THE DISTRIBUTION OF PUBLIC EXPENDITURES AND TAXES AMONG HOUSEHOLDS IN THE UNITED KINGDOM*

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This paper presents an analysis of the distributive impact of public expenditures and taxes in the United Kingdom. The analysis uses household level microdata from the 1971 Family Expenditure Survey, with tax and expenditure aggregates drawn from the national accounts.

The analysis is the first to allocate all taxes and public expenditures for the United Kingdom, and the results are compared to those from the more restricted analyses carried out by the U.K. Central Statistical Office. Results are presented for individual taxes and benefits as well as for overall net benefits and they describe distributional effects with respect to income class, household size, number of earners and housing tenure.

A final section of the paper compares the results to those from a similar analysis for the United States which were reported in the previous issue of this review.

1. INTRODUCTION

Empirical studies of the distributive impact of taxation and public expenditure in the United Kingdom have been dominated by the work of the U.K. Central Statistical Office (CSO). Their analyses generally avoid allocating those taxes and expenditures where methodological uncertainties exist about their incidence, so that about one-third of government revenue and over one half of expenditures are excluded from their estimates. As an official government agency, the CSO may feel that it would be inappropriate to appear to be "taking sides" in unresolved methodological disputes, but the effect of their reticence is to leave a significant gap in the information available about the distributional effects of public policy. For example, a full account of the redistributive impact of a shift in the balance of taxation (e.g. from direct or indirect taxes) or of public expenditures (e.g. from social services to defence and protective services) is not possible under these circumstances.

In the United States, however, most analyses since Gillespie (1965) have allocated all government expenditures (and/or taxes), using alternative

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assumptions where necessary in order to allow for the empirical differences implied by theoretical disputes.

In a paper in the previous issue of this Review (Ruggles and O'Higgins, 1981) we commented on these differences in the pattern of studies as between the U.S. and the U.K., outlined a methodology whereby we intended to arrive at comparable estimates of the distribution of total public expenditures in both countries using household-level microdata files, and presented results for the United States on the distribution of public expenditures and net benefits by a variety of characteristics. This paper presents and discusses the results for the United Kingdom and compares them to those for the United States.

Given the dominance of the CSO work in the U.K. and the fact that this analysis is the first major independent extension of that work, it seems useful to set out clearly the ways in which we expand upon the CSO analyses. Since the CSO routinely use household-level data in their allocation procedures, we have generally accepted their allocations (which were available on our datatape) as far as they went, although in the case of employers' national insurance contributions we present the results of using an alternative incidence assumption. Our results extend the CSO analyses in three ways.

First, we have increased the range and magnitude of taxes and benefits which are specifically allocated, both by allocating further current expenditures and taxes where available information allowed reasonable incidence assumptions to be modeled and by allocating capital taxes and part of capital expenditure on certain items where we have made specific allocations of current expenditure. This assumes that existing beneficiaries from current expenditure on certain services are a representative cross-section of the characteristics of those who will use the services resulting from this capital expenditure; this appears to us to be a reasonable assumption.

Second, we have used three alternative assumptions to allocate the unallocable public expenditures.[1] This allows us both to compare the empirical differences among the assumptions and to have a series of total expenditure allocation figures against which the CSO total of allocated expenditures can be compared. Third, we have taken advantage of our access to microdata to examine the distributional effects of taxes and expenditures with respect to important household characteristics generally ignored in the conventional analyses.

Space limitations prevent the presentation of results using an extensive set of other characteristics, but we discuss distributional impacts with respect to the number of workers in and the housing tenure of the household.

As compared to our previous paper on the U.S., we devote more attention to the tax-side results here, since they represent the first application of our allocation assumptions, which increase allocated taxes by about one quarter, to the U.K.

[1]It may appear paradoxical to speak of allocating the unallocable; however, we believe that with better information, further specific allocation routines could be developed on the expenditure side. To have used the most obvious alternative description of the "unallocables"—pure public goods—could therefore have been misleading. We deemed paradox to be preferable.

2. The Allocation of Public Expenditure and Taxes in the U.K.

The allocation to individual households of the benefits of public expenditure requires a clear specification of what the benefits are presumed to be. They may be seen as either the gratification derived by each household from the expenditure, or as a measurement of the cost of the resources being used in the interests of or on behalf of that household. The former approach, resting upon the concept of a household utility function, has traditionally had the theoretical allegiance of economists, even if much of their empirical work has drawn upon either assumption, as convenient. The utility approach presents difficulties, however, with respect to expenditures both on welfare or merit goods such as public assistance or health care, and on such traditional pure public goods as national defence.

If one were to follow strictly the utility approach to measuring, for example, the benefits of public assistance expenditures, one should measure the extent to which the utility of the recipient of public assistance is increased by less than the monetary value of the assistance because of the requirement to tolerate occasional or persistent investigation into his or her private life. Similarly, one might measure any extra utility resulting from the fact that the money is received without having to work.

The utility approach is even more problematic when applied to pure public goods. Since, by definition, these expenditures are not specifically allocable, the analyst must seek an allocation routine (or several of them) to correspond to one (or several) specific assumptions about the population utility function. It may turn out that a chosen utility function translates easily into a specific allocation routine, such as allocation in proportion to total income. However, no such utility function is likely to fulfil the requirements of a claim that public expenditure benefits are being allocated to individual households according to the utility which each derives from the expenditure. To take an obvious example, while some people may derive massive consumer surplus from particular expenditures on defence, others will obtain little or no utility, or may feel disutility from those expenditures. Furthermore, a change in the degree of international tension will also change both the average amount and distribution of utility from defence expenditure.

If utility were measurable, measures of the magnitude and distribution of the utility benefits of public expenditure would be both interesting and important. Since it is not measurable, however, an analysis of the redistribution of income based on assumptions about utility benefits will contain some contradictions. For specific expenditures (such as social security, health services) what is generally measured is the resource cost of services to their recipients or users, rather than the utility which people receive; and, for pure public goods, aggregate assumptions are adopted which have, at best, only a passing relationship to the disaggregate phenomena which they seek to measure.

The alternative method, which we pursue here, neither seeks nor claims to measure utility. It is based on the attempt to identify the users of a service or those on behalf of whom each expenditure was made, and to allocate to such users or intended beneficiaries the value of the resources used in providing the

service (i.e. the opportunity cost of the service). In other words, we measure by actual use where possible and intended use otherwise. Since we do not seek to measure the value placed by the user or recipient on any public service, but merely to know the cost of the resources involved, we can place our analysis firmly in the framework of the national accounts which we believe to be an important advantage. Thus, for example, our approach means that we allocate the costs of administering social security to its recipients, while allocating defence spending on a variety of assumptions designed to reflect the various factors which such expenditure may be identified as intended to protect—persons, incomes and property.

These premises allow a consistent derivation of allocation routines which serve to indicate the distributional impacts of public expenditure and taxation within the framework of the national accounts. The specific assumptions and routines we use are detailed in the appendix to this paper.

3. Allocation and the U.K. National Accounts

While this allocation exercise is carried out within the framework of the national accounts, the particular totals for public revenue and expenditure in the national accounts will not, we argued in the previous paper, necessarily be the appropriate starting point for an analysis of the distributional impact of public finance. This point is illustrated for the U.K. by the data in Table 1 which give a breakdown of the 1971 revenue and expenditure totals of £23,451 million.

Just over £4,000 million (or 17 percent of total expenditure) has been excluded from our assessment of the expenditure total relevant to a redistributional analysis. As in the U.S. study, debt interest (which is a factor return to lenders) and net lending by the government have been excluded. The remainder of the expenditure excluded consists of non-trading capital consumption which has an imputed accounting identity on the revenue side and that part of government expenditure which goes abroad. In general, where such expenditure is to the benefit of non-residents it should not be allocated in an exercise which, as discussed above, allocates benefits to the U.K. household sector on the basis of the use or intended benefit of the service. However, expenditure abroad for defence and external relations purposes may reasonably be argued to be a necessary part of these pure public goods and is therefore included in our relevant expenditure total.

On the revenue side our analysis is confined to tax revenue paid by U.K. residents, which for 1971 amounts to just under £19 billion, or about 2 percent less than the relevant expenditure total. Since, as discussed in the previous article, government expenditure beneficial to residents need not equal the taxes paid by those residents in any one year, we have not attempted to equalize the tax revenue and relevant expenditure figures.

Table 1 shows that almost two-thirds of relevant expenditure is allocated using specific routines, as compared to a little under half in the CSO procedures. This increase has been brought about by marginal increases in the amounts of health, education and social security expenditures allocated, by significant increases for housing and employment services and by the introduction of

TABLE 1

U.K. GENERAL GOVERNMENT EXPENDITURE AND REVENUE 1971

Allocable Expenditure	Our Allocations £m.	Our Allocations %	CSO Allocations £m.	CSO Allocations %	Allocable Taxes	Our Allocations £m.	Our Allocations %	CSO Allocations £m.	CSO Allocations %
Social Security	4,281	22.1	4,069	21.0	Income Tax & Surtax	6,370	33.6	6,370	33.6
Education	2,664	13.7	2,430	12.5	Employees National Insurance	1,373	7.2	1,373	7.2
Health	2,150	11.1	2,054	10.6	Employers National Insurance	1,124	5.9	591	3.1
Housing	725	3.7	332	1.7	Corporation Tax	1,339	7.1	—	—
Roads & Public Lighting	579	3.0	—	—	Capital Taxes	568	3.0	—	—
Water Supply & Refuse Disposal	334	1.7	—	—	Domestic Rates	952	5.0	952	5.0
Employment Services & Premiums	298	1.5	76	0.4	Commercial Rates	1,134	6.0		
Personal Social Services	112	0.6	—	—	Expenditure Taxes	5,355	28.2	5,795	30.5
School Meals, Milk & Welfare Foods	159	0.8	159	0.8	Selective Employment Tax	666	3.5		
Agriculture	329	1.7	—	—	Other & Miscellaneous Taxes	103	0.5		
Industry & Trade	349	1.8	—	—	Allocated Taxes	18,984	100	15,081	79.4
Transport & Communications	96	0.5	—	—					
Total Allocable Expenditure	12,076	62.2	9,120	47.0					
Unallocable Expenditure	7,333	37.8	10,289	53.0					
Total Relevant Expenditure	19,409				Total Tax Revenue from Residents	18,984	100		
Expenditure Abroad (excluding defence & external relations)	247				Tax Revenue from Non-Residents	1,176			
Debt Interest	2,087				Non-Tax Revenue	3,291			
Net Lending	1,399								
Non-Trading Capital Consumption	309								
Total Public Expenditure	23,451				Total Public Revenue	23,451			

Source: Derived from *National Income and Expenditure 1967–1977* (HMSO, 1978), Tables 1.7, 9.1, 9.4 and 9.7.

Notes:

(1) For details of the specific allocation routines see Appendix.

(2) The CSO allocations are the more restricted allocations carried out in official, governmental analyses in the U.K. They are discussed in the text and Appendix.

(3) The figure of £1,124 m which we allocate for the employers national insurance contribution reflects the assumption that it is incident on consumers expenditure. If it is assumed to be incident upon earnings the figure would be £1,453 m; the difference of £329 m reflects the extent to which the tax is assumed to be passed on to the consumption of non-residents of the U.K.

(4) Corporation taxes include £95 m of capital taxes paid by corporations; capital gains tax is included in capital taxes.

(5) Expenditure taxes include customs and excise duties, purchase tax, motor vehicle duties and stamp duties.

allocations to expenditure areas such as roads and public lighting and agriculture. On the tax side the CSO's allocation of just under four-fifths of tax revenue from residents has been increased to 100 percent by allocating corporation and capital taxes and completing the allocation of a number of other taxes, the most important of which are employers national insurance contributions, commercial rates and the expenditure taxes.

These tax and expenditure items are allocated, using the methods described in the Appendix, to a database which consists of the 7,239 households who made up the 1971 Family Expenditure Survey (FES). The FES is a continuous multipurpose survey of a sample of U.K. private households drawn randomly from the electoral registers of administrative areas which are themselves selected by a stratified rotating sample. The households provide detailed information on their socio-demographic characteristics, expenditure patterns and income sources.

The 7,239 households who responded in 1971 represent a response rate of about two-thirds, and there is some evidence that in 1971, as in other years, there was a lower than average response from self-employed, childless, higher income and older households (Kemsley, 1975). The CSO, however, concluded that "although there is a significant differential response on a number of social and demographic variables, their effect on the estimates of redistribution is small". (Harris, 1977). More worrying perhaps is the apparent underreporting of self-employment and capital income in the FES as compared to the national accounts. These forms of income are disproportionately important to those in the top decile of the income distribution, and it has also been widely suggested that the national accounts figures may significantly underestimate the true income from these sources because of the prevalence of "black economy" activity. Their size in the FES may therefore be a double underestimate which would both cause the degree of income inequality to be understated and distort those tax and expenditure allocations which depend upon estimates of the households' capital income. We should, therefore, urge caution in interpreting the results of those allocations.

As noted earlier, and detailed in the Appendix, we have accepted and used the CSO allocations of parts of certain in-kind benefits and indirect taxes. These estimates were derived from the detailed socio-demographic and expenditure data in the FES but had not been added to the original FES tape. This tape was therefore augmented on an exact match basis (households being matched by their FES serial numbers) to a separate tape provided by the CSO which contained the household-level details of these allocations. This integrated tape and the national accounts aggregate data summarized in Table 1 provided the basis for the allocations whose results are discussed in the remainder of this paper.

4. Redistribution by Income Classes, U.K. 1971

Table 2 sets out the summary results of the distribution of expenditure, taxes and net benefits by income deciles. The very low shares of original income in the lowest deciles reflect the exclusion from this income concept of the transfer incomes such as state pensions which make up most of the gross income of the

TABLE 2

DISTRIBUTION OF NET BENEFITS BY DECILE OF ORIGINAL INCOME, U.K. 1971

Decile	Lowest	2nd	3rd	4th	5th	6th	7th	8th	9th	Highest	All Households
Decile Point (original income)	99	482	1,029	1,367	1,685	1,967	2,274	2,698	3,410		
No. of Households	723	724	725	723	724	724	724	724	724	724	7,239
Av. Original Income	23	257	776	1,195	1,530	1,827	2,115	2,471	3,015	4,813	1,802
	(0.1)	*(1.4)*	*(4.3)*	*(6.6)*	*(8.5)*	*(10.1)*	*(11.7)*	*(13.7)*	*(16.7)*	*(26.7)*	*(100)*
Av. Gross Income	505	679	1,043	1,364	1,645	1,930	2,211	2,560	3,093	4,887	1,992
	(2,191.3)	(264.1)	(134.4)	(114.1)	(107.5)	(105.7)	(104.6)	(103.6)	(102.6)	(101.5)	(110.5)
	(2.5)	*(3.4)*	*(5.2)*	*(6.8)*	*(8.3)*	*(9.7)*	*(11.1)*	*(12.9)*	*(15.5)*	*(24.5)*	*(100)*
TOTAL ALLOCATIONS											
Expenditures	948	940	883	910	892	920	957	976	956	1,059	944
	(4,117.2)	(365.3)	(113.7)	(76.1)	(58.3)	(50.4)	(45.2)	(39.5)	(31.7)	(22.0)	(52.4)
	(10.0)	*(10.0)*	*(9.4)*	*(9.6)*	*(9.4)*	*(9.7)*	*(10.1)*	*(10.3)*	*(10.1)*	*(11.2)*	*(100)*
Taxes	148	263	449	575	715	816	936	1,042	1,319	2,161	842
	(643.4)	(102.2)	(57.8)	(48.1)	(46.7)	(44.7)	(44.3)	(42.1)	(43.7)	(44.9)	(46.7)
	(1.8)	*(3.1)*	*(5.3)*	*(6.8)*	*(8.5)*	*(9.7)*	*(11.1)*	*(12.4)*	*(15.7)*	*(25.7)*	*(100)*
Net Benefits	800	677	433	335	177	104	21	−66	−362	−1,102	102
	(3,473.8)	(263.1)	(55.8)	(28.0)	(11.6)	(5.7)	(1.0)	(−2.7)	(−12.0)	(−22.9)	(5.7)
CSO ALLOCATIONS											
CSO Expenditures	650	610	475	406	356	364	372	377	345	363	432
	(2,821.6)	(237.3)	(61.1)	(34.0)	(23.3)	(19.9)	(17.6)	(15.3)	(11.5)	(7.5)	(24.0)
	(15.0)	*(14.1)*	*(11.0)*	*(9.4)*	*(8.2)*	*(8.4)*	*(8.6)*	*(8.7)*	*(8.0)*	*(8.4)*	*(100)*
CSO Taxes	116	177	330	473	598	696	794	891	1,128	1,786	699
	(506.0)	(68.9)	(42.5)	(39.6)	(39.1)	(38.1)	(37.5)	(36.1)	(37.4)	(37.1)	(38.8)
	(1.7)	*(2.5)*	*(4.7)*	*(6.8)*	*(8.6)*	*(10.0)*	*(11.4)*	*(12.8)*	*(16.1)*	*(25.6)*	*(100)*
CSO Net Benefits	533	433	145	−67	−242	−332	−422	−514	−783	−1,423	−267
	(2,315.6)	(168.4)	(18.6)	(−5.6)	(−15.8)	(−18.2)	(−20.0)	(−20.8)	(−26.0)	(−29.6)	(−14.8)

Notes:

(1) The first entry in each cell is the average value in pounds per year of the income, expenditure or tax to households in each decile; the bracketed entry expresses this figure as a percentage of decile average original income and the italicized figure indicates the percentage of the income, expendtiure or tax received in each decile.

(2) Original income is total household income before the addition of any cash transfers or the subtraction of any taxes; gross income is original income plus cash transfers.

(3) The expenditure and net benefit figures in the total allocations are calculated with unallocable expenditures distributed on the population basis. For an examination of the effects of allocating these expenditures on an alternative basis, see Table 4.

predominantly older households in the bottom quintile. Even the inclusion of those cash transfers, however, still leaves a wide inequality in gross income, with the share of the bottom decile being about one-tenth of that of the top decile.

The most notable feature of the total expenditure distribution is the very narrow range covered by the expenditure benefits received by those in each decile; the gap of £176 between the highest and lowest figures is less than one-fifth of the average for all households of £944, and the share of total expenditures going to each decile only varies between 9.4 percent and 11.2 percent. In fact, only in the top decile does any decile share exceed 10.3 percent. Within this narrow range, the bottom two deciles each receive 10 percent of total expenditures, the next four deciles receive slightly less than 10 percent, and the top four deciles each receive a little over 10 percent.

These slight departures from an equal distribution of benefits are in marked contrast to the results of the official CSO analyses of U.K. redistribution, summary details of which are presented for comparative purposes towards the bottom of Table 2. In these data the greatest absolute benefit goes to those in the bottom income class, who are credited with 15 percent of expenditure benefits. The average value of expenditures declines through the lower deciles, varies a little around this lower plateau in the higher deciles, and is at its lowest in the second highest decile. Thus the range of the value of expenditure benefits by decile is much greater, and, at £305, is over 70 percent of the average for all households. The official analyses of the distributional impact of U.K. public expenditure therefore present a picture which is markedly more favourable to lower income deciles than that which emerges from a total analysis.

The tax-side results show that while the absolute value of taxes paid increases steadily with income, the relative burden on the different income groups declines slightly from the third decile up to the eighth. Overall, if shares of taxes paid are compared to shares of gross income, it is clear that the distribution of the tax burden is approximately proportional with respect to gross income. The CSO distributions are not as different from the more complete distribution of tax payments as was the case with expenditures, but they do make the tax system appear slightly progressive, with comparatively smaller shares of taxes being paid by the bottom three deciles and greater shares by the fifth to the ninth deciles.

The total allocations therefore show expenditures to be approximately equally distributed among the decile groups and taxes to be approximately proportional to income; the CSO allocation show both expenditures and taxes to be more pro-poor in their incidence. Both sets of allocations, however, show a net benefit distribution which is strongly redistributive to lower income groups: in both absolute and relative terms net benefits decline as income increases. It is, however, interesting to note that in moving from the partial to the total allocations the greatest net gains are made by the middle deciles: average annual net benefits increase by £369, but the increase in each decile from the fourth to the ninth is over £400 while lesser gains are made in the top and in the bottom three deciles. This is in line with the earlier results that the partial analyses generally overstate the degree of income redistribution in the U.K.[2]

[2]The fact that average net benefits equal 12 percent of average taxes rather than 2 percent (the amount by which allocated public expenditure exceeded allocated public revenues) indicates the problems which remain in relating population (national accounts) data to sample data and allocations.

Table 3 presents the distribution of the main allocable public expenditure items and shows that the only item which is consistently more beneficial to lower income groups in both absolute and relative terms is, not surprisingly, expenditure on income maintenance: a quarter of these benefits go to the lowest decile, and the three bottom deciles receive over three fifths of total income maintenance expenditures.

Each of the other benefits is progressive with respect to income in that each consistently declines in relative value as average incomes increase, but the majority of them are of greater absolute value to households in higher income ranges. Thus, the absolute value of education spending is over three times as great for households in the top decile as for those in the bottom, and each of the deciles in the top half of the distribution receives more than 10 percent of total education expenditures. A similar pattern is evident for the roads and water categories, though the amounts involved are much smaller in these instances. Health care benefits under the U.K. national health service are roughly equal across the deciles, while measured housing benefits differ significantly from approximate equality only in the top and bottom deciles.

The combined effect of these and other allocable expenditure programmes is to produce a distribution of allocable expenditures which gives the greatest benefit in both absolute and relative terms to the bottom decile. Total benefits then decline steadily until the fifth decile, after which they rise again, but rather slowly, so that the top decile receives a share similar to that of the third decile.

The total public expenditure and net benefit figures in Table 2 had the unallocable expenditures distributed on the assumption that they vary with the number of persons in a household; i.e. that all persons benefit equally. Table 4, in order to show the results and effects of using different assumptions in assigning unallocable expenditures, presents the distribution of these expenditures and of net benefits under this assumption and two others: that unallocable expenditures vary with household income, and that they vary with capital income.[3] The rationale for these three assumptions is explained in our paper in the previous issue of this review (Ruggles and O'Higgins, 1981).

Unallocable expenditures distributed on a *per capita* basis are of least value to the bottom decile, rise steadily in absolute value until the middle of the distribution and rise more slowly thereafter. By definition, the income basis provides a strictly proportionate distribution, so that the absolute benefit is greater for the higher income groups. In contrast, when the capital income basis is used the distribution has two peaks, giving substantial benefits to the second and third deciles, then falling away only to rise sharply in the top quintile and especially the top decile. The second and third deciles gain more under this than under either of the other two assumptions, and the third decile gains more than any decile other than the top one. Because of the lesser reliability of the capital income data in the FES (which we discussed earlier) the precise figures which result from allocating on the capital income basis should not be invested with great significance, but the general shape of the allocation appears reasonable and reflects the concentration of older people with some capital income in the

[3]Capital income is defined as investment and property income, interest, annuities and private pensions.

TABLE 3

THE DISTRIBUTION OF PUBLIC EXPENDITURES BY DECILE OF ORIGINAL INCOME, U.K. 1971

Decile	Lowest	2nd	3rd	4th	5th	6th	7th	8th	9th	Highest	All Households
Income Maintenance	481	422	267	169	115	104	97	88	78	74	190
	(2,091.3)	(164.1)	(34.4)	(14.1)	(7.5)	(5.7)	(4.6)	(3.6)	(2.6)	(1.5)	(10.5)
	(5.4)	*(22.3)*	*(14.1)*	*(8.9)*	*(6.1)*	*(5.5)*	*(5.1)*	*(4.7)*	*(4.1)*	*(3.9)*	*(100)*
Education	49	73	96	117	127	149	164	181	164	184	130
	(210.7)	(28.5)	(12.3)	(9.8)	(8.3)	(8.2)	(7.7)	(7.3)	(5.4)	(3.8)	(7.2)
	(3.7)	*(5.6)*	*(7.3)*	*(9.0)*	*(9.8)*	*(11.5)*	*(12.6)*	*(13.9)*	*(12.5)*	*(14.1)*	*(100)*
Health	96	104	98	100	105	102	105	104	102	111	103
	(415.1)	(40.4)	(12.7)	(8.4)	(6.8)	(5.6)	(5.0)	(4.2)	(3.4)	(2.3)	(5.7)
	(9.3)	*(10.1)*	*(9.6)*	*(9.8)*	*(10.2)*	*(9.9)*	*(10.2)*	*(10.1)*	*(9.9)*	*(10.8)*	*(100)*
Housing	60	37	41	49	41	45	39	37	34	25	41
	(260.0)	(14.3)	(5.3)	(4.1)	(2.6)	(2.5)	(1.9)	(1.5)	(1.1)	(0.5)	(2.3)
	(14.7)	*(9.0)*	*(10.0)*	*(12.1)*	*(9.9)*	*(11.0)*	*(9.6)*	*(9.1)*	*(8.4)*	*(6.0)*	*(100)*
Roads and Public Lighting	6	10	15	21	26	29	32	35	41	57	27
	(25.3)	(3.9)	(1.9)	(1.8)	(1.7)	(1.6)	(1.5)	(1.4)	(1.4)	(1.2)	(1.5)
	(2.1)	*(3.7)*	*(5.4)*	*(7.8)*	*(9.5)*	*(10.7)*	*(11.7)*	*(12.9)*	*(15.3)*	*(20.9)*	*(100)*
Water Supply and Refuse Disposal	8	9	12	14	16	17	18	20	21	27	16
	(33.9)	(3.7)	(1.5)	(1.2)	(1.0)	(0.9)	(0.9)	(0.8)	(0.7)	(0.6)	(0.9)
	(4.8)	*(5.8)*	*(7.3)*	*(8.8)*	*(9.7)*	*(10.4)*	*(11.1)*	*(12.1)*	*(13.2)*	*(16.7)*	*(100)*
All Allocable Public Expenditure	741	705	580	523	477	493	510	518	502	574	562
	(3,217.9)	(273.9)	(74.7)	(43.8)	(31.2)	(27.0)	(24.1)	(21.0)	(16.6)	(11.9)	(31.2)
	(13.2)	*(12.5)*	*(10.3)*	*(9.3)*	*(8.5)*	*(8.8)*	*(9.1)*	*(9.2)*	*(8.9)*	*(10.2)*	*(100)*

Notes:

(1) The first entry in each cell is the average value in pounds per year of the expenditure for households in each decile; the bracketed entry expresses this figure as a percentage of decile average original income and the italicized figure indicates the percentage of the expenditure received in each decile.

(2) Income maintenance includes only cash transfers; the adminstrative costs of the income maintenance system are separately allocated and are included in the all allocable public expenditure figure.

TABLE 4

THE DISTRIBUTION OF NET BENEFITS AND UNALLOCABLE PUBLIC EXPENDITURES BY DECILE OF ORIGINAL INCOME UNDER THREE ASSUMPTIONS, U.K. 1971

Decile	Lowest	2nd	3rd	4th	5th	6th	7th	8th	9th	Highest	All Households
(A) UNALLOCABLE EXPENDITURES											
1. Population Basis	207	235	303	387	415	427	446	457	455	485	382
	(899.3)	(91.3)	(39.0)	(32.4)	(27.1)	(23.4)	(21.1)	(18.5)	(15.1)	(10.1)	(21.2)
	(5.4)	*(6.2)*	*(7.9)*	*(10.1)*	*(10.9)*	*(11.2)*	*(11.7)*	*(12.0)*	*(11.9)*	*(12.7)*	*(100)*
2. Income Basis	5	55	165	253	324	387	488	524	639	1,020	382
	(21.2)	(21.2)	(21.2)	(21.2)	(21.2)	(21.2)	(21.2)	(21.2)	(21.2)	(21.2)	(21.2)
	(0.1)	*(1.4)*	*(4.3)*	*(6.6)*	*(8.5)*	*(10.1)*	*(11.7)*	*(13.7)*	*(16.7)*	*(26.7)*	*(100)*
3. Capital Income Basis	37	372	502	240	258	196	287	245	378	1,296	382
	(159.6)	(144.8)	(65.0)	(20.1)	(16.9)	(10.7)	(13.6)	(9.9)	(12.5)	(26.9)	(21.2)
	(1.0)	*(9.8)*	*(13.2)*	*(6.3)*	*(6.8)*	*(5.1)*	*(7.5)*	*(6.4)*	*(9.9)*	*(34.0)*	*(100)*
(B) NET BENEFITS											
1. Population Basis	800	677	433	335	177	104	21	−66	−362	−1,102	102
	(3,473.8)	(263.1)	(55.8)	(28.0)	(11.6)	(5.7)	(1.0)	(−2.7)	(−12.0)	(−22.9)	(5.7)
2. Income Basis	598	496	295	201	86	65	23	1	−178	−566	102
	(2,595.7)	(193.0)	(38.0)	(16.8)	(5.6)	(3.5)	(1.1)	(0.0)	(−5.9)	(−11.8)	(5.7)
3. Capital Income Basis	629	814	633	188	20	−127	−139	−278	−439	−291	102
	(2,734.1)	(316.6)	(81.5)	(15.8)	(1.3)	(−6.9)	(−6.6)	(−11.3)	(−14.6)	(−6.0)	(5.7)

Notes:

(1) The first entry in each cell is the average value in pounds per year of the expenditure or net benefit to households in each decile; the bracketed entry expresses this figure as a percentage of average original income in each decile; and the italicized figure indicates the percentage of the expenditure received in each decile.

(2) The population, income and capital income assumptions are discussed in the text.

second and third deciles and the unsurprising importance of capital income in the top decile.

Each allocation assumption therefore favours different deciles. The population basis would allocate the greatest benefit to the bottom and middle (fourth to sixth) deciles; the income assumption allocates most to the high (seventh to ninth) deciles; and the top and low (second and third) deciles would receive most under the capital income method. However, the rank order positions on the population and income assumptions are similar, apart from one minor transposition, and for the fourth to ninth deciles the difference between the extreme pair amongst the three assumptions never exceeds $12\frac{1}{2}$ percent of original income. (In the U.S. data, the comparable figure for the fourth to the top deciles was $11\frac{1}{2}$ percent.) The results in the majority of deciles are therefore relatively insensitive to the particular assumption used. More importantly, perhaps, in the U.K. context, it may be noted that whichever of the three assumptions is employed the results of the total allocations give a less pro-poor picture than the CSO results, so that the overall impact of redistribution through public finance in the U.K. favours lower income groups less than is usually indicated.

As stated earlier, our tax-side results represent the first application of our allocation routines to the U.K., and we therefore devote more attention to the details of these results than in the U.S. paper. Table 5 presents the distribution of taxes by income deciles and emphasizes the importance of a progressive income tax in ensuring that the overall tax burden is proportional rather than regressive. Households in each of the bottom six deciles pay a lower share of income tax than of all taxes. The crossover point is in the seventh decile, and in the top three deciles households fare worse under income tax than under all taxes. Employees national insurance contributions are less progressive: they bear relatively lightly on households in the bottom three deciles, and more heavily in the fourth to ninth. While they are larger in the tenth decile than in any other, they (like all taxes apart from income tax and capital taxes) represent a smaller share of this tax than the decile pays in taxes generally. The allocation of this tax therefore clearly shows its two most significant features: it is a tax on work income and so is less important at the top and bottom of the distribution, and while generally levied at a proportional rate it is not payable on that part of work income above a certain limit so that high earners bear a relatively lower burden. Transformation into a proportional social security tax on all income would increase its progressivity.

Table 5 shows the effects of two alternative ways of treating employers national insurance payments. The conventionally used assumption in the U.K. is that they are passed on in higher prices to consumers. This produces a distribution which increases absolutely with income but declines in relative terms, and leaves each of the bottom five deciles paying a greater share of this than of all taxes, and the top five paying a lesser share. By contrast, using the assumption that the tax is borne by workers through reduced earnings produces a distribution which, obviously, is similar to that for the employees contribution—progressive in the lower half of the distribution and then becoming mildly regressive. The choice of the earnings assumption would therefore reduce the apparent burden

TABLE 5

THE DISTRIBUTION OF TAXES BY DECILE OF ORIGINAL INCOME, U.K. 1971

Decile	Lowest	2nd	3rd	4th	5th	6th	7th	8th	9th	Highest	All Households
Income Tax	1	15	68	119	176	230	287	328	460	918	260
	(4.0)	(5.7)	(8.8)	(10.0)	(11.5)	(12.6)	(13.6)	(13.3)	(15.3)	(19.1)	(14.5)
	(0.0)	*(0.6)*	*(2.6)*	*(4.6)*	*(6.8)*	*(8.8)*	*(11.0)*	*(12.6)*	*(17.7)*	*(35.3)*	*(100)*
Employees National	0	3	31	60	73	84	92	100	115	132	69
Insurance	(0.8)	(1.2)	(4.0)	(5.0)	(4.8)	(4.6)	(4.3)	(4.1)	(3.8)	(2.8)	(3.8)
Contributions	*(0.0)*	*(0.4)*	*(4.5)*	*(8.6)*	*(10.5)*	*(12.2)*	*(13.3)*	*(14.6)*	*(16.6)*	*(19.2)*	*(100)*
Employers National	16	26	36	42	48	52	58	65	78	122	54
Insurance	(70.8)	(10.0)	(4.6)	(3.5)	(3.1)	(2.8)	(2.8)	(2.6)	(2.6)	(2.5)	(3.0)
(Consumption)	*(3.0)*	*(4.7)*	*(6.6)*	*(7.7)*	*(8.8)*	*(9.6)*	*(10.8)*	*(12.0)*	*(14.4)*	*(22.4)*	*(100)*
Employers National	0	2	27	54	67	79	87	97	113	125	65
Insurance	(0)	(0.7)	(3.5)	(4.5)	(4.4)	(4.3)	(4.1)	(3.9)	(3.7)	(2.6)	(3.6)
(Earnings)	*(0.0)*	*(0.3)*	*(4.1)*	*(8.3)*	*(10.4)*	*(12.1)*	*(13.3)*	*(14.9)*	*(17.3)*	*(19.3)*	*(100)*
Domestic Rates	31	35	40	39	44	46	48	52	58	73	47
	(135.1)	(13.7)	(5.2)	(3.3)	(2.9)	(2.5)	(2.3)	(2.1)	(1.9)	(1.5)	(2.6)
	(6.6)	*(7.5)*	*(8.6)*	*(8.4)*	*(9.4)*	*(9.9)*	*(10.4)*	*(11.1)*	*(12.4)*	*(15.7)*	*(100)*
Direct Expenditure	47	76	126	172	212	233	256	286	351	465	222
Taxes	(205.4)	(29.4)	(16.3)	(14.4)	(13.9)	(12.8)	(12.1)	(11.6)	(11.6)	(9.7)	(12.3)
	(2.1)	*(3.4)*	*(5.7)*	*(7.7)*	*(9.5)*	*(10.5)*	*(11.5)*	*(12.9)*	*(15.8)*	*(20.9)*	*(100)*
Corporation Tax	13	32	43	36	40	40	47	50	62	121	49
	(55.6)	(12.6)	(5.6)	(3.0)	(2.6)	(2.2)	(2.2)	(2.0)	(2.1)	(2.5)	(2.7)
	(2.6)	*(6.7)*	*(8.9)*	*(7.4)*	*(8.3)*	*(8.3)*	*(9.8)*	*(10.3)*	*(12.8)*	*(25.0)*	*(100)*
Capital Taxes	1	15	20	9	10	8	11	10	15	51	15
	(6.2)	(5.7)	(2.5)	(0.8)	(0.7)	(0.4)	(0.5)	(0.4)	(0.5)	(1.1)	(0.8)
	(1.0)	*(9.8)*	*(13.2)*	*(6.3)*	*(6.8)*	*(5.1)*	*(7.5)*	*(6.4)*	*(9.9)*	*(34.0)*	*(100)*
All Taxes	148	263	449	575	715	816	936	1,042	1,319	2,161	842
	(643.4)	(102.2)	(57.8)	(48.1)	(46.7)	(44.7)	(44.3)	(42.1)	(43.7)	(44.9)	(46.7)
	(1.8)	*(3.1)*	*(5.3)*	*(6.8)*	*(8.5)*	*(9.7)*	*(11.1)*	*(12.4)*	*(15.7)*	*(25.7)*	*(100)*

Notes:

(1) The first entry in each cell is the average tax paid in pounds per year in each decile; the bracketed entry expresses this figure as a percentage of average original income in each decile; and the italicized figure indicates the percentage of the tax paid by each decile.

(2) For a discussion of the two assumptions about the employers national insurance contribution see Appendix. The consumption assumption is used in calculating total taxes. If the earnings assumption were to be generally used, original income figures would be increased by the value of employers national insurance; strictly speaking, therefore, the values of employers contributions as a percentage of original income are slightly overestimated in the table.

(3) Direct expenditure taxes include those parts of customs and excise duties, purchase tax, motor vehicle and stamp duties, and of various licensing charges which are assumed to fall directly on the consumer.

on the bottom three deciles and increase it for the next six, while leaving the top decile largely unaffected.

The remaining taxes generally increase with income but not proportionately, leaving a regressive impact which is mild in the case of expenditure taxes and less so, but quantitatively less important, for domestic rates. Both corporation and capital taxes have a reduced relative impact in the middle of the distribution but become slightly more important at the top.

In sum, then, the proportional impact of U.K. taxes is the product of a mixture involving a fairly progressive income tax which accounts for just under one third of average taxes, social insurance contributions which have a mixed but on balance slightly regressive impact and expenditure and property taxes which are regressive.

Income is of course not the only characteristic whereby expenditure benefits or tax burdens are determined or assessed, and we now turn to another, household size.

5. Redistribution by Household Size, U.K. 1971

Table 6 presents the summary net benefit data for households categorized by their size. The households' income shares are generally somewhere between their shares in the number of households and the number of individuals, with two and three person households most comfortable in terms of income share per individual, one and four person households roughly "breaking even," and large households faring worst.

The value of total expenditures increases consistently with household size, and, compared to income, is relatively more important for single person and larger households. It mirrors quite closely the distribution of individuals, with slightly larger shares among the two smallest household types and slightly smaller ones thereafter in all but the largest households. The extent to which this simply reflects the use of the population assumption in allocating the unallocables can be checked in Table 7 which shows that total allocable expenditures increase consistently with household size, are relatively more important for single person and larger households and, as compared to total expenditures, benefit single and two person households slightly more at the expense of three to seven person households. In general, the conclusion that public expenditures are distributed according to household size is largely valid if single person households are excepted.

Taxes are lower absolutely but higher relatively for one and two person households, but become fairly similar both absolutely and relatively for the other household sizes. The product of constant taxes and increasing expenditures is that the net benefit distribution shows consistent gains, absolutely and relatively, as household size increases from two persons. Two and three person households are the only net losers, and as they were earlier identified as being most comfortable in terms of income share per individual, this outcome can be termed progressive.

These patterns in the total allocations picture are similar in shape, though obviously different in magnitudes, to those which emerge from the CSO alloca-

TABLE 6

THE DISTRIBUTION OF NET BENEFITS BY HOUSEHOLD SIZE, U.K. 1971

Household Size	1	2	3	4	5	6	7	8 or more	All Households
No. of Households	1,248	2,311	1,367	1,290	608	233	98	84	7,239
% of all Households	17.2	31.9	18.9	17.8	8.4	3.2	1.4	1.2	100
% of all Individuals	5.9	22.0	19.5	24.6	14.5	6.6	3.3	3.5	100
Average Original Income	612	1,625	2,163	2,422	2,369	2,493	2,162	2,528	1,802
	(5.9)	*(28.9)*	*(22.7)*	*(23.9)*	*(11.0)*	*(4.5)*	*(1.6)*	*(1.6)*	*(100)*
Average Gross Income	860	1,840	2,307	2,531	2,554	2,707	2,491	2,955	1,992
	(140.5)	(113.2)	(106.7)	(104.5)	(107.8)	(108.6)	(115.2)	(116.9)	(110.5)
	(7.4)	*(29.5)*	*(21.9)*	*(22.6)*	*(10.8)*	*(4.4)*	*(1.7)*	*(1.7)*	*(100)*
TOTAL ALLOCATIONS									
Expenditures	542	723	904	1,114	1,533	1,811	2,266	2,822	944
	(88.6)	(44.5)	(41.8)	(46.0)	(64.7)	(72.6)	(104.8)	(111.6)	(52.4)
	(9.9)	*(24.4)*	*(18.1)*	*(21.0)*	*(13.6)*	*(6.2)*	*(3.2)*	*(3.5)*	*(100)*
Taxes	393	828	981	1,006	1,022	1,082	971	1,016	842
	(64.2)	(51.0)	(45.4)	(41.5)	(43.1)	(43.4)	(44.9)	(40.2)	(46.7)
	(8.1)	*(31.4)*	*(22.0)*	*(21.3)*	*(10.2)*	*(4.1)*	*(1.6)*	*(1.4)*	*(100)*
Net Benefits	149	−105	−77	108	511	729	1,295	1,806	102
	(24.3)	(−6.5)	(−3.6)	(4.5)	(21.6)	(29.2)	(59.9)	(71.5)	(5.7)
CSO ALLOCATIONS									
CSO Expenditures	333	346	376	432	687	820	1,117	1,414	432
	(54.4)	(21.3)	(17.4)	(17.8)	(29.0)	(32.9)	(51.7)	(55.9)	(24.0)
	(13.3)	*(25.6)*	*(16.5)*	*(17.8)*	*(13.4)*	*(6.1)*	*(3.5)*	*(3.8)*	*(100)*
CSO Taxes	283	669	831	865	882	927	844	872	699
	(46.2)	(41.2)	(38.4)	(35.7)	(37.2)	(37.2)	(39.0)	(34.5)	(38.8)
	(7.0)	*(30.6)*	*(22.5)*	*(22.0)*	*(10.6)*	*(4.3)*	*(1.6)*	*(1.4)*	*(100)*
CSO Net Benefits	50	−323	−455	−432	−195	−107	272	542	−267
	(8.2)	(−19.9)	(−21.0)	(−17.8)	(−8.2)	(−4.3)	(12.6)	(21.4)	(−14.8)

Notes: See notes 1 to 2 of Table 2.

TABLE 7

THE DISTRIBUTION OF PUBLIC EXPENDITURES BY HOUSEHOLD SIZE, U.K. 1971

Household Size	1	2	3	4	5	6	7	8 or more	All Households
Income Maintenance	247	215	144	108	184	214	329	427	190
	(40.4)	(13.2)	(6.7)	(4.5)	(7.8)	(8.6)	(15.2)	(16.9)	(10.5)
	(22.5)	*(36.2)*	*(14.4)*	*(10.2)*	*(8.2)*	*(3.6)*	*(2.3)*	*(2.6)*	*(100)*
Education	11	27	111	208	367	443	605	750	130
	(1.8)	(1.7)	(5.1)	(8.6)	(15.5)	(17.8)	(28.0)	(29.7)	(7.2)
	(1.4)	*(6.5)*	*(16.1)*	*(28.5)*	*(23.6)*	*(10.9)*	*(6.3)*	*(6.7)*	*(100)*
Health	59	94	112	113	135	155	169	214	103
	(9.6)	(5.8)	(5.2)	(4.7)	(5.7)	(6.2)	(7.8)	(8.5)	(5.7)
	(9.9)	*(29.3)*	*(20.7)*	*(19.6)*	*(11.0)*	*(4.8)*	*(2.2)*	*(2.4)*	*(100)*
Housing	40	35	41	38	50	67	69	77	41
	(6.5)	(2.2)	(1.9)	(1.6)	(2.1)	(2.7)	(3.2)	(3.0)	(2.3)
	(16.9)	*(27.7)*	*(18.9)*	*(16.5)*	*(10.3)*	*(5.3)*	*(2.3)*	*(2.2)*	*(100)*
Roads & Public Lighting	9	25	32	37	35	37	33	35	27
	(1.5)	(1.5)	(1.5)	(1.5)	(1.5)	(1.5)	(1.5)	(1.4)	(1.5)
	(5.9)	*(28.8)*	*(22.5)*	*(24.2)*	*(11.0)*	*(4.4)*	*(1.6)*	*(1.5)*	*(100)*
Water Supply & Refuse Disposal	8	14	18	21	23	27	27	32	16
	(1.3)	(0.9)	(0.8)	(0.9)	(1.0)	(1.1)	(1.2)	(1.2)	(0.9)
	(8.2)	*(26.9)*	*(20.8)*	*(22.5)*	*(11.8)*	*(5.3)*	*(2.2)*	*(2.3)*	*(100)*
All Allocable Public Expenditure	410	459	509	588	875	1,022	1,344	1,673	562
	(67.0)	(28.2)	(23.5)	(24.3)	(36.9)	(41.0)	(62.2)	(66.2)	(31.2)
	(12.6)	*(26.1)*	*(17.1)*	*(18.6)*	*(13.1)*	*(5.8)*	*(3.2)*	*(3.5)*	*(100)*
Unallocable Expenditures (Population Basis)	132	263	395	527	658	790	922	1,149	382
	(21.6)	(16.2)	(18.3)	(21.8)	(27.8)	(31.7)	(42.6)	(45.4)	(21.2)
	(5.9)	*(22.0)*	*(19.5)*	*(24.6)*	*(14.5)*	*(6.6)*	*(3.3)*	*(3.5)*	*(100)*
Unallocable Expenditures (Income Basis)	130	345	459	514	503	529	459	536	382
	(21.2)	(21.2)	(21.2)	(21.2)	(21.2)	(21.2)	(21.2)	(21.2)	(21.2)
	(5.9)	*(28.9)*	*(22.7)*	*(23.9)*	*(11.0)*	*(4.5)*	*(1.6)*	*(1.6)*	*(100)*
Unallocable Expenditures (Capital Income Basis)	540	563	305	191	140	129	18	52	382
	(88.2)	(34.6)	(14.1)	(7.9)	(5.9)	(5.2)	(0.8)	(2.0)	(21.2)
	(24.4)	*(47.2)*	*(15.1)*	*(8.9)*	*(3.1)*	*(1.1)*	*(0.1)*	*(0.2)*	*(100)*

Notes:

(1) The first entry in each cell is the average value in pounds per year of the expenditure for households in each decile; the bracketed entry expresses this figure as a percentage of decile average original income and the italicized figure indicates the percentage of the expenditure received in each decile.

(2) Income maintenance includes only cash transfers; the administrative costs of the income maintenance system are separately allocated and are included in the all allocable public expenditure figure.

tions, and confirm that the overall distribution of expenditure benefits is better understood in terms of household size than household income.

The data in Table 7, however, demonstrate again that this tidy conclusion is the product of the conflicting impacts of several specific expenditures. Income maintenance, health and housing expenditures are received by one and two person households to a much greater extent than their numbers would suggest, while households with four or more persons, who lose out on each of those benefits, benefit disproprotionately from education expenditures.

If the results are measured in terms of the relative additions to original income which these various expenditures represent, larger households do well on each expenditure.

The bottom of Table 7 shows the distribution of unallocables on each of the three assumptions. Once again, the population and income methods produce a similar pattern of results, though the population basis is markedly more favourable to larger households. The capital income assumption concentrates almost three-quarters of the benefits on the two smallest-sized household types, and gives more to each of them, and less to each other size of household, than either of the other two assumptions. Only to three person households does the income basis provide the largest benefits. The overall pattern is such that, in contrast with the results as applied to income deciles, only in one category of household (three persons) does the difference between the extreme pair amongst the three assumptions amount to less than $12\frac{1}{2}$ percent of original income. (In the U.S. results, a similar pattern emerged insofar as the capital income method was of most benefit to the smallest households, the income basis to two and three person households, and the population basis for the rest. However, only for one, seven and eight or more person households was the difference between the extreme pair of assumptions more than 10 percent of original income.)

The detailed results of the distribution of taxes by household size are shown in Table 8 and indicate that the fact that single person households paid the highest proportion of their original incomes in taxes occurred even though for each particular tax (apart from the quantitatively unimportant capital taxes) their absolute tax payments were significantly lower than those of any other size of household. This was offset by their lower average income so that only in the cases of employees social insurance and, marginally (and perhaps surprisingly), expenditure taxes were the particular taxes a smaller than average proportion of their incomes.

For the other household sizes, the distribution of the burden of each tax (again excepting capital taxes) was very similar to the distribution of all taxes, so that the approximately proportional impact of total taxes by household size is a consequence of a similar approximate proportionality among the indivdiual taxes.

If the results by income decile and by household size are compared, the expenditure distribution proves to be roughly equal with respect to income and increasing with respect to household size, but these overall results reflect, in both cases, a conflicting mix of particular effects. The tax burden is approximately proportional to income and equal with respect to household size, but while the latter is the result of a series of largely similar effects of particular taxes, the

TABLE 8

THE DISTRIBUTION OF TAXES BY HOUSEHOLD SIZE, U.K. 1971

Household Size	1	2	3	4	5	6	7	8 or more	All Households
Income Tax	113	275	308	308	306	285	226	184	260
	(18.4)	(16.9)	(14.2)	(12.7)	(12.9)	(11.4)	(10.4)	(7.3)	(14.5)
	(7.5)	*(33.8)*	*(22.3)*	*(21.1)*	*(9.9)*	*(3.5)*	*(1.2)*	*(0.8)*	*(100)*
Employees National	19	58	87	94	94	102	99	117	69
Insurance Contributions	(3.0)	(3.6)	(4.0)	(3.9)	(3.9)	(4.1)	(4.6)	(4.6)	(3.8)
	(4.6)	*(27.2)*	*(23.9)*	*(24.2)*	*(11.4)*	*(4.8)*	*(1.9)*	*(2.0)*	*(100)*
Employers National	27	51	62	65	67	77	68	79	54
Insurance Contributions	(4.5)	(3.1)	(2.9)	(2.7)	(2.8)	(3.1)	(3.2)	(3.1)	(3.0)
—on consumption	*(8.7)*	*(30.0)*	*(21.6)*	*(21.3)*	*(10.4)*	*(4.6)*	*(1.7)*	*(1.7)*	*(100)*
Employers National	17	55	83	89	87	95	96	118	65
Insurance Contributions	(2.8)	(3.4)	(3.8)	(3.7)	(3.7)	(3.8)	(4.4)	(4.7)	(3.6)
—on earnings	*(4.6)*	*(27.0)*	*(24.0)*	*(24.3)*	*(11.3)*	*(4.7)*	*(2.0)*	*(2.1)*	*(100)*
Domestic Rates	36	46	49	52	53	53	49	49	47
	(5.9)	(2.8)	(2.3)	(2.2)	(2.2)	(2.1)	(2.3)	(2.0)	(2.6)
	(13.3)	*(31.2)*	*(19.9)*	*(19.8)*	*(9.5)*	*(3.6)*	*(1.4)*	*(1.2)*	*(100)*
Expenditure Taxes	73	201	270	284	297	326	329	356	222
	(11.9)	(12.4)	(12.5)	(11.7)	(12.5)	(13.1)	(15.2)	(14.1)	(12.3)
	(5.6)	*(28.9)*	*(22.9)*	*(22.8)*	*(11.2)*	*(4.7)*	*(2.0)*	*(1.9)*	*(100)*
Corporation Tax	39	54	50	47	47	54	44	51	49
	(6.3)	(3.3)	(2.3)	(2.0)	(2.0)	(2.2)	(2.0)	(2.0)	(2.7)
	(13.8)	*(35.3)*	*(19.4)*	*(17.4)*	*(8.1)*	*(3.6)*	*(1.2)*	*(1.2)*	*(100)*
Capital Taxes	21	22	12	7	5	5	1	2	15
	(3.4)	(1.3)	(0.6)	(0.3)	(0.2)	(0.2)	(0.0)	(0.1)	(0.8)
	(24.4)	*(47.1)*	*(15.1)*	*(8.9)*	*(3.1)*	*(1.1)*	*(0.1)*	*(0.2)*	*(100)*
All Taxes	393	828	981	1,006	1,022	1,082	971	1,016	842
	(64.2)	(51.0)	(45.4)	(41.5)	(43.1)	(43.4)	(44.9)	(40.2)	(46.7)
	(8.1)	*(31.4)*	*(22.0)*	*(21.3)*	*(10.2)*	*(4.1)*	*(1.6)*	*(1.4)*	*(100)*

Notes:

(1) The first entry in each cell is the average tax paid in pounds per year in each decile; the bracketed entry expresses this figure as a percentage of average original income in each decile; and the italicized figure indicates the percentage of the tax paid by each decile.

(2) For a discussion of the two assumptions about the employers national insurance contribution see Appendix. The consumption assumption is used in calculating total taxes. If the earnings assumption were to be generally used, original income figures would be increased by the value of employers national insurance; strictly speaking, therefore, the values of employers contributions as a percentage of original income are slightly overestimated in the table.

(3) Direct expenditure taxes include those parts of customs and excise duties, purchase tax, motor vehicle and stamp duties, and of various licensing charges which are assumed to fall directly on the consumer.

former comes from a much more conflicting pattern of progressivity and regressivity for particular taxes.

6. Redistribution by Number of Workers and Housing Tenure, U.K. 1971

In order to examine the nature of redistribution with respect to some other important socioeconomic characteristics, Tables 9 and 10 present the summary data by number of workers and by housing tenure.

Table 9 shows that almost two-thirds of original income goes to households with two or more earners, who form just over two-fifths of households (but almost three-quarters of all earners); this reflects both the extent to which unequal household earnings explain unequal original incomes and also the extent to which those unequal earnings may be regarded as justified by inequality of work effort. How do taxes and benefits impinge upon these inequalities?

The net benefit data show that the process of redistribution benefits households without an earner and penalizes those with two or more earners, leaving single earner households (whether married or unmarried) with average net benefits. This constitutes a progressive response to the inequalities in original household income, and can be said to result from proportional taxes and equal expenditures. Single unmarried earner households receive a low share of expenditures, relative to their numbers, and this benefit "shortfall" goes to households with three or more earners; other household types receive similar amounts. The tax burden increases in absolute terms with the number of earners, and while it is regressive with respect to the average income of each household type, the shares of taxes paid are much lower for none and one unmarried earners, and much higher for two and three or more earners, than their relative numbers of households would suggest.

Detailed tax and expenditure data (not presented here) indicate that income transfers are, as one would expect, most significant for households with less than two earners, but that households with three or more earners receive more expenditure benefits from spending on education, health and housing than do other households. The tax details are as one would by now expect: most taxes increase as the number of earners (and therefore income) increases, but domestic rates and corporation tax are relatively constant with respect to this household characteristic.

The overall expenditure and tax allocations are similar, apart from the shift in magnitude, for the CSO and total allocations except that the total allocations in both cases are slightly less progressive, leading to a less progressive distribution of net benefits.

Table 10 presents the housing tenure data, which show that on average those who are in the process of buying their houses have significantly higher incomes than other households whilst private sector tenants are the least well off. Despite this fact, total expenditure benefits are lowest for those private tenants, while mortgage-owners are second highest of the four groups in terms of benefits received, although the benefits represent a smaller addition to their income than is the case for any of the other tensure groups.

TABLE 9

THE DISTRIBUTIONS OF NET BENEFITS BY NUMBER OF EARNERS IN HOUSEHOLD, U.K. 1971

Number of Earners	None	One Unmarried	One Married	Two	Three or More	All
No. of Households	1,481	816	1,784	2,367	791	7,239
% of Households	20.5	11.3	24.6	32.7	10.9	100
Average Original Income	365	1,179	1,869	2,398	3,206	1,802
	(4.1)	*(7.4)*	*(25.5)*	*(43.5)*	*(19.4)*	*(100)*
Average Gross Income	791	1,387	2,010	2,495	3,318	1,992
	(216.8)	(117.6)	(107.6)	(104.1)	(103.5)	(110.5)
	(8.1)	*(7.8)*	*(24.9)*	*(41.0)*	*(18.2)*	*(100)*
TOTAL ALLOCATIONS						
Expenditures	915	672	981	920	1,266	944
	(250.9)	(57.0)	(52.5)	(38.4)	(39.5)	(52.4)
	(19.8)	*(8.0)*	*(25.6)*	*(31.9)*	*(14.7)*	*(100)*
Taxes	397	582	859	1,016	1,387	842
	(108.9)	(49.3)	(46.0)	(42.4)	(43.3)	(46.7)
	(9.6)	*(7.8)*	*(25.1)*	*(39.4)*	*(18.0)*	*(100)*
Net Benefits	518	90	122	−96	−121	102
	(142.0)	(7.6)	(6.6)	(−4.0)	(−3.8)	(5.6)
CSO ALLOCATIONS						
CSO Expenditures	594	367	401	353	500	432
	(162.8)	(31.1)	(21.5)	(14.7)	(15.6)	(24.0)
	(28.1)	*(9.6)*	*(22.9)*	*(26.8)*	*(12.7)*	*(100)*
CSO Taxes	235	477	723	877	1,209	699
	(64.4)	(40.4)	(38.7)	(36.6)	(37.7)	(38.9)
	(6.9)	*(7.7)*	*(25.5)*	*(41.0)*	*(18.9)*	*(100)*
CSO Net Benefits	359	−110	−323	−524	−709	−267
	(98.4)	(−9.3)	(−17.3)	(−21.9)	(−22.1)	(−14.8)

Notes:

(1) See Notes 1 and 2 of Table 2.

(2) One married earner households are households with one earner where the earner is married and the spouse is a non-earner.

TABLE 10

THE DISTRIBUTION OF NET BENEFITS BY HOUSEHOLD TENURE, U.K. 1971

Household Tenure	Owner		Rented		All
	Outright	Mortgage	Public Authority	Private	
No. of Households	1,451	1,946	2,269	1,573	7,239
% of Households	20.0	26.9	31.3	21.7	100
Average Original Income	1,641	2,647	1,459	1,401	1,802
	(18.3)	*(39.5)*	*(25.4)*	*(16.9)*	*(100)*
Average Gross Income	1,889	2,736	1,698	1,591	1,992
	(115.1)	(103.4)	(116.4)	(113.5)	(110.5)
	(19.0)	*(36.9)*	*(26.7)*	*(17.4)*	*(100)*
TOTAL ALLOCATIONS					
Expenditures	839	927	1,116	814	944
	(51.1)	(35.0)	(76.5)	(58.1)	(52.4)
	(17.8)	*(26.4)*	*(37.1)*	*(18.3)*	*(100)*
Taxes	899	1,081	708	689	842
	(54.8)	(40.8)	(48.5)	(49.2)	(46.7)
	(21.4)	*(34.5)*	*(26.3)*	*(17.8)*	*(100)*
Net Benefits	−60	−154	409	125	102
	(−3.7)	(−5.8)	(28.0)	(8.9)	(5.6)
CSO ALLOCATIONS					
CSO Expenditures	411	346	548	389	432
	(25.1)	(13.1)	(37.6)	(27.8)	(24.0)
	(19.1)	*(21.5)*	*(39.8)*	*(19.6)*	*(100)*
CSO Taxes	666	925	610	577	699
	(40.6)	(35.0)	(41.8)	(41.2)	(38.9)
	(19.1)	*(35.6)*	*(27.4)*	*(18.0)*	*(100)*
CSO Net Benefits	−255	−580	−62	−188	−267
	(−15.5)	(−21.9)	(−4.3)	(−13.4)	(−14.8)

Notes:

(1) The first entry in each cell is the average value in pounds per year of the income, expenditure or tax to households in each decile; the bracketed entry expresses this figure as a percentage of decile average original income and the italicized figure indicates the percentage of the income, expenditure or tax received in each decile.

(2) Original income is total household income before the addition of any cash transfers or the subtraction of any taxes; gross income is original income plus cash transfers.

(3) The private rented category includes a small number of households living in rent-free accommodation.

Conversely, the tax data show that while mortgage-owners pay the largest absolute amounts of tax this represents a smaller proportion of their income than is the case with the other groups. The detailed tax data (unpublished) show that this is the result of each tax being a less than average proportion of their income; in this case the normal regressiveness of most of the taxes is not offset or overcome by a progressive income tax and this presumably reflects the fact that mortage interest payments are an allowable relief on taxable income. In consequence of the relative undertaxing of homeowners with mortgages, each of the other three tenure groups has a higher share of tax payments than of original income, though for public sector tenants the tax share is lower than their gross income share.

Public sector tenants have the largest net benefits, both absolutely and relatively, and the data demonstrate the lack of favour which is shown to private sector tenants. Despite having the lowest original incomes, they receive only slightly more than average net benefit, or less than one-third the net benefit of the public tenants. Their tax payments are similar, so the difference is primarily on the expenditure side; the unpublished detailed data show that about two-fifths of the overall expenditure difference arises because of the absence of any housing benefits for private tenants, with a further 30 percent coming from education and income maintenance differences, and most of the remainder coming from the unallocables.

Comparison with the CSO allocations shows the total tax figures to be slightly less progressive and the total expenditure allocations markedly less progressive than their CSO counterparts. For example, while the move to the total allocations causes the expenditure benefits as a percentage of income to double for the other three tenure types they increase by a factor of 2.7 for owners with mortgages. Much of this, however, reflects the impact of the distribution of unallocable expenditures on the population basis. A comparison of results on the three bases (not shown here) shows that the population and income bases favour owners with mortgages, but the capital income basis overwhelmingly favours outright owners, giving them almost three-fifths of the unallocable expenditures, and is particularly unfavourable to public sector tenants who receive only about one-twelfth of the benefit.

The choice of assumption in dealing with unallocables is therefore of some importance in considering the results of redistribution by household type. Nonetheless, even allocable public expenditures are distributed less progressively than the CSO suggest, and, whichever of the unallocable assumptions is used, it is clear that owners with mortgages fare rather better and private tenants somewhat worse than their respective incomes might have led one to predict.

7. Income Redistribution: Comparing the U.S. and the U.K.

In this paper and that in the previous issue of this review, we have examined for both the United States and United Kingdom the distributional impact, with respect to household income, size, and numbers of workers, of public expenditures and taxation, and the consequential patterns of net benefits. This conclud-

ing section compares and reflects upon these results, which were, in many ways, strikingly similar.

In both cases, public expenditures represented a declining proportional addition to income as income increased, but the absolute value of expenditures only varied slightly with income. The U.S. data showed a slight tendency for households in the bottom quintile to receive slightly less than average expenditures whereas they received exactly equal shares in the U.K., but in both countries households in the higher deciles and especially the top decile received a little more than average.

The detailed expenditure items in each country vary from the overall expenditure patterns. Thus the tendency of many U.S. benefits to rise in absolute terms as income increases is countered by a few expenditures, such as health and social security and public assistance, which are especially important even in absolute terms in the lower half of the distribution. In the U.K., income maintenance expenditure performs a similar role in offsetting expenditures such as education and roads.

The two countries are similar in the rising absolute value of U.K. education and U.S. schooling expenditures as income rises, but the presence of relatively large numbers of student households in the bottom U.S. decile gives one element of U.S. education funding (higher education) a redistributive appearance not evident in the U.K. data. American public expenditures on health are very much more focussed on the poor than is the British national health service. In the U.K., health expenditure increases slightly with household income, since the correlation between household size and income outweighs the greater value of the expenditures attributed to the old but smaller households who predominate in the bottom two deciles.

While income maintenance expenditures in both countries are of greater absolute and relative importance in the lower half of the distribution, in America it is the third decile which derives greatest benefit from social security and public assistance, followed by the second, fourth and fifth. Only the top two deciles receive less than the bottom decile, an apparent curiosity which is explained by the large numbers of students, unemployed persons without dependants and public hospital patients in the bottom decile. In the U.K., those in the bottom decile receive most, and the amount declines consistently through the deciles. The divergence between the two countries may reflect the dominance of pensions in U.K. income support expenditures. They account for around half of such expenditures, are paid on a flat-rate rather than an income-related basis, and although dependents' additions are paid, few pensioners have children or adult dependents other than spouses, and would therefore receive only the basic payments. The apparently greater redistributive element in the British data may therefore be because the payments go so much to pensioners, who tend to be found in the bottom quintile, rather than because the payments are specifically focussed on the bottom quintile.

Among other expenditures, the largest category of expenditures in each country is unallocable expenditure. The residual nature of this category and the uncertainty about how best to allocate it render more suspect any estimate of redistribution. Nonetheless, the application to both U.S. and U.K. data of three

plausible assumptions on the allocation of these "unallocables"—by population, by income and by capital income—once again gave very similar results. We found that the differences in results as between different assumptions are generally smaller than those between any one assumption and the alternative of ignoring completely the unallocables. Further, the differences between the various assumptions, especially in the middle ranges of the distribution, are relatively small; this is particularly the case with the population and income assumptions, where the correlation between income and household size makes the two assumptions less divergent in practice than in theory. Thirdly, of the three assumptions, population—i.e. equal *per capita* allocation—appeared to be most favourable to lower income groups, but was still less progressive than the combined results of the various specific allocations of expenditures. In other words, ignoring unallocables produces an unduly progressive set of results—a point particularly relevant in the U.K. context. It was also the case that in each country the allocation of unallocables according to capital income produced a two-peaked distribution by income decile, with the minor peaks occuring in the second or third decile and the major in the top class. In the U.S., a number of the higher deciles benefitted more than the second whereas in the U.K. only the highest decile did better than the decile with the other "peak"—the third.

The distribution of unallocable expenditures on these three criteria produced less harmonious results in the U.K. when measured against characteristics like household size and number of workers, which implies that the empiricist approach of allocation on alternative criteria still leaves some questions over the results of allocation exercises. One partial remedy for this would be to reduce to the bare core of pure public goods those items included in the unallocable expenditures category: clearer agreement might be possible about the allocation of a smaller range of expenditures—and continuing divergences would be less important.

Our tax side results indicate that overall taxes are approximately proportional in both countries, with U.S. local expenditure taxes somewhat regressive (as is true of domestic rates, the main local tax in the U.K.). The effect of these tax and expenditure patterns is to produce net benefit distributions which are clearly beneficial to those in the lower half of the distribution. With a small positive average net benefit in both countries, the bottom two deciles in each made gains which were greater than their original incomes. Net gains in the third decile were over half, and in the fourth, over one quarter, of original income, with the relative gains being larger in the U.S. in both cases. The gains are a little over 10 percent of original income in the fifth decile in both countries, with the U.K. figure being slightly smaller. U.K. households continue to have a somewhat slower decline in the relative value of gains as income increases, so that they have a slightly larger gain than U.S. households in the sixth decile, and a marginal gain in the seventh decile when the U.S. results show a small net loss. Net losses increase in both countries thereafter, and amount to about 23 percent of income in the highest decile.

Whilst the general "gains followed by losses" picture was to be expected in both countries, the closeness of the patterns in terms of relative magnitudes in each decile and of the location of the crossover point is surprising. Only in

the sharper changeover from gains to losses in the U.S. is there a notable difference between the countries.

Part of the explanation for these similarities lies in the importance of household size as an explanatory variable for the distribution of expenditure benefits. In both countries household size and income are correlated, so that for certain expenditure programmes, most notably education, and for overall expenditures, a significant part of expenditure benefits went to the upper half of the income distribution. One way to increase the progressivity of redistribution with respect to household income would therefore be to restrict the benefits of those public expenditure programmes, whether by a more income-conditioned system of access to benefits, or by taxing the benefits as imputed income. For the latter to be effective, however, a more progressive overall tax system would be required—which would in itself increase the progressivity of income redistribution in both countries.

In conclusion, the basic pattern of the results in these two countries has, thus, been surprisingly similar—especially in view of the geographical, political, demographic and income differences between the United Kingdom and the United States. For the specific expenditure items, this partly reflects the reality that for most public programmes considerations of income redistribution are secondary; policies are designed to benefit the old, families with children, motorists etc., and the results are therefore more easily explained with reference to these factors than to income status. For the taxes, it is explained by the combination of progressive and regressive elements which produce effectively proportional taxation in each country.

As argued above, we believe that redistribution can be fully understood only in the context of a wide range of socio-economic and demographic variables. Nevertheless, as our various assumptions concerning the distribution of benefits from unallocable expenditures show, the pattern of redistribution we have observed seems to be fairly robust; in other words it varies rather little with small changes in specifications or assumptions. Therefore, although the details of tax and expenditure programs in the U.S. and the U.K. differ considerably, their overall redistributive impact appears to be remarkably similar.

Appendix

Expenditure and Tax Allocations: Assumptions and Methods

In Table 1, we set out the amounts of various expenditure and tax items which we had allocated and compared these amounts to those resulting from the CSO allocations. Here, we provide details of the extra amounts we allocated, outline the assumptions which underlay the allocations and describe the particular method of allocation used in each case.

Our source for the aggregate figures for the various revenue and expenditure items was the U.K. national accounts and the following discussion cites aggregate amounts and generally follows the national accounts descriptions in order to facilitate the interpretation of our household level data in the light of national accounts totals. In grossing-down national accounts aggregates to our sample we used either of two methods, as appropriate. First, data on the number of

earners, households, persons, car owners, etc. in the population were used to calculate average values per person, car owner etc. for certain expenditure variables. Second, national accounts totals for items such as consumer expenditure and capital income were used to calculate the relative magnitude, at aggregate level, of certain expenditure and tax variables; these aggregate relativities were then used to calculate the specific impact on particular households.

For some variables "grossing-down" was unnecessary either because the survey data measured the impact of the variables on households (e.g. income tax, social security) or because the CSO allocations to individual households were available on our data-tape (e.g. health, direct expenditure taxes). We accepted the CSO allocations as far as they went but have felt it proper in the following notes explicitly to identify them and, for the sake of completeness, to outline briefly the allocation method they used.

Expenditure Variables

Social security benefits of £4,069 million (including social assistance payments etc.) were allocated to social security recipients and assumed to be reflected in the amounts of social security received by members of the FES sample. We allocated the £212 million administrative costs of the social security system as 212/4,069 of cash benefits received; the resulting amounts were not, however, included as part of the income maintenance variable but were included as a separate item in the all allocable public expenditure figures.

Current expenditures of £2,430 million on education are allocated by the CSO by assigning the average cost to public authorities of a variety of types of educational establishment to households containing persons attending such an establishment. We assigned £234 million of capital expenditure as 234/2,430 of current education expenditure benefits; the remaining £234 million of capital expenditure on education was regarded as unallocable.

Health service current expenditure on goods and services of £2,054 million is assigned by the CSO on the basis of estimates of the differential use of the health services made by individuals categorised by age and sex. The remaining relevant expenditure of £193 million is primarily capital expenditure; £96 million was allocated as 96/2,054 of current health expenditure benefits and £97 million was regarded as unallocable.

Subsidies to public authority tenants account for £332 million and are allocated by the CSO to those tenants as the difference between actual rent and an estimated "economic" rent. We allocated £42 million of improvement grants equally to owner-occupiers (whether outright owners or mortgage-holders), £16 million of option mortgage subsidy equally to those with mortgages and £335 million (50 percent of gross domestic capital formation) equally to public authority tenants. The remaining £345 million of housing expenditure was unallocable.

We allocated all £319 million of current and £260 million (or 50 percent) of capital expenditure on roads and public lighting. Following "the pattern of expenditure on vehicle fuels" (Peretz, 1975, p. 7) half of this total was allocated

in proportion to car ownership, and half in proportion to total household expenditure. The rest of capital expenditure (£260 million) was unallocable.

All current expenditure on water supply and sewerage (£70 million) and on refuse collection and disposal (£122 million) and 50 percent (£142 million) of capital expenditure was allocated. Following Peretz (1975, p. 7), 25 percent of water and 50 percent of refuse expenditure was assumed to be a direct benefit to households and was allocated to them weighted by $(1+N)$ where N is the number of persons in the household; one-third of allocable capital expenditure was similarly allocated. The remaining allocable current and capital expenditure (£209 million) was assumed to be passed on to households via lower production costs and was therefore allocated in proportion to household expenditure.

£76 million of employment services and premium expenditure is redundancy pay and is recorded in the Family Expenditure Survey. In the text we regard these expenditures as part of the income maintenance variable. The other £222 million which we allocate includes the remaining £93 million of relevant expenditure on employment services in the national accounts and £129 million of "other industry and trade expenditure" which represented subsidies to employers in the form of employment premiums. The £222 million was assumed to benefit economically active persons, and £111 million was allocated to them equally with the other £111 million allocated in proportion to earnings.

It was possible to identify specific groups for whom £112 million of current expenditure on personal social services was intended. £62.1 million was on the elderly, and was allocated in proportion to the number of men over 65 and women over 60 in each household; similarly £38.7 million for children and £11.2 million for infants was allocated in proportion to the numbers of those under 16 and under 5 respectively. £198 million of current and capital expenditure was unallocable.

Expenditure of £159 million on school meals, milk and welfare foods was allocated by the CSO to households receiving these benefits as the average cost of the benefit less any contributions made by the household.

Agricultural price subsidies costing £295 million and £34 million of capital grants to farmers were allocated to households headed by a farmer in proportion to the household's income from self-employment (which was taken to represent income from farming). £165 million of agricultural expenditure was unallocable.

Compensation to the gas and electricity industries for price restraint cost £45 million; £24 million of this was allocated to households in proportion to their expenditure on fuel, light and power, and £21 million was assumed to be passed on in lower production costs and was therefore allocated in proportion to household expenditure. £304 million or 50 percent of government's capital grants to the private sector of industry and trade was assumed to benefit capital owners and allocated in proportion to capital income. Other industry and trade expenditure of £718 million was unallocable.

Transport subsidies cost £96 million, and although £41 million of this was a direct subsidy to consumer expenditure on travel our data are not adequate to allow this to be allocated directly to households in proportion to travel expenditure. Consequently, all of the £96 million is treated as a general subsidy to consumers expenditure and allocated to households in proportion to their

expenditure. The other £89 million of relevant transport and communication expenditure is unallocable.

Apart from the unallocables mentioned above, all relevant expenditure on defence, external relations, research, public health and environmental services, libraries, museums and the arts, law and order and protective services and parliament, tax collection and miscellaneous public administration was treated as unallocable. The resulting total of £7,333 million of unallocable expenditure was then allocated, as discussed in the text, on each of the three bases of population, income and capital income in order to estimate the range of results generated by these plausible allocation assumptions.

Tax Variables

Income tax, surtax and employees national insurance payments were assumed to be incident upon the person with statutory liability and reflected in the amounts recorded as paid by the members of the FES sample. Similarly, domestic rates (a residential property tax) was assumed to be paid by home-owners and home-renters as reflected in FES data. It is calculated net of any rebates to low-income householders.

Two alternative assumptions about employers national insurance were used. When this tax is assumed to be incident upon earners, a total of £1,453 million is allocated; as the FES records the amounts of employers national insurance paid for a particular worker this amount was accepted as the microrepresentation of the aggregate. A logical consequence of this assumption is that pre-tax earnings (and thus original incomes) are increased by the amount of the employers contribution whilst post-tax earnings are unchanged. We did not make this adjustment in these tables, partly because we have presented the data in such a way that it can easily be made by the interested reader, but mainly because we have not used this assumption as our basic assumption in the analyses. Consequently, although it is technically incorrect to present figures for employers national insurance contributions (earnings assumption) as a percentage of un-adjusted household original income for categories of household, we have done so in Tables 5 and 8 in order to illustrate the magnitude and incidence of the tax, on this assumption, relative to other taxes.

If it is assumed that employers national insurance payments are passed on by employers in higher prices then the aggregate figure to be allocated is £1,124 million, or £329 million less than under the earnings assumption. This is because £329 million is assumed to affect and be paid for from the prices facing non-resident consumers of U.K. produced goods. Of the £1,124 million, £591 million is assumed in the national accounts to fall on personal consumption and is allocated to households by the CSO using input–output tables and the FES details of household expenditure patterns. The national accounts indicate that £273 million of employers national insurance payments are assumed to fall on gross domestic capital formation, while the remaining £260 million falls on general government final consumption. We assumed that the final incidence of the former was half on capital through a lower rate of return and half on consumer expenditure through higher prices and, accordingly, allocated it in equal parts

in proportion to capital income and consumer expenditure. We assumed that had general government final consumption not had to bear the £260 million in employers national insurance, the price of government services, i.e. taxes, would have been lower. Accordingly, we have allocated the £260 million in proportion to total taxes paid before taxes falling on general government final consumption are included. (This implies a proportion at aggregate level of 260/18,084.)

Corporation tax (including capital taxes paid by corporations) was assumed to fall half on capital and half on consumption and thus was allocated half in proportion of capital income and half in proportion to household expenditure.

Capital taxes were assumed to fall on owners of capital. In any one year only some capital owners might be affected, but we assume that our allocation of these taxes to capital income is a reasonable reflection of the average incidence over a period of years. Nonetheless we regard this and all taxes falling on capital income as being inadequately reflected in our data because of the considerable, and possibly skewed, underestimation of the value of capital income in the FES.

The CSO allocate £4,641 million of expenditure taxes directly to consumer expenditure and £1,154 million of commercial rates (the tax on business property), expenditure taxes, selective employment tax and other and miscellaneous taxes to consumer expenditure via their effects on production costs (using input–output analyses). They do not allocate the £1,463 million of these combined taxes which the national accounts assume to fall on gross domestic capital formation and general government final consumption. In accordance with our earlier assumptions with respect to similar elements of the employers national insurance contribution, we have allocated the £783 million falling on capital formation half to capital income and half to consumer expenditure, and the £680 million falling on general government final consumption in proportion to total taxes paid.

For a review of the methodological debate in the U.K., see O'Higgins (1980).

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