2001/02	26.0	22.5	20.3	18.1	13.2	100	4,438
2006/07	26.5	22.7	20.3	17.1	13.4	100	5,651
Total final income²							
1977	10.6	15.1	19.9	23.0	31.5	100	14,672
1981	11.1	14.7	19.0	23.1	32.2	100	16,261
1986	10.4	12.8	18.3	22.7	35.7	100	17,009
1991	8.8	12.0	17.7	23.3	38.2	100	20,278
1996/97	9.9	12.6	17.2	22.6	37.7	100	20,456
2001/02	9.2	12.7	16.8	22.4	38.9	100	24,918
2006/07	10.3	13.4	17.0	21.9	37.3	100	28,071

Notes:

- Households are ranked by equivalised disposable income.
- Unequalised.

a proportion of income, by around 1 percentage point. It appears that at least part of the fall in estimates of indirect tax as a percentage of gross income in 2001/02 was caused by the transition from the FES to the EFS.

- Until 1995/96, rates rebates, community charge benefit and subsequently council tax benefit were treated as housing benefits. From 1996/97 onwards, council tax benefit was treated as a negative tax and deducted from council tax

payments. The effect of this change was to reduce the estimated tax burden by approximately 0.3 percentage points.

- Over the period between 1977 and 2006/07, average household size declined from 2.8 people per household to 2.4 people per household. Whereas equalised incomes are adjusted to take account of changes in household size and composition, a fall in average household size will reduce growth in average unequalised household incomes. For example, average equalised disposable income grew 109 per cent in real terms between 1977 and 2006/07, whereas average unequalised disposable income increased by 87 per cent.
- The Gini coefficient is a measure of income inequality taking values between 0 and 100, with higher values denoting higher levels of inequality. A value of 0 indicates complete equality in the distribution of household income (all households have the same equalised income). A value of 100 indicates complete inequality (one household has all the income and the others have none). For further details see www.statistics.gov.uk/about/methodology_by_theme/gini/default.asp.
- The deduction of indirect tax from disposable income to estimate post-tax income seems quite natural where household expenditure is less than disposable income, since indirect tax can be thought of as having been paid out of disposable income. However, for some households, in the bottom quintile group in particular, measured expenditure can be greater than measured income, sometimes by a wide margin. Where this reflects the real circumstances of the household (as opposed to measurement error), expenditure (and the payment of indirect taxes) are being funded, at least in part, by means other than disposable income, for example credit or savings. Estimates of indirect tax as a proportion of gross income for the bottom quintile are high, partly due to households for which expenditure exceeds income.
- From 1996/97, ROI estimates are based on a sample weighted to adjust for differential rates of non-response. Prior to this date, estimates were based on an unweighted sample of responding households.
- Company cars were included in the ROI definition of income from 1990. The effect of this change was to increase the Gini coefficient for equalised disposable income by 0.5 percentage points (based on data for 1990).