Journal of the Statistical & Social Inquiry Society of Ireland, Vol XXV, Part I

THE IMPACT OF STATE TAXES AND BENEFITS ON IRISH HOUSEHOLD INCOMES

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(Read before the Society 23, February 1984

INTRODUCTION

Outline of Paper

In recent years the Central Statistics Office (CSO) has published detailed analyses of the redistributive effects of State taxes and social benefits on household incomes in 1973 and 1980 based on the results of largescale national Household Budget Surveys (HBS) Some methodological issues and qualifications relating to the CSO analyses are first discussed The 1980 analysis is then looked at in some detail concentrating mainly on special classifications of the results which were not provided in the published report The earlier 1973 national analysis is considered next and the changes which occurred in the degree of redistribution between 1973 and 1980 are examined Following this, previously unpublished results of urban analyses based on the 1974-79 smallscale continuing urban HBS are presented The paper concludes with an analysis of the degree of progressivity/regressivity of different taxes and benefits and how this has varied between 1973 and 1980

One of the main purposes of the paper is to outline the range of data which is currently available and the extent of analysis which is possible In this context it is worthwhile reminding interested parties that it is possible for them to complete analyses based on the micro data at household level held on computer tape via long standing CSO access arrangements which preserve the confidentiality guaranteed to the respondents who co-operated voluntarily in the HBS

Available CSO Analyses

This paper is based solely on CSO income redistribution analyses Two of these were published, namely:
(i) 1973 State Analysis: This was the first analysis which was officially published. It was largely an experimental study, published in January 1980, based on the results of the largescale national HBS undertaken in 1973. The experience prompted a number of extensions to the coverage of the HBS (e g identification of the health eligibility category of individual household members) to facilitate the allocation of certain non-cash benefits

(ii) 1980 State Analysis: This latest analysis was published in September 1983 based on the results of the 1980 largescale national HBS The methodology was

identical to the 1973 analysis, but it benefitted from the extensions made to the HBS coverage following the 1973 analysis.

A number of unpublished internal CSO analyses are also available, namely:
(iii) 1974-79 Annual Urban Analyses: Experimental analyses based on the results of the 1974-79 smallscale annual HBS which have been completed, but not officially published. The usefulness of these urban analyses is limited because of the relatively small household samples on which they are based. These annual samples varied between 1,600 and 2,000 households and this considerably restricts the degree to which the results can be classified.

Although the smallscale annual HBS was reintroduced following the 1980 national HBS it was terminated in 1982 in response to Government economy measures.

Scope of the CSO Analysis

The CSO analysis provides an assessment of two contrary flows of resources during a particular period i.e. taxation payments from households to the State and the reverse flow of the cost of the benefits provided by the State to households It must be emphasised immediately that on the benefit side the purpose is to determine where government expenditure goes (i.e. apportionment of the cost of State benefits and not the actual welfare or benefits accruing to the recipients The balance between taxes paid and cost of benefits received is taken to represent the extent to which household income is redistributed by State intervention. Being cross-sectional studies these analyses are not designed to assess the redistributive impact of taxation and social welfare benefits in terms of lifetime or permanent income concepts favoured in economic literature, and they clearly cannot provide any insight into lifetime or intergenerational income redistribution.

The unit covered in the analyses is the household. Although this choice is determined by the use of the Household Budget Survey data, it is in practice the only realistic unit for which estimates of income can be made. The use of the individual or tax unit would present serious problems, particularly in allocating benefits within households.

The coverage of taxes and benefits (and their allocation and valuation as discussed later) in analyses of this type presents many conceptual and practical difficulties. There is, in fact, no generally accepted basis for covering all taxes and benefits. As explained in the published reports the CSO analyses are restricted to those taxes and State expenditure of a social welfare nature impinging directly on households.

Coverage of Tax Payments

The following categories of tax are covered, namely:
(i) Direct tax, i.e. income tax and the employee share of social insurance contributions as stated by respondents in the HBS;
(ii) Indirect tax, i.e. the estimated VAT and duty content of household

expenditure, motor taxation, rates (up to 1978) and licences as reported in the survey.

No account is taken of the taxes paid by the business sector such as company taxation, employers' share of social insurance contributions, rates on business premises, road tax on commerical vehicles, etc. which are passed on in the form of increased prices to the consumer and lower wages to employees, or absorbed by business owners or share-holders as lower profits The taxes covered in the analysis represented about 68 per cent of public authorities income from taxes and 38 per cent of their total revenue (including borrowings) in 1980.

It should be noted that the CSO analysis does not separately distinguish the extent to which households benefit from income tax allowances and reliefs which play an important role in social policy However, these implicit social benefits (termed "tax expenditure" in the literature in contrast to the explicit "benefit expenditure") are reflected in direct tax payments and, therefore, are fully taken into account in the distribution process.

Coverage of State Benefits

The State expenditure allocated to households in the CSO analysis is restricted to the following direct social welfare benefits:

(i) Cash benefits, i.e. unemployment benefit and assistance, old age pensions, children's allowance and all other direct cash transfers from the State;

(ii) Non-cash benefits, i.e. housing, education, health, social welfare, subsidies and other services which directly benefit particular individuals and households and which can be realistically assessed.

No account is taken of Government expenditure on general community services such as fire service, museums, libraries, parks and other amenities benefitting the public in an environmental or cultural sense (for which no usage information is available for even an approximate allocation to individual households); central and local administration, defence, Gardai, justice and other services necessary for the proper functioning of the country (which may not generally be considered by some people as conferring specific social benefits on them); capital expenditure on the building of schools, hospitals, roads, etc; industrial development; housing grants; etc. (which will benefit the public in the future through provision of better services, improved job opportunities, etc.).

The benefits allocated covered approximately 54 per cent of the current expenditure and 40 per cent of the total expenditure (i.e. including capital) of public authorities in 1980.

Possibilities of More Extensive Coverage of Taxes and Government Expenditure

Ideally, analyses of this type should cover the bulk of government revenue and expenditure. On the revenue side it should probably be restricted to tax receipts

excluding borrowing and other (e.g trading) income Similarly, current Government expenditure should only be covered although it could be theoretically argued that account should be taken of the current benefit accruing from past capital expenditure. This could hardly be contemplated empirically.

In practice the coverage of business taxation revenue and general government expenditure excluded from CSO analyses presents very serious and conceptual difficulties. Academic, rather than official government studies, have attempted to make some allowance for these omissions. Most of these related to the US and Canada, see Gillespie (1965) and Musgrave et al (1974). They have in the main taken the form of sensitivity studies providing results based on different incidence assumptions. For example, in case of general government expenditure (e.g. defence, police, etc.) benefits have been alternatively allocated to households as follows:

(i) in equal amounts (which improves the relative position of the less well off households;
(ii) proportionally to income (which maintains the existing income distribution);
(iii) proportionally to capital income (on grounds that many such services protect property); etc.

The results obtained are clearly sensitivie to the choice of assumption and the underlying problem is not really resolved. A utility function type approach proposed by Aaron and McGuire (1970) avoids this problem, but its informational requirements are very demanding and the underlying assumptions have been questioned, see Brennan (1976).

In the light of these methodological uncertainties and practical difficulties the CSO took the pragmatic decision to exclude business taxation and general government expenditure from its analysis. Those interested in sensitivity analyses based on various assumptions are referred to in the study by O'Higgins and Ruggles (1981) based on the UK Income Redistribution Analysis which is essentially the same as that undertaken by the CSO. This study illustrates the ad-hoc nature and underlying uncertainty of the various possible combination of assumptions necessary to extend the existing coverage of taxes and benefits. Interesting reviews of these and other methodological problems are given by O'Higgins, (1980) and Boreham and Semple, (1976).

METHODOLOGICAL MATTERS

Coverage of Household Income

The concept of direct household income, (i.e. prior to State intervention via taxation and provision of benefits) in the CSO income redistribution analysis is defined to include all money receipts of a recurring nature which accrue directly to the household regularly at annual or more frequent intervals, together with the value of any free goods received by household members and the retail value of own farm or garden produce consumed by the household before the deduction of taxes or the

addition of cash benefits paid by the State No account is taken of receipts which are generally of an irregular or non-recurring nature

The principal exclusions are receipts from sale of possessions, withdrawals from savings, loans obtained, loan repayments received, windfalls, prizes, retirement gratuities, maturing insurance policies, etc Gross (addition of State transfers), and disposable (deduction of direct taxes) and final (addition of non-cash benefits and deduction of indirect taxes) household income concepts are also distinguished.

Particular account must be taken of how different income sources are surveyed in the HBS. Current receipts are taken in the case of wage/salary earners and pension recipients with some difficulty being experienced in the determination of gross amounts from the known net receipts. In national surveys the CSO maintains special twelve-month accounts in the case of largescale rural farmers, with farming income being estimated on the basis of data collected at a single interview in other cases. Details for the most recent twelve-month period for which accounts or information is available have to be accepted in the case of other self-employed, investment and property incomes with no adjustment being made to update these lagged figures to relate to the survey reference period. Social Welfare receipts are surveyed on a current basis like wages/salaries and no account is taken of how long these payments are received or of the income of recipients from employment during other periods of the year A full appreciation of these survey aspects and related qualifications is necessary for a proper interpretation of the resulting income estimates.

It should also be noted that the HBS extends only to private households. The resulting income estimates, therefore, exclude the income of all persons who are not resident in private households, e.g. military barracks, convents, monasteries, hospitals, nursese homes, long stay medical institutions, boarding houses, etc.

Limitations of HBS Income Results

At the outset it must be emphasised that income is a subsidiary aspect of the HBS which is predominantly concerned (as its title states) with the coverage of household expenditure. However, the income results are a very useful by-product despite the extensive qualifications which the CSO attaches to them in its published reports.

All limitations stem from the fact that the HBS is a direct sample survey and the estimates derived from it are subject to sampling and non-sampling random errors and biases Estimates of the random error content of the 1973 and 1980 samples estimates are provided in the relevant HBS reports. Other than warning that the accuracy of the sample estimates are directly related to the number of sample households on which they are based, I move on immediately to consider the problems presented by some of the non-sampling biases, particularly those affecting the income results.

The first consideration in this regard is the relatively low level of response in the HBS In the 1980 survey, 56% of the sample households which are canvassed agreed to co-operate. The reason for this, of course, is the burden of participation, the coverage of income and the necessity for all household members aged 15 years and over to co-operate. Response is lowest in urban areas and highest in rural non-farm households. The burden of maintaining twelve-month farm accounts is clearly evident in the case of farm households

Differential response by various types of households would significantly bias the HBS results without some adjustment. The CSO tackles this problem on two fronts, namely by:

(i) controlling regional and urban/rural numbers of co-operating households and the incidence of rural farm and non-farm households during fieldwork;

(ii) reweighting survey results to agree with the Census of Population distribution of households classified by household size, social group of head of household, town size (urban areas) and farm size (rural areas).

This approach removes the bulk of differential response bias, but it cannot fully take account of all factors such as response variations by income (not completely reflected by social group) or household type (i.e. households with children more likely to co-operate than those with an equivalent number of adults). In fact, in the 1980 survey there is still after reweighting an over-representation of children under 14 years and an under-representation of males aged 21-44 years and both males and females aged 45-64 years.

A second problem is the traditional understatement of expenditure on alcoholic drink which affects the estimation of indirect taxes No information is available on the possible variation of understatement by different types of persons and, using National Accounts personal expenditure estimates, separate global adjustments are made to the expenditure on beer, spirits and wine at individual household level for the purpose of the income redistribution analysis

A third consideration, which is particularly relevant when gross annualised figures are derived from HBS weekly income estimates, is how the HBS sample is distributed over the reference year Departure from proportionate distribution of different types of households throughout the year distort annualised estimates In the 1980 HBS the scale of field work had to be escalated on a phased basis from the existing smallscale operation This arose because of the large number of extra Interviewers who had to be specially appointed, intensively trained and introduced to supervised fieldwork in the Dublin area As can be seen from Table 1 the fieldwork was concentrated in the thirteen month period from November 1979 to November 1980 with 35 per cent of the sample surveyed by the end of March 1980 This early - 1980 skewness to the sample coverage was more pronounced in urban areas because of the initiation of new Interviewers in Dublin and the necessity to delay the household phase of the survey in country areas until farm accounts had first been initiated for constituent largescale farm households by a separate team of Farm Accounts Surveyors. It follows that the calendar structure of the 1980 HBS sample leads to the under-estimation of grossed annualised 1980 household income estimates where payment rates increased during the year, e.g wages, salaries and social welfare benefits.

Table 1: Percentage Monthly Distribution of Sample Households in 1980 HBS

Survey Area	1979 11 12	1980 1 2 3 4 5 6 7 8 9 10 11 12	TOTAL SAMPLE
Town*	3 10	15 9 9 5 4 6 5 4 9 9 8 4	100
Country	1 2	5 8 10 10 11 11 4 10 9 7 8 4 1	100
All	2 6	9 8 10 8 8 10 8 7 8 8 6 2	100

* in towns with 1,000 or more inhabitants

The greatest problem, of course, is the understatement of income which characterises all direct income surveys of the HBS type A certain proportion of this may well be unintentional since why should people participate in what is a voluntary survey if they are not willing to provide accurate income details. Some of the reasons for understatement are known. As mentioned earlier, wage/salary earners sometimes have problems in determining their gross earnings from known net take-home pay and the self-employed generally can only provide details relating to earlier periods Non-sampling errors also contribute substantially, e g the under-representation of adults and the early 1980 skewness of the 1980 HBS sample already described Undisclosed income sources and income understatement in tax avoidance situations are, of course, inevitable. Unfortunately, there is no reliable basis for determing the extent of income understatement or, more importantly, the degree to which it varies between different income sources and types of households. One approach is to compare total income with total expenditure. Expenditure exceeds income at all levels. Although this substantiates the existence of understatement to some degree, it really throws no light on the situation because of the two concepts are not directly compatible, particularly in respect of the financing of household expenditure from borrowings, savings, capital gains, retirement gratuities, redundancy lump sums, back money on wage agreements, etc. not covered on the income side

Another suggestion for assessing the degree of income understatement is comparison of grossed annualised HBS income estimates with personal income aggregates in the National Accounts. However, such comparisons at the overall level are simply not valid and they are not possible for most constituents because of differences in definitions and coverage. This has been recently demonstrated by Atkinson and Micklewright (1983) in the case of the UK. For example, sizeable differences emerge in a direct comparison in the case of the following two categories:

(i) self-employed income: because respondents can only be requested to provide details for the most recent twelve-month period for which information is available, this period is generally one or two years prior to the HBS reference year

(ii) investment income: due to the fact that the National Accounts figure includes the considerable amount of income accruing to pension funds, etc. because it is technically considered to be the property of the private sector.

Even in the case of wages and salaries where some reasonable comparison might be expected, adjustments have to be made for the institutional population, e g military barracks, nurses homes, boarding homes, etc , and pension contributions must be excluded from the National Accounts figure. Understatement of income in the HBS clearly limits the extent to which the data may be used and the confidence which can be attributed to the results of any income analysis based on the survey However, this deficiency should not be over-exaggerated particularly since no other source of household income information is available.

Estimation of Tax Payments and Benefits received

Direct taxes in the CSO analysis are based on the actual payments reported by sample households in the HBS The income tax in the case of self-employed earnings and investment income related tothe most recent twelve month period preceding the survey for which information was available. This element of direct taxation is, therefore, subject to the same time-lag already noted in respect of self-employed income Indirect taxes are taken to be amounts actually paid by households, e.g. motor tax, licences, or are assumed to be fully incorporated in retail prices and estimated by applying the appropriate VAT and duty rates to the relevant item expenditures reported in the HBS (after adjustment for under-statement of expenditure on alcoholic drink)

The assumption that direct and indirect tax is fully borne by households may be criticised on the grounds that no account is taken of how tax may be shifted, i e. its real incidence being spread in varying proportions between employers in the form of reduced profits, employees as lower earnings and consumers in higher prices. However, a considerable gap exists between the shifting theory and its application, and there is no realistic alternative at present but to assume that the full tax burden is borne by the consumer, see McClure and Thirsk (1975) for an indication of the complexities involved.

Benefits are estimated as far as possible on the basis of what individual households actually receive. This is straight forward in the case of cash benefits which are surveyed directly in the HBS. The valuation and incidence of non-cash benefits, however, raise some contentious issues. The first problem is the valuation of State benefits. As emphasised at the outset the CSO analysis is concerned only with assessing the cost to the State of providing various benefits to households. Another approach would be to determine the utility-value which the public places on the benefit received, but this is an area where there is again a big gap between theory and practice

The second problem is the apportionment of the cost of State benefits to individual households Two main approaches have been used by the CSO. One is to allocate the average cost of benefits continually provided to identifiable recipients in the HBS, e g. education, free public transport. The other approach is to average the cost of services over all eligible persons in the population and to attribute this amount to all such persons in HBS sample households. This latter approach is used where no

information is available on the extent to which such services are used by household members, e g. health services Refinements are made where possible to allow for known variations by age, sex, region, etc.

Income Inequality Measures

Details of quintile shares and the ratio of top/bottom quintile incomes to the median income based on exact decile distributions incorporating the HBS reweighting for differential response are used to give an overall view of the differences between various income distributions. However, there are also many measures of income inequality which condense all facets of an income distribution into a single value or coefficient All such summary measures are subject to obvious limitations and must be interpreted with caution They reflect the degree of inequality in an income distribution arising from all causes which, for example, in the case of household incomes include variations in size, life cycle, number of earners and other income related characteristics. Small differences should not be considered significant particularly when based on sample data as in the present instance

These summary measures record perfect equality when every unit has the same income Since such a situation is neither possible nor necessarily desirable this traditional standard of equality has been criticised particularly by Paglin (1975) who maintained that life cycle income variations should be excluded in order to distinguish the basic underlying level of income inequality. Problems also arise in comparing different sub-populations or different periods because these summary inequality measures are affected by differences in income related demographic factors. Allowance for these problems can be made by decomposing the global inequality measure to isolate the inequality creating effects of different factors. Nolan (1981) applied this approach for this country using the 1973 income redistribution analysis. Using the published results he was restricted to segregating the effects of only household composition on direct income inequality. This approach is extended in this paper to other income related factors, e.g. life cycle, age of head of household, number of earners, for both direct and final household income.

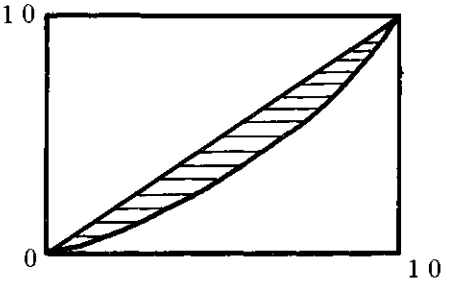
Two summary inequality measures are used namely:

(i) Gini Coefficient. this Coefficient is used because it is the most widely applied measure of income inequality. It is usually defined by reference to the Lorenz curve This curve plots the cumulative proportion of income units in increasing income order against their cumulative proportionate share of total income.
The Gini coefficient is defined as:

$$G = \frac{\text{Shaded Area}}{\text{Area under diagonal}} = 1\text{-}2 \text{ Area under Lorenz Curve}$$

and ranges in value from 0 (perfect equality) to 1 (complete inequality)
For grouped data all incomes in any range are assumed equal to the average income and the Gini coefficient is estimated using the formula

Figure 1.



$$G_g = 1 - \sum_{i=4}^{k} \frac{n_i}{r} (S_i + S_i - 1)$$

where K = number of income ranges,

n_i = number of households in the range

S_i = cumulative proportionate share of aggregate income in income ranges 1 to i (ranked by income level)

For discrete income data the corresponding formula is

$$G_d = \frac{1}{n} \sum_{j=1}^{n} \left\{ (j-1)\, S_j - {}_j S_j - 1 \right\} \text{ or } 1 - \frac{1}{n} \sum_{j=1}^{n} \left\{ S_j + S_j - 1 \right\}$$

where n = total number of income recipient units (7,185 in 1980 HBS),

S_j = cumulative proportionate share of aggregate income held by income recipients 1 to j (ranked by unadjusted income level)

For HBS sample data the distributions of both households and incomes must incorporate the proportionate adjustment made for differential non-response.

(ii) Theil Coefficient· the Thiel inequality coefficient is used because of its importance as the only measure shown by Shorrocks (1980) and Bourguignan (1979) satisfying certain desirable inequality measurement criteria which can be decomposed into between - group and within - group components There are, in fact, two separate Theil coefficients which differ in respect of being income-weighted and population-weighted decomposable. Although Shorrocks opts for the latter we use the former as it is the customary formulation used in the literature, namely:

$$T_d = \sum_{d=1}^{n} \frac{y_j}{n\bar{y}} \cdot \log_e \left(\frac{y_j}{y} \right)$$

where n= total number of income recipient units,
y= income of the jth unit, y= average income of all units

This coefficient ranges in value from 0 to log n. For discrete HBS data the household distribution must incorporate the proportionate adjustment for differential response.

In the case of calculations based on grouped data it is again assumed that all incomes in any range equal the average income and the Theil coefficient is estimated using the formula:

$$T_g = \sum_{i=1}^{K} \frac{n_i \bar{y}_i}{n\bar{y}} \cdot \log_{10}\left(\frac{\bar{y}_i}{\bar{y}}\right)$$

where K=number of income ranges,
N= number of households in 2nd range
Y_i= average income in ith range.

If the population is divided into g mutually exclusive and exhaustive groups the Theil coefficient is decomposed as follows

$$T = \sum_{i=1}^{g} \frac{ni\,\bar{y}i}{n\bar{y}}\, T_i + \sum_{i=1}^{g} \frac{ni\,\bar{y}i}{n\bar{y}}\, \log_{10}\left(\frac{\bar{y}_i}{\bar{y}}\right)$$

where T_i =Theil Coefficient for ith group

Unlike this Theil coefficient the Gini inequality index does not decompose naturally into intra- and inter-group terms, a third term arises due to the overlapping of incomes in groups. In this regard it is interesting that Murray (1979) has shown that the special Gini index proposed by Paglin (see earlier) to remove variations in income due to age or life cycle is equal to the ordinary Gini index less the inter-age group component term referred to above All decompositions presented in this paper are based on the Theil coefficient because of its straight forward break-down and interpretation.

'The Gini and Theil coefficients for particular income concepts are consistently estimated on the basis of households classified by the income in question. Hybrid coefficients; e.g for one income concept based on households classified by another, are not presented. All ocefficients are estimated from grouped data. Overall, i.e. State or Urban, decile classifications are used in all instances for this purpose. Note that the maximum value of the Theil coefficient depends on the number of households on which it is based.

The calculation of Gini and Theil coefficients on the basis of grouped income data involves estimation error (inequality within income ranges is assumed to be zero), see Gastwirth (1972) To test the precision of grouped income estimation procedures for Irish data both Gini and Theil coefficient for gross income were specially calculated using the discrete household data Gross income was chosen for this purpose to avoid problems with the Theil coefficient arising from any zero, e g in the case of direct income, or negative, e.g. in the case of disposable or final income, figures which might arise. The results of these calculations for both 1973 and 1980 are compared in Table 2 with the estimates obtained using income distributions based on 5 (quintile), 10 (decile), 20 (quantile) and 60 income ranges, (only for 1980). The discrete household and gross income distributions on which these calculations were based had, of course, to incorporate the proportional adjustments made in the HBS reweighting to correct for differential response. As expected the accuracy of the grouped data estimates improves as the number of groups used

increases The decile-based estimates were, however, considered to be of an acceptable level of accuracy for this paper

Table 2: Calculation of Gini and Theil Gross Income Coefficients on Alternative Basis, 1973 and 1980

	1973		1980	
Calculation Basis	*Gini*	*Theil*	*Gini*	*Theil*
Individual household gross incomes	0 387	0.111	0.393	0 113
Grouped gross incomes.				
5 ranges (quintile)	0 362	0.095	0 368	0.098
10 ranges (decile)	0 379	0 103	0 385	0.106
20 ranges (quantile)	0.384	0.106	0.390	0.109
60 ranges (standard)	*	*	0 392	0.112
Published Reports:				
** ranges (standards)	0.380	0 103	0 385	0 105

* available only for 1980 **= 11 (1973), 13 (1980)

The Gini coefficients calculated from the 11 and 13 income ranges distinguished in the published 1973 and 1980 reports, respectively, are also shown in Table 2 for reference

1980 NATIONAL INCOME REDISTRIBUTION ANALYSIS

General Features

The overall absolute results of the 1980 analysis are summarised in Table 3 for reference purposes. The global redistribution arithmetic was as follows·

	£/week
Direct household benefits	111 14
Cash benefits	14 26
- Direct taxes	-18 95
Non-cash benefits	20.85
- Indirect taxes	-18.31
Final household income	108.99

The average final income emerge as 98 per cent of direct income for the State as a whole reflecting the fact that public expenditure on the benefits covered in the exercise was slightly less than total taxes paid This arithmetic simply sets the scale of the redistribution process, the real interest is in what happens to different types of households

Table 3: Average weekly income, taxes and benefits of all households in State, 1980

Redistribution Process		*Taxes*		*Benefits*	
	£/Week		*£/Week*		*£/Week*
Direct Income	*111 14*	*Direct Taxes*		*Cash Benefits*	
		Income tax	*16 15*	*Childrens allowances*	*1 80*
Cash benefits	*14 26*	*Social insurance*	*2 80*	*Social welfare pensions*	*6 71*
				Unemployment benefits	
Gross income	*125 40*	*Total*	*18 95*	*and assistance*	*2 87*
				Other	*2 88*
- Direct taxes	*18 95*	*Indirect taxes*			
		Rates & water charges	*0 05*	*Total*	*14 26*
Disposable Income	*106 45*	*Motor taxation*	*0 10*		
		VAT	*6 88*	*Non Cash benefits*	
Non Cash benefits	*20 85*	*Fiscal duty*	*10 76*	*Medical services*	*8 19*
- Indirect taxes	*18 31*	*Other*	*0 51*	*Education*	*9 12*
				Housing	*1 00*
Final income	*108 99*	*Total*	*18 31*	*Other*	*2 55*
Direct income				*Total*	*20 85*
– final income	*1 02*				
		Total taxes covered	*37 26*	*Total benefits*	*35 11*

The classification of direct, gross and disposable household incomes used in the published CSO reports are in the form of standard ranges The provision of decile distribution is complicated by the reweighting procedure used in the derivation of results to correct for differential response These are now available Table 4 classifies the 1980 income redistribution results by both direct and final household income deciles The direct income decile classification clearly shows the extent to which income is redistributed from the better-off to the low income households Cash benefits and direct taxes contribute most to this redistribution process. Another significant feature is the close correlation between household size and income level. The ratio of direct to final income (last column of Table 4) shows that the households are better-off after all taxes and benefits in the five lower direct income decile ranges, and worse off in the five highest. The final income decile classification also reveals a number of interesting features. The two lowest deciles are comprised of very small households whereas the two highest deciles are characterised by large households Cash benefits are very evenly distributed, but there is a strong correlation between non-cash benefits and household rankings by final income. The ratio of direct to final income is also much reduced in range with the break-even point occurring between the fourth and fifth deciles.

The overall outcome in 1980 for households classified by all four income concepts, namely direct, gross, disposable and final income is summarised in Table 5. All indicators clearly show that there was a consistent reduction in the degree of inequality as one progresses from the direct to final decile income classification basis. The greatest drop in inequality occurred between direct and gross income which again indicates the significant contribution which cash benefits make to the redistribution process

Table 4 Average weekly income, taxes and benefits of all households in State, 1980 classified by Direct and Final Income Deciles

Deciles	No of Household (adjusted)	Persons Per household	Direct Income	Cash Benefits	Gross Income	Direct Taxes	Disposable Income	Non-Cash Benefits	Indirect Taxes	Final Income	Direct ÷ Final Income
	No	No	£	£	£	£	£	£	£	£	£
Code £ limit											
Direct Income (household)											
1	719	2 599	0 000	34 880	34 880	0 392	34 488	20 173	6 762	47 900	0 00
2 0 000	718	2 377	5 981	29 284	35 264	0 200	35 064	17 006	7 691	44 379	0 13
3 16 167	719	2 740	31 583	20 375	51 958	1 353	50 605	19 135	10 044	59 696	0 53
4 49 406	718	3 353	63 290	12 451	75 741	5 950	69 791	19 034	13 600	75 225	0 84
5 75 225	719	3 687	85 319	9 174	94 492	10 468	84 025	18 800	16 697	86 127	0 99
6 95 943	718	4 146	105 100	8 870	113 970	15 093	98 877	20 457	18 246	101 088	1 04
7 115 385	719	4 180	127 673	7 056	134 729	20 622	144 108	20 105	20 267	133 946	1 12
8 140 839	719	4 387	158 240	7 435	165 675	27 382	138 293	22 683	23 960	137 016	1 15
9 177 582	718	4 464	203 754	6 038	209 792	39 652	170 140	22 573	29 110	163 603	1 24
10 237 787	719	5 270	330 322	7 045	337 366	68 341	269 025	28 508	36 691	260 843	1 27
Final Income (household)											
Code £ limit	No	No	£	£	£	£	£	£	£	£	
1	719	1 681	13 562	12 507	26 068	2 336	23 732	9 475	12 633	20 574	0 68
2 34 123	719	1 892	24 854	17 829	42 829	2 809	39 874	12 163	9 825	42 213	0 59
3 50 909	719	2 397	45 389	19 203	64 592	7 014	57 578	13 680	13 386	57 872	0 78
4 64 675	718	3 046	65 612	15 345	80 958	9 635	71 323	15 572	15 393	71 502	0 92
5 78 470	719	3 514	87 128	13 824	100 952	14 073	86 879	16 779	17 553	86 104	1 01
6 93 552	719	3 987	105 745	12 445	118 190	17 419	100 771	19 503	19 140	101 134	1 05
7 109 362	719	4 386	122 988	12 667	135 655	21 554	114 100	23 886	18 900	119 087	1 03
8 129.354	718	4 793	148 597	13 221	161 818	25 882	135 936	26 715	20 649	142 003	1 05
9 155 582	719	5 373	188 855	13 452	202 307	35 311	166 996	32 275	24 022	175 249	1 08
10 198.216	718	6 133	308 693	12 126	320 819	53 458	267 361	38 439	31 576	274 224	1 13
STATE	7 185	3 720	111 138	14 262	125 400	18 948	106 451	20 848	18 307	108 992	1 02

Table 5: Direct, Gross Disposable and Final Household Income Distributions, 1980

Item Description	*Direct*	*Household Gross*	*Income Disposable*	*Final*
	%	%	%	%
% Income Shares				
Bottom quintile	0 5	4 6	5 2	5 8
Second quintile	8 5	10 6	11 6	11 9
Middle quintile	17 1	16 8	17 2	17 2
Fourth quintile	25 7	24 2	24 0	24 0
Top quintile	48 1	43 8	42.0	41 2
Top decile	29 7	27 0	25 7	25.1
State	100 0	100 0	100 0	100 0
% of Median Income	%	%	%	%
Bottom quintile	-83 1	-56 3	-50 5	-45 6
Top quintile	85 1	76 8	67 5	66.3
Inequality Coefficients				
Gini	0 468	0 385	0 360	0 348
Theil	0 170	0 106	0 092	0 086

Table 6 shows households cross-classified by both their direct and final quintile incomes The top line, for example, shows the final income ranking of the 20% of households with the lowest direct incomes It can be seen that 63% of these remain in the lowest final income quintile after redistribution, whereas the rest mainly move up one quintile with only a few entering the middle final income quintile The leading diagonal shows the households which remain in the same quintile range after redistribution approximately 54 per cent of households fall into this category.

Table 6: Percentage households in State, 1980 classified by Direct and FINAL QUINTILE INCOME

Direct Quintile Income	*1*	*2*	*3*	*4*	*5*	*State*
	%	%	%	%	%	%
1	12 6	5.2	1.6	0.5	0 1	20.0
2	6.5	7.7	3.6	1 6	0.5	20.0
3	0.8	5.8	8.4	4.2	0.8	20 0
4	0 1	1 1	5 5	9 7	3 5	20 0
5	0 0	0 1	0 8	3.9	15 1	20 0
STATE	20.0	20 0	20.0	20 0	20.0	20 0 (7,185)

Table 7 shows the corresponding average size of households classified by direct and final quintile incomes The households which gain most (least) from the redistribution process tend to be the larger (smaller) households in each direct income quintile This is evident from the fact that in each direct income quintile the ranking of households after redistribution is directly related to household size Size and composition have, as we shall see, a significant bearing on the extent to which households are affected by the redistribution process

Table 7 Average number of persons per household, in State 1980 classified by Direct and Final Quintile Household Income

Direct Quintile Income	Finale Quintile Income					STATE
	1	2	3	4	5	
	No	No	no	No	No	No
1	1 71	2 90	5 03	7 57	11.86*	2 49
2	1 83	2 63	4 05	5 90	8 84	3 05
3	2 33	2 65	3 77	5 47	8 13	3 92
4	2 69	2 86	3 22	4 33	6 33	4 28
5	3 98	3 18	3 26	3 37	5 36	4 87
STATE	1 79	2 72	3 75	4 59	5 75	3 72

* small number of households (see Table 6)

Household Composition

The published CSO reports concentrate mainly on the effect of household composition on the redistribution process. It distinguishes twelve household types and classifies results of each by direct income Table 8, summarises the overall outcome for each of these household types on both a direct and final income basis.

Table 8 shows that the degree of income inequality for households within each composition category was reduced as a result of State tax/benefits transfers. This reduction was very substantial in the case of single and two adult households which are comprised largely of retired persons. There is also a general tendency for the Gini and Theil coefficients to fall on both the direct and final income basis as the number of adults in households increase

The most interesting feature of Table 8 is the information the Theil coefficient decomposition provides on the extent to which differences beween and within household composition groupings contribute to the overall level of income inequality in the community In 1980 approximately 23 per cent of the total direct income inequality was due to household composition income differentials (between-group effect). The remaining 77 per cent was due to inequality between households

of the same composition, i e the within-group contribution, this was largest in the case of one and two adult households. The degree of inequality due to household composition differences was almost unchanged on a final income basis so that nearly the complete effect of the redistribution process through State benefits and taxes was to reduce within group inequality, i e that due to income differentials between households of similar compositions

From the foregoing it is evident that comparison of income distributions and the degree of income inequality for different categories of households or between different periods can be considerably affected by differences in household composition This can be avoided by the use of adult equivalent scales which are intended to convert the incomes of households with different compositions to a common basis for comparison purposes

Table 8 Gini and Theil Direct and Final Household Inequality Coefficients, 1980 classified by Household Composition

Household Composition*	No of Households (adjusted)	Direct Income (household)			Final Income (household		
		Gini Coeff	Theil Coeff	% Contrib	Gini Coeff	Theil Coeff	% Contrib
	No			%			%
1 Adult	1 181	0 636	0 327	12 0	0 314	0 081	6 4
2 Adults	1 451	0 541	0 225	19 4	0 298	0 068	11 7
2 Adults and 1 Child	443	0 308	0 078	3 0	0 253	0 051	3 1
2 Adults and 2 Children	733	0 337	0 093	6 3	0 276	0 061	7 2
2 Adults and 3 Children	532	0 339	0 094	4 6	0 234	0 043	3 9
2 Adults 4 or more children	464	0 376	0 119	4 6	0 212	0 033	2 9
3 Adults	517	0 446	0 148	6 4	0 277	0 058	4 8
3 Adults & Children	505	0 384	0 115	5 2	0 249	0 045	4 5
4 Adults	292	0 337	0 084	3 1	0 235	0 040	2 6
4 Adults & Children	308	0 356	0 097	3 1	0 192	0 028	2 1
Other households without Children	234	0 259	0 060	2 5	0 191	0 031	2 3
Other households with Children	525	0 347	0 100	7 0	0 204	0 034	5 3
Sub totals**							
Within Groups			0 132	77 3		0 049	56 8
Between groups			0 038	22 7		0 037	43 2
TOTAL	7 185	0 468	0 170	100 0	0 348	0 086	100 0

* Children defined as under 14 years

** The within-group and between-group sub-totals are estimated independently of the total Theil inequality coefficient throughout this paper.

Conversion to Adult Equivalent Basis

There is at present no generally accepted methodology for calculating adult equivalent scales In such circumstances, the approach adopted by the U K Royal Commission on the distribution of Income and Wealth (1978) is followed by using the scales implicit in the social welfare benefits For this purpose Roche's (1983) method of deriving equivalent scales from the unemployment assistance (rural) payment rates (which are identical to the supplementary welfare allowances introduced in 1977) is used Averaging these rates over the period 1973-'80 and taking account of children's allowances the following adult equivalent scales are initially derived

Adult (no dependent)	1 00
Married couple	1.74
Child (under 18 years)	0.39
Additional adults	0 74

However, as the data tapes on which these analyses are based distinguished household members aged 0-4 years, 5-13 years and 14-20 years McClements (1978) UK scales were used to derive the following rates

Adult (no dependent)	1.00
Married couple	1.74
Persons 0-4 years	0 25
Persons 5-13 years	0.38
Persons 14-20 years	0 53
Additional adults	0.74

Note· A "child" is defined as being under 14 years in the household composition classifications used in Tables 8 and 11.

These scales were used to convert income redistribution data at individual household level. It must, of course, be emphasised that these scales are only approximations, but they should prove reasonably satisfactory if roughly of the correct order of magnitude.

Table 9: Direct and Final Income Distributions, 1980 on both Household and Adult Equivalent Basis

Item Description	*Direct Income*		*Final Income*	
	Household (Table 5)	*Adult Equivalent*	*Household (Table 5)*	*Adult Equivalent*
% Income Share	%	%	%	%
Bottom quantile	0 5	0 7	5 8	8 8
Second quantile	8 5	9 3	11 9	14 3
Middle quantile	17 1	17 0	17 2	17 5
Fourth quantile	25 8	25 3	24 0	22 3
Top quantile	48 1	47 6	41 2	37 0
Top decile	29 7	29 8	25 1	22 7
STATE	100 0	100 0	100 0	100.0
% of Median Income	%	%	%	%
Bottom quintile	-83 1	-77 6	-45 6	-27 1
Top quintile	85 1	83 2	66 3	47 6
Inequality Coefficients				
Gini	0 468	0 459	0 348	0 272
Theil	0 170	0 163	0 086	0 054

Direct and final decile income classifications of the 1980 income redistribution results on this equivalent adult basis are provided in Appendix I. The effects of this conversion at the overall level are summarised in Table 9 and compared with the household (unadjusted) results already presented in Table 5

The conversion reduces the direct income inequality marginally, but it has a more sizeable effect on the final income basis Some insight into the reasons for this may be gleaned at this stage by examining the cross-classification of households by direct and final income on the equivalent adult basis which is presented in Table 10 There is little or no change in the inter-quintile movement of households on an equivalent adult basis. 52 per cent of the households remain in the same quintile ranking compared with 54 per cent on the adjusted basis There is, however, a large reduction in the range of average household size, this is particularly pronounced on the equivalent adult final income basis which explains to some degree the reduction in equality referred to above Equivalent cross-classifications of household and adult equivalent quintiles are provided in Appendix 2, on both the direct and final income basis as they reveal some interesting features

Table 10: Percentage household distribution and average size, 1980 classified by adult equivalent Direct and Final Income

Adult Equivalent Direct Quintile Income	*Adult Equivalent Final Quintile Income*					
	1	*2*	*3*	*4*	*5*	*STATE*
	Distribution of Households					
	%	%	%	%	%	%
1	10 4	7.1	2.1	0 4	-	20 0
2	6 7	6 8	4 8	1.4	0 3	20 0
3	2 2	4 5	8.6	4 1	0 6	20.0
4	0.5	1 5	4 1	10 6	3 3	20 0
5	0 2	0 1	0.4	3.5	15 8	20 0
STATE	20 0	20 0	20 0	20 0	20 0	100 0
	Average Persons					
	No	No	No	No	No	No
1	3.07	2 58	2.08	2 30	-	2 78
2	3 83	4 82	4.43	3 00	3.01	4 24
3	3 58	4 13	4 57	4.89	3.55	4 40
4	3 76	3 47	3 59	4.30	4 15	4 05
5	1 70	2 37	3 12	3 12	3 14	3 12
STATE	3 39	3 76	4 05	4 08	3 32	3 72

Table 11 summarises the outcome for individual household composition categories on an adult equivalent basis for comparison with the unadjusted results presented in Table 8 The effectiveness of the approximate equivalent adult conversion procedure looks quite satisfactory The inter-household composition group contribution to direct income inequality drops from 23 per cent using unadjusted household data to only 3 per cent on the equivalent adult basis. For final income it is reduced from 43 per cent to negligible proportions The results for single adult households, which should not be affected by the conversion, differ marginally because of the use of different income classifications in the two calculations.

The conversion to an adult basis is used subsequently to eliminate the distorting influences of household composition which are confounded with the effects of other characteristics such as the age, life cycle and livelihood status of the head of household, and the number of earners in households considered to be major factors contributing to the degree of income inequality in the community

Table 11: Gini and Theil Direct and Final Adult Equivalent Inequality Coefficients, 1980 classified by Household Composition

Household Composition°	*Direct Income (adult equivalent)*			*Final Income (adult equivalent)*		
No. of Households (adjusted)		Gini Coeff	Theil Coeff	% Contr	Gini Coeff	Theil Coeff	% Contrib
	No			%			%
1 Adult	1,181	0 629	0 319	28 8	0 331	0 080	24 0
2 Adults	1,451	0 539	0 224	28 5	0 307	0 068	26 1
2 Adults and 1 Child	443	0 305	0 076	3 7	0 255	0 046	5 3
2 Adults and 2 Children	733	0 336	0 092	6 5	0 270	0 054	10 3
2 Adults and 3 Children	532	0 339	0 096	4 3	0 236	0 041	5 2
2 Adults and 4 or more Children	464	0 376	0 116	3 4	0 204	0 030	3 0
3 Adults	517	0 447	0 150	6 8	0 278	0 056	7 5
3 Adults plus Children	505	0 397	0 121	4 4	0 242	0 043	5 2
4 Adults	292	0 338	0 089	2 7	0 237	0 041	3 3
4 Adults plus Children	308	0 377	0 109	2 4	0 208	0 031	2 4
Other households without Children	234	0 301	0 070	1 8	0 235	0 039	2 8
Other households with children	525	0 351	0 098	3 9	0 188	025	3 4
Sub totals							
Within Group	-	-	0 159	97 0	-	0 053	98 5
Between Group	-	-	0 004	3 0	-	0 001	1 5
STATE	7,185	0 459	0 163	100 0	0 272	0 054	100 0

* Children defined as under 14 years

Age of Head of Household (HOH)

Age of the HOH is a factor generally expected to make a significant contribution to the degree of income inequality There are large income differentials between households with young heads at the start of their working lives, middle aged heads advanced in their careers with some children also working, and those of mature years living on retirement pensions The average weekly incomes, benefits and taxes of households classified by the age of HOH in 1980 are shown in Appendix 3

These results reveal a number of largely expected features. Household size increases up to a HOH age of 44 years It drops back for ages 45-64 and then falls substantially due to family dispersal. Income levels follow a rising trend up to 65 years with a very substantial fall-off afterwards due to retirement. Cash transfers rise consistently but non-cash benefits drop off after 65 years Where the HOH is young far more taxes are paid than benefits received. A more balanced situation emerges in the middle age ranges (30-64 years) because of increases in the number of children and the consequential increase in non-cash benefits due to the usage of education and health services in particular.

At this point it is important to point out the qualification which must be attached to classifications based on the head of household. In the HBS there are no explicit rules as to whom should be taken as the HOH. The choice is left to respondent households who are requested to choose the person they consider to be head Allowance must be made for this in comparing HOH classifications for different sub-popualtion and particularly for comparisons over time.

The overall direct and final income inequality outcome is summarised in Table 12 for each HOH age range on both a household and adult equivalent basis. On the household basis the degree of inequality is reduced within each age category; this is particularly substantial in the highest age range comprised predominantly of retired persons. The decomposition of the Theil coefficient shows that 84.5% of the overall direct household income inequality is generated by households with HOHs of roughly similar ages, i.e. within-group contribution, and 15.5 per cent is due to direct income differentials between households with HOHs of different ages, i.e. between -group contribution. Looking at final income it is seen that the redistribution process reduces both within- and between-age group inequally by about the same proportion. When converted to an adult equivalent basis there are only marginal reductions in the degree of direct income inequality, but for final income the fall is relatively sizeable due largely to a reduction in the between-age group contribution.

Table 12 Gini and Theil Direct and Final Income Inequality Coefficients, 1980 classified by Age of Head of Households (HOH)

		Direct Income			*Final Income*		
Age of HOH Households	*No of Coeff (adjusted)*	*Gini Coeff*	*Theil Coeff*	*% Contrib*	*Gini Coeff*	*Theil*	*% Contrib*
		Household Basis					
	No			%			%
Under 30 years	1,002	0 359	0 107	9 6	0 289	0 066	9 5
30 - 44 years	2,147	0 346	0 095	19 5	0 269	0 054	21 1
45 - 64 years	2,407	0 444	0 149	35 3	0 358	0 092	42 4
65 plus years	1,628	0 669	0 363	20 1	0 339	0 086	14 6
Sub-totals							
Within Group	-	-	0 144	84 5	-	0 075	87 5
Between Group	-	-	0 026	15 5	-	0 011	12 5
STATE	7,185	0 468	0 170	100 0	0 348	0 086	100 0
		Adult Equivalent Basis					
	No			%		%	%
Under 30 years	1,002	0 360	0 105	12 7	0 281	0 056	16 0
30 - 44 years	2,147	0 383	0 113	23 4	0 267	0 053	30 3
45 - 64 years	2,407	0 417	0 133	28 9	0 284	0 058	36 7
65 plus years	1,628	0 634	0 321	21 6	0 221	0 039	13 8
Subtotals							
Within Group	-	-	0 141	86 5	-	0 052	96 9
Between group	-	-	0 022	13 5	-	0 002	3 1
STATE	7,185	0 459	0 163	100 0	0 272	0 054	100 0

Table 13: Defintion of Life Cycle Classification of Head of Household (HOH)

Code	Life Cycle Description	HOH Age	HOH Status	HOH's Spouse (Resident)	Age of Children (resident) 1-4	5-9	10-14	15-19	20+	Other Resident Persons
	HOH without resident spouse or children									
1.	Young	Under 45	Married/ Widowed	None			None			No Restriction
2.	Middle aged	45-64	"	"			"			"
3.	Retired	65+	"	"			"			"
22.	Young	Under 45	Single	"			"			"
23.	Middle aged	45-64	"	"			"			"
24.	Retired	64+	"	"			"			"
	HOH with resident spouse but no children									
4.	Pre-family	Yes (0-44 if female)	Married	(0-44 if female)			None			No Restriction
5.	Empty Nest	Yes (45-64 if female)	"	(45-64 if female)			"			"
6.	Retired	Yes (65+ if female)	"	(65+ if female)			"			"
	HOH with resident children									
7.	Pre-school	No Restrictions			All	0	0	0	0	No Restriction
	Early School									
8.	- only	"			0	All	0	0	0	"
9.	- youngest pre-school	"			Some	Some	0	0	0	"
	Pre-adolescent									
10.	- only	"			0	0	All	0	0	"
11.	- youngest pre-school	"			Some	?	Some	0	0	"
12.	- youngest early school	"			0	Some	Some	0	0	"
	Adolescent									
13.	- only	"			0	0	0	All	0	"
14.	- youngest pre-school	"			Some	?	?	Some	0	"
15.	- youngest early school	"			0	Some	?	Some	0	"
16.	- youngest pre-adolescent	"			0	0	Some	Some	0	"
	Adult children									
17.	- only	"			0	0	0	0	All	"
18.	- youngest pre-school	"			Some	?	?	?	Some	"
19.	- youngest early school	"			0	Some	?	?	Some	"
20.	- youngest pre-adolescent	"			0	0	Some	?	Some	"
21.	- youngest adolescent	"			0	0	0	Some	Some	"

(0 = none; Some = 1+; ? = None or some)

Life Cycle of Head of Household (HOH)

The contribution of the HOH's age to income differentials is clearly due to life cycle related factors. Prompted by the paper read to this Society by Rottman. Hannan and Wiley (1981) a life cycle classification has been developed by the CSO and incorporated onto its HBS and income redistribution tapes The detailed classification is specified for reference purposes in Table 13. It was formulated to allow either the youngest or oldest child to be used for defining life cycle categories. This type of classification is reasonably straight forward to devise in the case of individuals or family units. With households problems arise when more than one family unit is involved, e g. HOH with married son or daughter also resident The solution adopted was to base the household life cycle classification on the HOH and his/her immediate family, i e. spouse and children of any age No account was taken of other persons in the household and this feature should always be borne in mind in interpreting the results. Eleven life-cycle categories based on the eldest child are used for analysis purposes in this paper, namely:

HOH without spouse/children

(1) Young (codes 1 + 22)
(2) Middle aged (code 2) + 23)
(3) Retired (codes 3 + 24)

HOH with spouse and/or children

(4) Pre-family (code 4)
(5) Pre-school (code 7)
(6) Early school (codes 8 + 9)
(7) Pre-adolescent (codes 10 to 12)
(8) Adolescent (codes 13 to 16)
(9) Adult (codes 17 to 21)
(10) Empty nest (code 5)
(11) Retired (code 6)

Table 14: Theil Direct and Final Income Inequality Coefficients, 1980 classified by Life Cycle of Head of Household (HOH)

Life Cycle	No of Households	Household Basis: Direct Income Theil Coeff	% Contrib	Final Income Theil Coeff	% Contrib	Adult Equivalent Basis: Direct Income Theil Coeff	% Contrib	Final Income Theil Coeff	% Contrib
	No.			%		%		%	
HOH without spouse/children									
Young	474	0.116	5.0	0.111	7.3	0.082	6.3	0.070	11.9
Middle aged	517	0.259	5.4	0.125	5.2	0.254	10.5	0.109	13.5
Retired	702	0.458	5.0	0.066	3.2	0.440	9.3	0.037	5.6
HOH with spouse and/or children									
Pre-family	246	0.070	1.9	0.052	1.9	0.068	2.6	0.053	4.2
Pre-school	776	0.087	6.0	0.061	6.8	0.087	6.9	0.052	10.0
Early school	917	0.107	8.5	0.046	7.1	0.110	8.3	0.045	9.7
Pre-adolescent	823	0.118	8.6	0.043	6.9	0.123	7.5	0.040	8.0
Adolescent	855	0.103	8.7	0.040	7.7	0.111	7.2	0.037	8.2
Adult	1,184	0.112	16.8	0.062	17.2	0.102	11.4	0.042	13.4
Empty nest	345	0.238	4.6	0.086	3.2	0.236	6.3	0.079	6.1
Retired	345	0.320	2.8	0.032	1.1	0.324	4.0	0.029	2.1
Sub-totals									
Within group	-	0.125	73.4	0.058	67.5	0.131	80.3	0.050	92.5
Between group	-	0.045	26.6	0 028	32.5	0.032	19.7	0.004	7.5
STATE	7,185	0.170	100 0	0.086	100.0	0 163	100.0	0.054	100.0

* children of any age

Average weekly income, taxes and benefits in 1980 are given for each of these categories in Appendix 3 and, in particular, they throw further light on the trends already discussed for the different HOH age ranges The overall direct and final income inequality outcome is summarised in Table 14 for each of these life cycle categories on both a household and adult equivalent basis Because of space limitation only the Theil inequality coefficient is used On the household basis nearly 27 per cent of the overall direct income inequality is due to inter-life cycle income level differentials For final income this rises to 32 per cent indicating that the redistribution process reduces the inequality within life cycle categories relatively more than it affects between-cycle income differentials The conversion to adult basis reduces the inter-cycle contribution quite substantially for direct income and almost completely eliminates it for final income Total within-life cycle contribution changed marginally after conversion, but there are some interesting outcomes for particular life cycle stages

Table 15· Theil Direct and Final Income Inequality Coefficients, 1980 classified by Livelihood Status of Head of Household and Number of Earners in the Household

Household Characteristic	No of Households (adjusted)	Household Basis				Adult Equivalent Basis			
		Direct Income		Final Income		Direct Income		Final Income	
		Theil Coeff	% Contrib	Theil Coeff	% Contrib	Theil Coeff	% Contrib	Theil Coeff	% Contrib
	No		%		%		%		%
Livelihood Status of HOH									
Self employed	1,647	0 167	22 5	0 117	33 3	0 152	19 4	0 089	36 3
Employee	3,387	0 058	22 5	0 052	32 9	0 062	25 0	0 038	37 5
Out of Work	460	0 530	5 2	0 081	4 6	0 480	3 6	0 028	2 1
Retired	983	0 375	11 7	0 077	7 9	0 338	12 7	0 036	7 4
Other	708	0 399	10 1	0 116	8 8	0 345	10 5	0 045	7 2
Sub totals									
Within group		0 123	72 0	0 075	87 6	0 116	71 2	0 049	90 6
Between group		0 047	28 0	0 011	12 4	0 047	28 8	0 005	9 4
No of Earners									
None	1,608	0 522	10 2	0 063	9 0	0 523	17 3	0 039	11 8
One	4 018	0 089	28 7	0 066	40 5	0 100	36 9	0 054	54 8
Two	1,023	0 049	6 8	0 045	10 3	0 067	9 6	0 046	15 8
Three or more	536	0 026	2 7	0 022	3 8	0 042	2 8	0 028	4 7
Sub totals									
Within group		o o82	48 4	0 055	63 6	0 109	66 6	0 047	87 1
Between group		0 088	51 6	0 031	36 4	0 054	33 4	0 007	12 9
STATE	7,185	0 170	100 0	0 086	100 0	0 163	100 0	0 054	100 0

Other Inequality Related Household Characteristics

Two other household features in particular are likely to contribute significantly to the degree of household income inequality in the community, namely livelihood status of the HOH and the number of earners in households. Results for the former are published in the CSO reports and details for the latter are provided in Appendix 3

The direct and final income inquality situation for these two factors are summarised in Table 15, again, in terms only of the Theil coefficient on both the household and adult equivalent basis The figures confirm that between-group contributions of both factors on a household basis account for a considerable proportion of the overall direct income inequality, particularly the number of constituent earners in a household (52 per cent) In each instance the redistribution process reduces both between the within-group final income inequality contributions the former still remains sizeable at 12 per cent (for livelihood status) and as high as 36 per cent (for number of earners) of the final income global inequality However, these are largely due to household composition related income differentials since they are considerably reduced on the adult equivalent basis

Maximum Disaggregation of Inequality

The foregoing analysis has demonstrated that the overall level of direct and final income inequality in the community is due both to income differentials between household of different types (inter-group contribution) and to the inequality existing within the groupings of similar households (intra-group contribution) The various household groupings which have been examined contribute in various proportions to this decomposition The result obtained for any one factor has compounded with it the effects of the others because of inter-correlations The effects of household composition are successfully eliminated by the use of adult equivalent scales In this section results are presented of an attempt made to cross-classify the other factors in order to identify their separate contributions in isolation and to determine the maximum contribution of inter-group income differentials The extent to which this can be done is limited by sample size considerations since each sub-group distinguished must be further classified by income to enable inequality coefficients to be calculated Again because of space limitations, the analysis is restricted to the Theil coefficient.

"Age" and "livelihood status" of the HOH together with the "number of earners" in the household are the three factors which are cross-classified on adult equivalent basis for this purpose Table 16 defines the cross-classification which is used and summarises the outcome for both direct and final income. As can be seen 36.2 per cent of the direct income inequality arises from income differentials between the 11 household categories distinguished After the redistribution this reduces to 15 3 per cent The remaining inequality on both income bases arises from differentials amongst similar households within these groups The largest contributor to this are the single earner households This is not unexpected since these households constitute the largest grouping in the community and embrace income levels from

one extreme to other due to differences in education, training ability, professions, background, etc. The greatest interest in Table 16, however, stems from its use in analysing changes in the levels and sources of income inequality between 1973 and 1980 which are considered in the next part of the paper.

Table 16: Theil Direct and Final Adult Equivalent Inequality Coefficients, 1980 cross-classified by Age and Livelihood Status of Head of Household (HOH) and Number of Earners in Household

Households Characteristics				Direct Income		Final Income	
HOH Age	HOH Status	Earners	No of Households (adjusted)	Theil Coeff	% Contrib	Theil Coeff	% Contrib
Under 45	At work	1	2,335	0 076	17 8	0 050	30 0
	At work	2 +	490	0 037	3 3	0 032	6 2
	Out-of-work	-	240	0 609	1 2	0 027	1 0
	Other	-	85	o 248	0 8	0 040	0 8
45 - 64	At work	1	1,083	0 130	12 5	0 069	18 9
	At work	2 +	778	0 049	4 6	0 036	8 6
	Out-of-work	-	208	0 323	1 7	0 025	0 9
	Other	-	339	0 229	4 9	0 067	5 4
65 plus	At/out-of-work	-	361	0 161	3 8	0 059	4 9
	Other	0	1,023	0 475	11 4	0 029	5 9
	Other	1 +	244	0 093	1 8	0 033	2 1
Sub-totals							
Within group			-	0 104	63 8	0 046	84 7
Between group			-	0 059	36 2	0 008	15 3
STATE			7,185	0 163	100 0	0 054	100 0

General Observations

The results of the 1973 national analysis are shown in Appendix 4 classified by both direct and final household income deciles The most striking point, of course, is the considerable increases in the levels of income, taxes and benefits which occurred over the period 1973-'80. The overall features of these 1973 direct and final decile income distributions are summarised in Table 17 on both a household and adult equivalent basis. All indicators show that as in 1980 there was a reduction in the overall level of income inequality in the community as a result of the tax/benefit redistribution process Again, as was the case for 1980, the conversion to adult equivalent basis reduces the level of direct income inequality marginally, but causes a more sizeable reduction on the final income basis.

Table 17: Direct and Final Household and Adult Equivalent Income Distributions, 1973

Item Description	Household Basis		Adult Equivalent Basis	
	Direct Income	Final Income	Direct Income	Final Income
	%	%	%	%
% Income Share				
Bottom quintile	1.2	4.6	1 7	7 7
Second quintile	9.8	11 0	10 5	13 5
Middle quintile	16 9	17 0	16 9	17 2
Fourth quintile	25 1	24.2	24 5	22 1
Top quintile	47.0	43 1	46 5	39 5
Top decile	29 2	26 8	29 4	25 0
STATE	100.0	100 0	100.0	100.0
% of Median Income	%	%	%	%
Bottom quintile	-70 3	-53 1	-63 2	-32.5
Top quintile	85 6	70 5	76.8	50 9
Inequality Coefficient				
Gini	0 446	0.378	0.434	0.306
Theil	0 153	0 102	0 145	0.069

Direct incomes were more equally distributed in 1973 than in 1980 This is not unexpected in view of the deterioration in economic circumstances since 1973, particularly the very high unemployment levels in 1980 which were almost double those of 1973 In view of this the most noteable outcome is the fact that final incomes were more equally distributed in 1980 than in 1973 It will be interesting to analyse how much of this 1973-80 reversal in direct and final income ranking arose as a result of the effects of income differentials between categories of households and changes in the levels of income inequality amongst similar households

Outcome for Different Types of Households

As in 1980 households composition had a very significant effect on the redistribution process in 1973 Approximately 25 per cent (compared with 23 per cent in 1980) of the overall household level of direct income inequality and 39 per cent (43 per cent in 1980) of final income inequality arose because of differences in average income levels between households of different compositons Conversions to an adult equivalent basis again reduces these contributions very considerably, to as low as 4 per cent for direct and to only 1 per cent for final income

Table 18: Theil Direct and Final Income Inequality Coefficients, 1973 for different Household Types

Household Type	Household Basis					Adult Equivalent Basis			
	No of Households (adjusted)	Direct Income		Final Income		Direct Income		Final Income	
	No	Theil Coeff	% Contrib %	Theil Coeff	% Contrib %	Theil Coeff	% Contrib %	Theil Coeff	% Contrib %
Age of HOH									
Under 30 years	592	0 088	4 9	0 083	5 7	0 084	6 2	0 060	8 5
30 44 years	1 951	0 084	16 2	0 061	17 5	0 097	19 3	0 057	22 5
45 64 years	3 320	0 137	43 1	0 103	48 0	0 125	39 3	0 075	46 1
65 plus years	1 876	0 291	25 7	0 126	19 6	0 258	27 1	0 066	19 0
Within group		0 138	89 9	0 093	90 8	0 133	91 7	0 066	96 3
Between group		0 015	10 1	0 009	9 2	0 012	8 3	0 003	3 7
Life Cycle of HOH									
HOH without spouse/ children									
Young	336	0 118	3 5	0 112	4 1	0 086	4 4	0 069	5 9
Middle-aged	664	0 236	6 6	0 137	5 7	0 215	11 4	0 098	10 9
Retired	704	0 427	5 9	0 103	3 5	0 404	10 8	0 059	5 9
HOH with spouse and/or children									
Pre family	195	0 074	1 6	0 080	1 9	0 069	2 1	0 072	3 5
Pre school	670	0 087	5 6	0 097	7 8	0 081	6 3	0 081	10 8
Early school	760	0 083	6 0	0 056	5 9	0 085	6 0	0 049	7 0
Pre adolescent	787	0 101	7 4	0 053	6 6	0 104	6 5	0 046	6 7
Adolescent	1 146	0 097	10 9	0 054	10 3	0 105	9 8	0 048	10 4
Adult	1,709	0 101	19 6	0 071	19 2	0 092	14 9	0 052	16 7
Empty Nest	468	0 199	6 3	0 160	6 7	0 192	9 0	0 146	12 6
Retired	299	0 380	3 5	0 097	1 9	0 378	5 1	0 094	3 8
Within group		0 118	77 0	0 076	73 6	0 125	86 3	0 066	94 4
Between group		0 035	23 0	0 027	26 4	0 020	13 7	0 004	5 6
Livelihood Status of HOH									
Self employed	2 241	0 150	30 4	0 132	42 5	0 137	28 8	0 105	47 2
Employee	3 280	0 056	20 2	0 053	25 2	0 058	22 0	0 039	26 4
Out of work	380	0 414	4 7	0 104	3 6	0 378	3 4	0 018	1 6
Retired	818	0 293	10 2	0 111	7 4	0 268	10 9	0 063	7 3
Other	1,020	0 350	13 7	0 135	11 0	0 309	14 8	0 058	9 2
Within group		0 121	79 2						
Between group		0 032	20 8	0 091	88 7	0 116	80 0	0 063	91 7
				0 012	11 3	0 029	20 0	0 006	8 3
Number of Earners									
0	1,380	0 539	9 4	0 101	7 2	0 554	17 9	0 064	10 9
1	4 297	0 098	34 7	0 089	46 8	0 101	41 1	0 070	57 7
2	1 311	0 056	8 7	0 054	11 2	0 071	11 5	0 053	15 6
3 plus	750	0 031	4 0	0 031	5 5	0 047	4 2	0 037	5 9
Within group		0 087	56 8	0 073	70 7	0 109	74 7	0 062	90 1
Between group		0 066	43 2	0 030	29 3	0 036	25 1	0 007	9 9
STATE	7 739	0 153	100 0	0 102	100 0	0 145	100 0	0 069	100 0

Table 18 summarises the direct and final income outcome in 1973 for different types of households on both a household and adult equivalent basis By and large the same general pattern already observed for 1980 consistently emerges for each household type. Direct income inequality appears to have been higher in 1980 largely because the inter-group contribution for each of the household types considered was greater in 1980 than 1973 On the basis of the details given in Table 18 it appears fair to suggest that this was due in no small measure to the fact that a higher proportion of households in 1980 fell into those categories with particularly low incomes, ie HOHs out of work and retired and households with no earners.

The lower global level of final income inequlaity in 1980, which materialised despite the reverse ranking for direct income, was due to the fact taht between- and within-group inequality contributions were both reduced to a greater extent in 1980 than 1973. The stronger redistributive impact of the tax/benefit transfers in 1980 is particularly evident in the household categories listed in Table 19 This would also explain to some extent the higher within-group inequality reduction as these are largely the same household categories already mentioned as being more prevalent in 1980

Table 19: Theil Inequality Coefficients for Particular Household Types in 1973 and 1980

Household Types	Final Household Income Theil Inequality Coefficient	
	1973	1980
Age of HOH 65 plus years	0 126	0 086
Life cycle of HOH		
Empty nest	0 160	0 086
Retired (with spouse)	0 097	0 032
Livelihood Status of HOH		
Out-of-work	0 104	0.081
Retired	0 113	0 077
Number of Earners		
None	0.101	0 063

Maximum Disaggregation of Inequality in 1973

The maximum 3-way classification of households on an adult equivalent basis involving the characteristics "age" and "livelihood status" of HOH and the "number of earners" in households is repeated for 1973 in Table 20 The corresponding 1980 results given in Table 16 are also shown to facilitate a direct comparison At this point it may be well to repeat that the purpose of this cross-classification is to segregate the inequality creating effect of income differentials between different types of households in the community in order to distinguish the basic income inequality existing amongst similar households The spurious influence of difference in household composition is eliminated by the conversion to adult equivalents

Table 20: Theil Direct and Final Adult Equivalent Income Inequality Coefficients, 1973 and 1980 cross classified by Age and Livelihood Status of Head of Household and Number of Earners in Household

Household Characteristic			No. of Households (adjusted)		Direct Income (adult equivalent)				Final Income (adult equivalent)			
HOH Age	HOH Status	No. of Earners			Theil Coeff.		% Contrib.		Theil Coeff.		% Contrib.	
			1973	1980	1973	1980	1973 %	1980 %	1973	1980	1973 %	1980 %
Under 45	At work	1	1,926	2,335	0.074	0.076	15.1	17.8	0.060	0.050	22.8	30.0
	At work	2+	424	490	0.054	0.037	3.4	3.3	0.041	0.032	4.3	6.2
	Out-of-work	-	115	240	0.594	0.609	0.8	1.2	0.034	0.027	0.4	1.0
	Other	-	79	85	0.301	0 248	1.1	0.8	0.068	0.040	1.0	0.8
45 - 64	At work	1	1,495	1,083	0,117	0.130	16.8	12.5	0.084	0.069	24.6	18.9
	At work	2+	1,132	778	0 058	0.049	7.9	4.6	0.048	0.036	11.8	8.6
	Out-of-work	-	236	208	0.297	0.323	2.1	1.7	0.040	0.025	1.0	0.9
	Other	-	457	339	0.242	0.229	6.6	4.9	0.074	0 067	5.4	5.4
65 +	At/out-of-work	-	574	361	0.143	0.161	6.7	3.8	0.086	0.059	8.7	4.9
	Other	0	852	1,023	0.499	0.475	11.2	11.4	0.052	0 029	5.6	5.9
	Other	1+	450	244	0.080	0.093	2.9	1.8	0.042	0 033	3.2	2.1
Sub-totals												
Within group			-	-	0.108	0.104	74.5	63 8	0.062	0.046	88.9	84.7
Between group			-	-	0 037	0.059	25.5	36.2	0.007	0.008	11.1	15.3
STATE			7,739	7,185	0.145	0.163	100.0	100.0	0.069	0.054	100 0	100.0

The final line of Table 20 summarises the extent to which direct income on an adult equivalent basis was more equally distributed in 1973 (Theil coefficient of 0 145) than in 1980 (Theil coefficient of 0 163) The group sub-totals confirm that this was almost completely due to the fact that income differentials between the 11 sub-groups distinguished were wider in 1980 than in 1973 This factor on its own

accounted for 25 per cent of total overall direct income inequality in 1973 and 36 per cent in 1980 When this effect is excluded we find that the underlying level of direct inequality which arises amongst similar households (between-group) inequality was practically identical in the two periods. In fact, looking at the different groupings of households distinguished one is struck by the remarkable consistency between both years.

Turning to final income Table 20 confirms that the tax/benefit redistribution processes reduces both between group income differentials and within group inequality levels In both respects the process appears to have had a much greater impact in 1980. This is particularly true for the between group inequality contribtution which, despite being higher than 1973 for direct income, ended up being almost on a par on a final income basis. These were the reasons for the noteworthy overall outcome of final income being more equally distributed in 1980 than 1973 despite the reverse ranking for direct income

Summary

Changes in the levels of income inequality in the community between 1973 and 1980 indicated by these results may be summarised as follows:

(1) The tax/benefit redistribution process considerably reduced the degree of income inequality in the community in both years and this resulted from the narrowing income differentials both within and between different types of households,

(2) direct income inequality increased between 1973 and 1980 at the overall level, but his was due entirely to the widening of direct income differentials between different types of households so that the underlying direct income inequality amongst similar type households remained unchanged;

(3) Final income inequality was lower in 1980 than in 1973 due almost entirely to a narrowing of final income differentials amongst similar type households;

(4) The income creating effect of diferences in income levels between different types of households was higher in 1980 (36 per cent of total) than in 1973 (25 per cent) for direct income, but was almost on a par in both years on a much reduced scale for final income.

It might be provocatively argued that income differentials between different types of households are largely an in-built unavoidable and, far more contentiously, acceptable (in that they arise from differences in life cycle, earning capacity, etc.) element and that the real level of undesirable income inequality in the community could be better assessed by reference to the income differentials existing amongst similar households. This underlying level of inequality was almost unchanged between 1973 and 1980 for direct income and is substantially reduced by tax/benefit transfers in both years culminating in final income inequalities which were lower in 1980 than for 1973.

For convenience, the within/between group decompositions of direct and final income Theil coefficients for 1973 and 1980 are summarised in Table 21 for all the household characteristics which have been distinguished

Table 21. Summary of Theil Direct and Final Income Inequality Coefficients; 1973 and 1980

Household Characteristic	Direct Income						Final Income					
	1980			1973			1980			1973		
	Within Group	Between Group	Total	Within Group	Between Group	Total	Within Group	Between Group	Total	Within Group	Between Group	Total
Household Basis												
Household Composition	0 132	0 038	0 170	0 114	0 039	0 153	0 049	0 037	0 086	0 063	0 040	0 102
Lifecycle of HOH	0 125	0 045	0 170	0 118	0 035	0 153	0 058	0 028	0 086	0 076	0 027	0 102
Age of HOH	0 144	0 026	0 170	0 138	0 015	0 153	0 075	0 011	0 086	0 093	0 009	0 102
Livelihood Status of HOH	0 123	0 047	0 170	0 121	0 032	0 153	0 075	0 011	0 086	0 091	0 012	0 102
Number of earners	0 082	0 088	0 170	0 087	0 066	0 153	0 055	0 031	0 086	0 073	0 030	0 102
Adult Equivalent Basis												
Household composition	0 159	0 004	0 163	0 140	0 006	0 145	0 053	0 001	0 054	0 068	0 001	0 069
Lifecycle of HOH	0 131	0 032	0 163	0 125	0 020	0 145	0 050	0 004	0 054	0 066	0 004	0 069
Age of HOH	0 141	0 022	0 163	0 133	0 012	0 145	0 052	0 002	0 054	0 066	0 003	0 069
Livelihood Status of HOH	0 116	0 047	0 163	0 116	0 029	0 145	0 049	0 005	0 054	0 063	0 006	0 069
Number of earners	0 109	0 054	0 163	0 109	0 036	0 145	0 047	0 007	0 054	0 062	0 007	0 069
Age X Livelihood Status X Earners (Table 20)	0 104	0 059	0 163	0 108	0 037	0 145	0 046	0 008	0 054	0 062	0 007	0 069

1973-80 URBAN INCOME REDISTRIBUTION ANALYSES

General Remarks

The main purpose of this section of the paper is to present with minimum analysis and comment previously unpublished details of income distribution analyses completed on an experimental basis for years 1974-79 based on the results of the continuous small-scale annual urban HBS conducted by the CSO during that period These analyses relate to households located in towns with 1,000 or more inhabitants Equivalent results for 1973 and 1980 are also included to give a full continuous eight year span of urban results. As mentioned at the outset the usefulness of the 1974-79 urban analyses is limited because of their small sample coverage

The relevant weekly urban household income, taxes and benefits details classified by direct income deciles are given in Appendix 5 for each year from 1973 and 1980

Summary Analysis of Urban Trends, 1973 - 80

Table 22 summarises the direct and final income urban distributions in each of the years 1973 to 1980 Both distributions are very stable over the period

The overall level of direct income inequality of urban households appears not to have changed much during 1973 and 1974 It increased relatively sharply in 1975, dipped marginally during 1977-78 before rising again in 1979-80 to a level higher than 1973.

Final income inequality followed a somewhat different pattern. It appeared to fall temporarily in 1974 and increase again in 1975. The level dropped relatively evenly and consistently up to 1978 At that point it reverted to an increasing trend to reach a level in 1980 lower than that of 1973

These urban income inequality patterns appear to consistently bridge the situation between 1973 and 1980. However, such summary overall details tell us little about the constituent inter- and intra-group changes for different categories of households which the earlier 1973 and 1980 detailed analyses have shown to be of major importance Unfortunately, because of sample size limitations it is not feasible to segregate these household group effects as was possible for the 1973 and 1980 largescale analyses

Table 22· Direct and Final Income Distributions for Urban° Households, 1973-80

Item Description	1973		1974		1975		1976		1977		1978		1979		1980	
	Direct Income	Final Income	Direct Income	Final Income	Direct Income	Final Income	Direct Income	Final Income	Direct Income	Final Income	Direct Income	Final Income	Direct Income	Final Income	Direct Income	Final Income
% Income Share	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Bottom quintile	2.0	5.4	1.7	6.2	0.8	6.0	0.7	6.3	1.0	6.5	0.8	7.0	0.6	6.8	0.8	6.6
Second quintile	12.1	12.3	11.8	12.5	10.6	12.5	10.8	12.2	11.1	12.6	11.1	12.9	11.1	12.7	10.8	12.4
Middle quintile	17.7	17.9	17.9	17.8	17.8	17.7	17.3	17.7	17.3	17.6	18.0	17.9	17.6	17.6	17.6	17.4
Fourth quintile	24.7	24.3	24.7	24.0	25.3	23.9	25.6	24.2	25.7	24.6	26.0	24.2	25.5	24.1	25.4	23.7
Top quintile	43.5	40.0	43.8	39.5	45.5	39.8	45.6	39.5	45.0	38.7	44.2	38.1	45.2	38.7	45.4	39.9
Top decile	26.6	24.3	26.6	23.3	28.0	23.8	27.7	23.4	27.2	22.8	26.3	22.4	27.4	22.6	27.8	24.3
STATE	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
% of Median Income																
Bottom quintile	-55.7	-51.2	-60.5	-50.0	-73.6	-47.2	-74.0	-45.8	-67.7	-43.8	-72.7	-42.9	-73.3	-42.3	-73.1	-43.0
Top quintile	+69.5	+58.5	+67.3	+59.8	+74.2	+61.1	+83.9	+61.0	+86.1	+65.5	+78.8	+60.9	+81.0	+65.2	+77.6	+62.6
Inequality Coefficients																
Gini	0.400	0.340	0.404	0.327	0.433	0.330	0.436	0.327	0.428	0.320	0.423	0.306	0.430	0.314	0.432	0.327
Theil	0.126	0.083	0.129	0.075	0.148	0.077	0.149	0.075	0.143	0.071	0.142	0.065	0.147	0.068	0.147	0.075

* Towns with 1,000 or more inhabitants

PROGRESSIVITY OF TAX/BENEFIT TRANSFERS

Terminology

The redistributive impact of tax/benefit transfers depends in large measure on their progressivity or regressivity as income rises. To avoid confusion in discussing both taxes and benefits in this regard these terms will be used strictly in their technical senses, i e the term progressive where taxes paid or benefits received as proportion of income rises as income rises, and regressive where the proportion falls Taxes and benefits which constitute a constant proportion of income are said to be proportional (or neutral) In equity terms, of course, a benefit is referred to as progressive if it forms a larger proportion of low than of high incomes. However, the use of this terminology here would be awkward and confusing since it would have different technical meanings depending on whether taxes or benefits were being considered

Measurement of Progressivity and Regressivity

Three different approaches are used to measure the progressivity/regressivity of individual taxes and benefits, namely:

(a) Regression Estimates of Tax/Benefit Elasticities· this is the traditional approach in which a functional relationship between taxes/benefits and income is estimated using regression and elasticities calculated In this paper the double-log linear relationship was applied in all instances.

$$\log_{10} x_d = A + B \log_{10} Y_d$$

where:

(i) dependent variable X represents taxes or benefits;
(ii) independent variable Y represents disposable income/ total expenditure quantiles;
(iii) sub-script "d" denotes that grouped data is used classifed by disposable income;

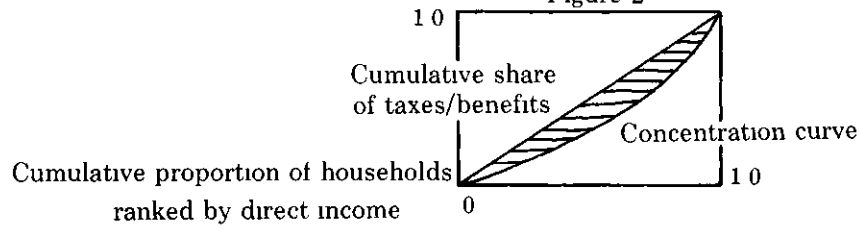
In this particular formulation the regression coefficient B represents the elasticity of the relevant tax or benefit taken as the dependant variable, i.e. the proportional change in tax/benefit for any given change in disposable income (or total expenditure) In the technical sense which has been adopted a particular tax or benefit is, therefore, progressive, regressive or proportional depending on whether its elasticity is greater than, less than or equal to unity, respectively.

Total expenditure is taken in addition to disposable income as a basis, i.e independent variable, for assessing progressivitiy in recognition of the proponents of Milton Friedman's permanent income hypothesis who consider it to be a better approximation to lifetime or permanent income. In this situation the consistent estimation of the regression coefficient is assured by using grouped data classified by disposable income, see Liviatan (1961)

(b) Kakwani's Progressivity Coefficient Kakwani (1977) proposed the coefficient $P = C - G$

where C = Concentration index for a tax of benefit calculated exactly as in the case of the Gini Coefficient except that the cumulative proportion of tax paid (or benefit received) is plotted vertically (instead of income share) against the cumulative proportion of households in increasing order of direct income along the horizontal axis, i e C = shaded area ÷ under diagonal in Figure 2

Figure 2



G = Gini coefficient for direct income (concentration index for direct income as a measure of progressivity where a positive value indicates a progressive system and a negative value implies a regressive one

The main attractions of this measure are

(i) its close relationship to the Gini coefficient,
(ii) the possibility of combining individual taxes and benefits coefficients in proportion to their corresponding average tax (negative) and benefit rates,
(iii) its use for decomposing the change in equality shown by the Gini coefficients for direct (G) and final (G*) incomes in terms of the contribution of each tax and benefit

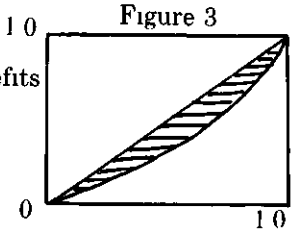
$$G^* - G = \frac{\xi P_b.b - \xi P_c.t}{1 + b - t}$$

where P_b and P_t are the Kakwani benefit and tax progressivity coefficients, and b and t the corresponding benefit and tax rates

As regards (iii) it should be noted that G* in this formulation is the hybrid final income Gini coefficient, i e the coefficient for the final income calculated on the basis of households ranked by direct income This limitation does not appear to be mentioned in the literature

(c) Suits Progressivity Index this progressivity measure proposed by Suits (1977) is also closely related to the Gini coefficient It is calculated by plotting the cumulative proportion of total taxes paid (or benefits received) vertically against the cumulative proportion of total income along the vertical axis

Figure 3



Cumulative proportion of total income

S - Shaded area / Area under diagonal - 1 - Area under curve / Area under diagonal

ranges in value between -1 (extreme regressivity) through 0 (proportional) to+1 (extreme progressivity)

Like Kakwani's coefficient the Suits progressivity indices for individual taxes (S_t) and benefits (S_b) may also be combined in proportion to their average rates

The attractiveness of the Suits is enhanced by a simple extension that also allows it to be used to decompose the change in inequality effected by tax/benefit transfers in terms of their separate contributions This is simply achieved by calculating the Suits index (S_f) for final income (final income shares plotted against direct income shares) which provides a direct measure of the change in inequality, e g. a negative value indicating inequality reduced (final income share greater than direct income share) and vice versa. Since the Suits index for direct income is clearly zero it readily emerges that

$$S_f = \frac{S_b.b - S_t.t}{1+b-t} = \frac{S_b.\bar{b} - S_t.\bar{t}}{\bar{d}+\bar{b}-\bar{t}\ (\bar{f})}$$

Where $\bar{d}$, $\bar{b}$, $\bar{t}$ and $\bar{f}$ represent average direct income, benefit receipts, tax payments and final income, respectively, (i.e. $b=\frac{\bar{b}}{\bar{d}}$ $t=\frac{\bar{t}}{\bar{d}}$).

The double-log regression approach has been used by Adams (1980) for analysing the progressivity of VAT in Ireland and a number of other countries, whilst Nolan (1981) has applied Suit's progressivity index on a gross income basis to the direct and indirect tax results of the 1973 income redistribution analysis. All three approaches are applied here to taxes and benefits results of both 1973 and 1980 analysis converted to adult equivalent bases to eliminate the spurious effects of household composition variations.

The basis with respect to which progressivity is measured clearly influences the results. Direct income would probably be an acceptable assessment basis for direct taxes and cash benefits, whereas disposable income would be generally acceptable for indirect taxes and non-cash benefits. As mentioned earlier, total expenditure, i.e. consumption, is advocated by the permanent income proponents. However, the main interest here is the joint assessment of taxes and benefit. This requires the same basis to be used for all taxes and benefits. The approach actually adopted is to use the direct income basis for the main Kakwani and Suits assessment of the progressivity of taxes and benefits and their contribution to inequality change

(Table 23), and to repeat them on the disposable income basis (Table 24) for comparison with the regression elasticity estimates

Presentation of Results

The Kakwani and Suits progressivity coefficients shown in Table 23 (on the direct income basis) for both 1973 and 1980 show very close consistency Income tax is seen to be the only progressive tax in both periods. All indirect taxes are shown to be regressive Social insurance was only mildly regressive in 1980. Taxes taken as a whole turn out to be regressive, but it is interesting to note that the level appears to have fallen substantially between 1973 and 1980 despite the fact that this change is not evident for either direct or indirect taxes separately. The reason, however, for the drop in their combined regressivity was that the direct tax proportion rose from approximately 35 per cent in 1973 to over 50 per cent in 1980 On the benefits side the proportion of both cash and non-cash benefits received falls substantially as direct income rises and so are markedly progressive in the equity sense

Table 23 also gives an interesting insight into the relative contributions of individual taxes and benefits to the redistrubtion process in 1973 and 1980. The Kakwani and Suits decomposition formulae give equivalent results. The reduction in inequality in both years is predominantly attributed to State benefits, particularly social welfare pensions, medical services and education Consistent with the earlier analyses the inequality reduction was greater in 1980, shown here to be due to the lower overall regressivity of taxes referred to above In interpreting these results, however, allowance must be made for the hybrid assessment of the final income inequality level. One outcome of this analysis is that the kakwani and Suits progressivity measures give essentially the same results With inequality change decomposition now possible on both bases there is little to chose between them.

Table 23: Progressivity of taxes and benefits and their contribution to the total income inequality reduction, 1973 and 1980 assessed on direct income basis.

Item Description	1973 (adult equivalent)				1980(adult equivalent)			
	Kakwani		Suits		Kakwani		Suits	
	Coeff.	% Contrib.	Coeff.	% Contrib.	Coeff.	% Contrib.	Coeff.	% Contrib.
		%		%		%		%
Cash benefits								
Children's allowances	-0.464	+ 4.1	-0.510	+ 5.0	-0.467	+ 2.6	-0.517	+ 3.0
Social welfare pensions	-0.512	+ 41.4	-0.791	+ 39.1	-0.978	+ 36.8	-0.849	+ 33.8
Unemployment benefit, & assistance	-0.967	+ 11.7	-0.854	+ 11.3	-1.042	+ 10.6	-0.905	+ 9.8
Other	-0.977	+ 15.5	-0.848	+ 14.7	-0.940	+ 11.4	-0.818	+ 10.5
Total	-0.884	+ 72.7	-0.781	+ 70.0	-0.938	+ 61.4	-0.824	+ 57.1
Direct taxes								
Income tax	+0.171	+ 9.7	+0.208	+ 12.9	+0.139	+ 9.4	+0.188	+ 13.5
Social insurance	-0.154	- 2.0	-0.220	- 3.2	-0.002	- 0.0	-0.021	- 0.2
Total	+0.110	+ 7.7	+0.127	+ 9.7	+0.120	+ 9.4	+0.159	+ 13.3
Non cash benefits								
Medical services	-0.576	+ 18.0	-0.559	+ 19.1	-0.657	+ 23.0	-0.620	+ 23.0
Education	-0.463	+ 18.3	-0.504	+ 21.6	-0.479	+ 12.8	-0.529	+ 14.9
Housing	-0.667	+ 4.6	-0.649	+ 4.9	-0.921	+ 4.2	-0.815	+ 3.9
Other	-0.734	+ 6.9	-0.614	+ 6.3	-0.480	+ 5.4	-0.439	+ 5.3
Total	-0.549	+ 47.8	-0.547	+ 51.9	-0.585	+ 45.4	-0.574	+ 47.1
Indirect taxes								
Rates & water charges	-0.217	- 4.1	-0.200	- 4.1	-0.394	- 0.1	-0.384	- 0.1
Motor taxation	-0.111	- 0.5	-0.126	- 0.6	-0.171	- 0.1	-0.177	- 0.1
VAT	-0.208	- 7.9	-0.214	- 8.8	-0.178	- 4.9	-0.179	- 5.3
Fiscal duty	-0.224	- 15.2	-0.235	- 17.3	-0.237	- 10.4	-0.243	- 11.3
Other	-0.281	- 0.7	-0.291	- 0.8	-0.278	- 0.6	-0.302	- 0.7
Total	-0.216	- 28.3	-0.221	- 31.5	-0.217	- 16.1	-0.221	- 17.4
Total benefits	-0.712	+120.6	-0.661	+121.9	-0.747	+106.7	-0.688	+104.2
Total taxes	-0.102	- 20.6	-0.100	- 21.9	-0.044	- 6.7	-0.026	- 4.2
Total inequality reduction*	-0.169	+100.0	-0.155	+100.0	-0.227	+100.0	-0.215	+100.0

Progressivity in the equity sense indicated by positive coefficients for taxes and negative coefficients for benefits

* *Assessed on hybrid final income basis i e classified by direct income*

Table 24 demonstrates that the regression and Kakwani/Suits approaches provide almost equivalent progressivity/regressivity rankings of individual taxes and benefits on the common disposable income basis The level of such measurements is, however, dependent on the assessment basis used The regression elasticities comply with the normal rule that taxes are more progressive (or less regressive) using total expenditure rather than the disposable income basis The opposite is the case for benefits, they are more regressive technically, i e more progressive in the equity sense, on the expenditure basis The Kakwani/Suits coefficients in Tables 22 and 23 indicate that both taxes and benefits are less regressive, i e more progressive, when measured with respect to disposable income rather than direct income

Table 24: Progressivity° of taxes and benefits, 1973 and 1980 assessed on adult equivalent and disposable income basis

Item Description	1973 (adult equivalent)				1980 (adult equivalent)			
	Total Exp.	Disposable Income			Total Exp.	Disposable Income		
	Regression Elasticity	Regression Elasticity	Kakwani Coefficient	Suits Coefficient	Regression Elasticity	Regression Elasticity	Kakwani Coefficient	Suits Coefficient
Cash benefits								
Children's Allowances	-0.285***	-0.162***	-0.366	-0.388	-0.416**	-0.257**	-0.384	-0.397
Social welfare pensions	-1.513	-0.727	-0.608	-0.568	-1.460	-0.602***	-0.591	-0.572
Unemployment benefits assistance	-1.295**	-0.686***	-0.723	-0.658	-2.193	-1.362	-0.748	-0.679
Other	-2.223	-1.201	-0.654	-0.619	-1.339	-0.636**	-0.596	-0.563
Total	-1.620	-0.858	-0.608	-0.572	-1.487	-0.749	-0.599	-0.572
Direct Taxes								
Income tax	+4.083	+2.242	+0.227	+0.229	+3.393	+1.893	+0.225	+0.238
Social insurance	+1.735	+0.996	-0.096	-0.146	+2.513	+1.587	+0.083	+0.061
Total	+3.470	+1.937	+0.166	+0.158	+3.231	+1.832	+0.205	+0.213
Non Cash benefits								
Medical services	-0.671	-0.364	-0.439	-0.431	-0.707	-0.379	-0.464	-0.449
Education	-0.268***	-0.163***	-0.365	-0.382	-0.442**	-0.289*	-0.394	-0.403
Housing	-1.775**	-0.987***	-0.562	-0.549	-2.698	-1.538	-0.744	-0.694
Other	-0.908**	-0.493***	-0.580	-0.507	+0.056***	+0.089***	-0.296	-0.284
Total	-0.640	-0.346	-0.431	-0.427	-0.569	-0.315	-0.432	-0.424
Indirect taxes								
Rates & water charges	+0.994	+0.576	-0.112	-0.110	+0.485**	+0.254**	-0.213	-0.205
Motor taxation	+1.689	+0.905	-0.028	-0.037	+1.322	+0.710	-0.047	-0.046
VAT	+1.119	+0.616	-0.104	-0.111	+1.270	+0.700	-0.049	-0.052
Fiscal duty	+1.058	+0.594	-0.117	-0.128	+1.027	+0.568	-0.098	-0.103
Other	+0.758	+0.427	-0.174	-0.182	+0.793	+0.435	-0.153	-0.164
Total	+1.075	+0.602	-0.110	-0.118	+1.109	+0.613	-0.081	-0.086
Total benefits	-1.098	-0.580	-0.517	-0.497	-0.961	-0.497	-0.508	-0.492
Total Taxes	+1.616	+0.908	-0.014	-0.022	+1.876	1.063	+0.066	+0.068

* Regression elasticity > 1 and Kakwani/Suits coefficients > 0 indicate (in the equity sense) progressive taxes and regressive benefits

**R 2 < 0 50

*** No correlation at 1% significance level

APPENDIX 1

Average weekly adult equivalent income, taxes and benefits of all households in State, 1980 classified by Direct and Final Adult Equivalent Incomes

Deciles (adult equivalent)		Households (adjusted)	Persons	Direct Income	Cash Benefits	Gross Income	Direct Taxes	Disposable Income	Non-Cash Benefits	Indirect Taxes	Final Income	Direct ÷ Final Income
Code	£ Limit	No.	No.	£	£	£	£	£	£	£	£	
Direct Income (adult equiv.)												
1.	0.000	719	2.599	.000	20.368	20.368	0.411	19.957	10.957	3.483	27.431	0.00
2.	8.976	718	2.959	3.365	16.760	20.125	0.114	20.011	9.655	4.146	25.520	0.13
3.	22.379	719	3.940	16.128	10.492	26.620	0.735	25.885	10.076	5.061	30.902	0.52
4.	31.928	719	4.548	27.385	5.246	32.631	2.237	30.394	9.360	5.872	33.882	0.81
5.	40.005	718	4.490	35.862	3.756	39.617	4.151	35.466	8.385	6.679	37.172	0.96
6.	48.500	718	4.313	44.178	3.476	47.653	5.960	41.694	7.517	7.533	41.677	1.06
7.	58.645	719	4.152	53.287	2.763	56.050	8.207	47.843	6.835	8.605	46.073	1.16
8.	73.280	719	3.957	65.426	2.398	67.824	11 426	56.399	6.727	9.787	53.339	1.23
9.	98.128	718	3.514	83.930	1.853	85.783	16.633	69.150	6.084	11.474	63.759	1.32
10.		719	2.731	139.523	1.033	140.556	32.137	108.419	5.203	15.068	98.553	1.42
Final Income (adult equiv)												
1.	23.637	719	3.192	13.240	6.893	20.133	2.258	17.875	6.468	10.715	13.628	0.97
2.	29.160	718	3,590	15.288	10.773	26.061	1.676	24.385	8.466	6.199	26.652	0.57
3	32.662	718	3.645	18.919	10.900	29.818	2.398	27.420	8.965	5.355	31.030	0.61
4.	36.323	719	3.875	24.186	10.015	34.201	3.119	31.082	9.233	5.802	34.513	0.70
5.	40.012	719	4.028	31.814	7.644	39.458	4.236	35.222	9.097	6.230	38.088	0.83
6.	44.748	718	4.067	40.639	6.227	46.866	6.218	40.648	8.400	6.742	42.306	0.96
7.	50.772	719	4.275	51.511	4.815	56.326	9.105	47.221	8.184	7.721	47.684	1.08
8.	59.069	718	3.888	62.352	4.474	66.826	11.328	55.498	7.846	8.613	54.730	1.14
9.	74.066	719	3.619	79.947	3.771	83.718	16.031	67.687	7.263	9.192	65.758	1.22
10.		719	3.024	131.179	2.642	133.821	25.643	108.177	6.882	11.138	103.921	1.26
STATE		7,185	3.720	46.908	6.815	53.724	8.201	45.522	8.080	7.771	45.832	1.02

Note The corresponding household decile income classifications are given in Table 4

APPENDIX 2

Percentage household distribution and average size, 1980 classified by Household and Adult Equivalent Decile Incomes

Direct Quintile Income (adult equivalent)	Direct Quintile Income (household basis)					
	1	2	3	4	5	STATE
	Distribution of Households					
Quintile	%	%	%	%	%	%
1	18 9	1 1	-	-	-	20 0
2	1 1	13 2	4 8	0 8	0 1	20 0
3	-	3 8	9 2	5 8	1 2	20 0
4	-	1 7	3 6	8 9	5 8	20 0
4	-	1 7	3 6	8 9	5 8	20 0
5	-	0 2	2 4	4 5	12 9	20 0
STATE	20 0	20 0	20 0	20 0	20 0	100 0
	Average Persons					
Quintile	No	No	No	No	No	No
1	2 56	6 65	-	-	-	2 78
2	1 18	3 38	6 44	8 72	13 39	4 24
3	-	1 84	3 90	5 87	9 06	4 40
4	-	1 16	2 42	3 97	6 04	4 05
5	-	1 13	1 11	2 03	3 91	3 12
STATE	2 49	3 05	3 92	4 28	4 87	3 72
Final Quintile Income (adult equivalent)	Final Quintile Income (household basis)					
	Distribution of Households					
Quintile	%	%	%	%	%	%
1	12 4	4 9	2 0	0 6	0 1	20 0
2	3 9	7 3	5 2	2 9	0 8	20 0
3	2 7	4 0	6 0	5 0	2 3	20 0
4	1 0	1 7	4 8	6 6	5 9	20 0
5	-	2 1	2 0	4 9	10 9	20 0
STATE	20 0	20 0	20 0	20 0	20 0	100 0
	Average Persons					
Quintile	No	No	No	No	No	No
1	2 24	4 39	6 22	8 40	11 95	3 39
2	1 05	2 69	4 75	6 82	9 30	3 76
3	1 04	2 19	3 84	5 46	8 25	4 05
4	1 04	1 33	2 49	4 18	6 56	4 08
5	-	1 12	1 53	2 41	4 50	3 32
STATE	1 79	2 72	3 75	4 59	5 75	3 72

APPENDIX 3

Average weekly household income, taxes and benefits of all households in the State, 1980 classified by Age and Life Cycle of Head of Household (HOH) and Number of Earners in Household

Household Classification	Households (adjusted)	Persons	Direct Income	Cash Benefits	Gross Income	Direct Taxes	Disposable Income	Non-Cash Benefits	Indirect Taxes	Final Income	Direct Final Income
	No	No	£	£	£	£	£	£	£	£	
Age of HOH											
Under 30 years	1,002	3 141	120 896	7 277	128 173	22 619	105 554	11 414	20 214	96 753	1 25
30 - 44 years	2,147	4 720	129 952	10 279	140 231	21 931	118 300	23 613	20 017	121 896	1 07
45 - 64 years	2,407	4 125	134 177	13 700	147 877	23 186	124 692	25 437	21 250	128 880	1 04
65 plus years	1,628	2 159	46 254	24 646	70 899	6 491	64 408	16 223	10 528	70 103	0 66
Life Cycle of HOH											
HOH without spouse or children											
Young	474	1 720	124 974	5 497	130 471	27 686	102 785	8 819	18 068	93 535	1 34
Middle aged	517	1 402	54 896	10 667	65 563	8 610	56 952	7 312	9 714	54 549	1 01
Retired	702	1 303	21 214	20 392	41 606	1 939	39 667	12 441	4 927	47 181	0 45
HOH with spouse and/or children											
Pre-family	246	2 124	150 481	4 522	155 003	33 471	121 553	5 440	24 585	102 388	1 47
Pre-school	776	3 744	121 291	6 600	127 891	20 387	107 504	8 844	19 549	96 799	1 25
Early school	917	4 846	118 315	10 901	129 216	18 022	111 194	21 904	19 378	113 719	1 04
Pre adolescent	823	5 549	120 575	13 820	134 395	18 310	116 085	33 816	18 314	131 587	0 92
Adolescent	855	5 695	134 045	15 525	149 571	20 710	128 860	42 592	19 823	151 630	0 88
Adult	1 184	4,674	172 186	20 853	193 040	31 889	161 150	26 105	29 583	157 672	1 09
Empty nest	345	2,102	76 985	14 020	91 005	13 694	77 311	10 617	14 805	73 123	1 05
Retired	345	2 047	34 899	27 862	62 761	3 939	58 822	17 383	9 662	66 543	0 52
Earners in the household											
0	1,608	2 281	16 704	28 860	45 564	1 163	44 401	18 211	7 331	55 281	0 30
1	4,018	3 880	109 825	9 662	119 486	17 372	102 115	20 234	17 613	104 736	1 05
2	1,023	4 040	185 383	10 686	196 070	37 193	158 877	21 536	27 362	153 051	1 21
3 plus	536	6 233	262 724	11 766	274 491	49 329	225 161	32 060	39 180	218 041	1 21
STATE	7,185	3 720	111 138	14 262	125 400	18 948	106 451	20 848	18 307	108 992	10 2

APPENDIX 4

Average weekly income, taxes and benefits of all households in State, 1973 classified by Direct and Final Income Deciles

Deciles (household income)		Households (adjusted)	Persons	Direct Income	Cash Benefits	Gross Income	Direct Taxes	Disposable Income	Non-Cash Benefits	Indirect Taxes	Final Income	Direct ÷ Final Income
Code	£ Limit	No.	No.	£	£	£	£	£	£	£	£	
Direct Income (household)												
1.		774	2.361	0.031	9.635	9.666	-0.002	9.669	4.555	2.554	11.669	0.00
2.	0.46	775	2.180	4.254	6.835	11.089	0.106	10.984	3.314	3.158	11.139	0.38
3.	8.91	774	3.086	13.617	5.685	19.302	0.754	18.548	4.493	4.672	18.369	0.74
4.	18.34	773	3.695	21.830	3.744	25.575	1.794	23.780	5.211	5.524	23.467	0.93
5.	25.00	775	4.111	27.525	3.211	30.736	2.484	28.252	5.700	6.710	27.242	1.01
6.	30.00	773	4.495	33.309	2.884	36.193	3.272	32.921	6.434	8.054	31.301	1.06
7.	36.70	774	4.748	40.566	2.937	43.503	4.211	39.292	6.517	8.489	37.320	1.09
8.	44.79	774	4.690	49.770	2.581	52.352	5.702	46.650	6.506	9.809	43.346	1.15
9.	55.67	773	5.227	63.832	2.714	66.546	8.292	58.254	7.011	11.189	54.076	1.18
10.	73.74	774	5.492	105.267	1.977	107.244	12.825	94.419	7.162	14.368	87.213	1.21
Final Income (household)												
1.		774	1.585	4.905	3.771	8.676	.502	8.174	1.741	5.041	4.874	1.01
2.	8.80	774	1.905	7.124	5.679	12.803	.654	12.149	2.743	3.766	11.126	0.64
3.	13.71	774	2.546	16.284	4.398	20.682	1.754	18.928	2.945	5.508	16.365	0.99
4.	19.14	774	3.198	22.905	4.314	27.219	2.541	24.678	3.675	6.622	21.731	1.05
5.	24.26	774	3.718	28.219	4.032	32.252	3.113	29.139	4.378	6.895	26.623	1.06
6.	29.26	773	4.427	33.736	3.886	37.622	3.906	33.716	5.870	7.540	32.046	1.05
7.	34.88	774	4.919	40.142	3.879	44.022	4.702	39.320	7.062	8.414	37.968	1.06
8.	41.39	774	5.351	47.596	4.109	51.705	5.631	46.073	8.149	8.627	45.596	1.04
9.	49.89	774	5.847	60.694	4.010	64.704	7.443	57.260	9.044	10.001	56.303	1.08
10.	64.69	774	6.588	98.386	4.125	102.511	9.192	93.319	11.292	12.112	92.499	1.06
STATE		7,739	4.008	36.000	4.220	40.220	3.944	36.277	5.690	7.453	34.514	1.04

APPENDIX 5

Average weekly income, taxes and benefits of urban households, 1973 and 1974 classified by direct decile income*

Direct Income Deciles		Households (adjusted)	Persons	Direct Income	Cash Benefits	Gross Income	Direct Taxes	Disposable Income	Non-Cash Benefits	Indirect Taxes	Final Income	Direct ÷ Final Income
Code	£ Limit	No.	No.	£	£	£	£	£	£	£	£	
1973 Urban												
1.	0.34	401	2.491	0.006	10.132	10.139	-0.005	10.144	5.023	2.586	12.579	0.00
2.	15.50	401	2.256	7.810	6.576	14.386	0.562	13.823	4.317	3.957	14.183	0.55
3.	25.00	401	3.310	21.015	3.290	24.305	2.454	21.851	4.923	5.562	21.212	0.99
4.	29.64	401	4.213	27.322	2.993	30.315	2.903	27.412	6.479	6.954	26.937	1.01
5.	35.00	402	4.368	32.178	2.486	34.664	3.822	30.842	6.501	7.654	29.689	1.08
6.	41.35	401	4.486	38.256	2.492	40.748	4.584	36.163	6.202	8.878	33.487	1.14
7.	48.31	401	4.631	44.931	2.286	47.218	6.040	41.178	6.670	9.352	38.496	1.17
8.	59.33	401	4.564	53.619	2.134	55.754	7.662	48.092	6.400	10.430	44.062	1.22
9.	76.92	401	5.071	67.492	2.160	69.652	11.116	58.534	6.831	12.333	53.033	1.27
10.		401	5.356	106.054	1.788	107.843	17.131	90.712	7.200	16.240	81.672	1.30
	Total	4,011	4.075	39.865	3.634	43.499	5.626	37.872	6.055	8.394	35.533	1.12
1974 Urban (9 months)												
1.	0.57	140	2.116	0.020	12.502	12.522	-	12.522	5.271	2.437	15.356	0.00
2.	17.25	139	2.264	8.262	9.446	17.709	0.432	17.277	4.840	3.561	18.555	0.44
3.	30.00	140	3.261	24.558	7.367	31.925	3.531	28.394	6.363	6.459	28.298	0.87
4.	36.79	139	3.788	33.421	3.058	36.479	4.273	32.206	5.794	7.336	30.664	1.09
5.	43.69	140	4.638	40.041	4.253	44.294	5.185	39.109	7.867	9.288	37.688	1.06
6.	51 17	140	4.110	47.380	3.450	50.830	6.705	44.125	6.592	9.881	40.836	1.16
7.	60.00	140	4.567	55.071	2.812	57.883	8.666	49.217	8.149	10.808	46.558	1.18
8.	73.08	139	4.765	65.961	3.254	69.214	11.109	58.105	7.820	12.379	53.546	1.23
9.	97.68	140	5.241	83.567	3.695	87.262	15.585	71.677	10.126	15.224	66.579	1.25
10.		140	5.404	129.795	2.459	132.254	25.795	106.459	9.694	19.291	96.862	1.34
	Total	1,396	4.016	48.808	5.230	54.038	8.128	45.910	7.253	9.667	43.495	1.12

* Towns with 1,000 or more inhabitants

Average weekly income, taxes and benefits of urban housholds, 1975 and 1976 classified by direct decile income*

Direct Income Deciles		Household (adjusted)	Persons	Direct Income	Cash Benefits	Gross Income	Direct Taxes	Disposable Income	Non-cash Benefits	Indirect Taxes	Final Income	Direct ÷ Final Income
Code	£ Limit	No.	No.	£	£	£	£	£	£	£	£	
1975 Urban												
1.		171	2.612	-	17.235	17.235	-0.051	17.286	9.408	3.690	23.005	-
2.	0.00	172	2.199	4.548	14.827	19.375	0.231	19.144	7.243	4.111	22.276	0.20
3.	13.00	171	3.027	22.643	10.320	32.963	2.836	30.128	8.282	6.651	31.759	0.71
4.	31.43	171	3.884	37.218	6.051	43.269	4.854	38.415	10.084	8.165	40.334	0.92
5.	41.75	172	4.318	45.881	4.833	50.714	5.735	44.979	10.600	9.108	46.472	0.99
6.	49.91	171	4.501	53.901	3.911	57.811	7.179	50.632	11.078	10.454	51.256	1.05
7.	58.28	171	4.434	64.603	3.837	68.440	10.301	58.139	10.421	11.955	56.605	1.14
8.	70.30	171	4.620	77.908	3.909	81.817	12.727	69.090	11.649	12.386	68.352	1.14
9.	86.94	171	5.006	98.759	3.891	102.650	17.895	84.755	12.624	16.427	80.952	1.22
10.	114.18	172	5.479	156.800	4.022	160.822	30.004	130.818	13.977	22.342	122.453	1.28
	Total	1,712	4.008	56.240	7.284	63.524	9.174	54.350	10.536	10.531	54.355	1.03
1976 Urban												
1.		199	2.716	-	20.481	20.481	-0.039	20.520	12.487	3.747	29.261	-
2.	0.00	200	2.396	4.882	17.829	22.711	0.159	22.553	9.574	4.349	27.778	0.18
3.	15.55	199	3.140	30.258	10.558	40.816	3.995	36.821	9.478	7.786	38.514	0.79
4.	40.07	199	3.745	45.434	5.434	50.868	6.607	44.261	11.036	10.803	44.495	1.02
5.	50.00	199	4.422	54.887	6.140	61.027	8.502	52.525	13.150	12.471	53.204	1.03
6.	59.71	200	4.547	65.660	4.580	70.240	10.485	59.754	14.330	14.230	59.855	1.10
7.	72.84	199	4.508	80.289	4.546	84.835	14.942	69.893	13.284	15.434	67.743	1.19
8.	88.51	200	4.543	98.827	3.390	102.217	19.475	82.742	13.737	17.748	78.731	1.26
9.	109.81	199	4.814	125.186	3.511	128.697	26.892	101.805	14.046	21.318	94.534	1.32
10.	145.45	199	5.604	194.305	3.037	197.342	47.420	149.922	18.441	28.602	139.761	1.39
	Total	1,993	4.043	69.959	7.951	77.910	13.840	64.070	12.956	13.647	63.379	1.10

* Towns with 1,000 or more inhabitants

APPENDIX 5 (contd.)

Average weekly income, taxes and benefits of urban households, 1977 and 1978 classified by direct income deciles*

Direct Income Deciles		Households (adjusted)	Persons	Direct Income	Cash Benefits	Gross Income	Direct Taxes	Disposable Income	Non-Cash Benefits	Indirect Taxes	Final Income	Direct ÷ Final Income
Code	£-Limit	No.	No.	£	£	£	£	£	£	£	£	
1977 Urban												
1.		190	2.902	-	23.848	23.848	-0.061	23.909	14.386	4.448	33.847	-
2.	0.00	188	2.400	8.401	19.188	27.589	0.437	27.152	11.692	5.241	33.603	0.25
3.	23.08	190	3.478	37.957	12.095	50.051	5.590	44.461	14.110	9.442	49.129	0.77
4.	48.00	189	3.684	54.153	5.955	60.108	8.681	51.427	11.398	11.160	51.666	1.05
5.	60.00	189	4.460	65.428	6.253	71.680	10.088	61.592	13.523	14.729	60.386	1.08
6.	71.42	189	4.498	78.586	4.746	83.332	13.857	69.475	14.441	13.914	70.002	1.12
7.	85.87	190	4.272	95.993	4.848	100.841	18.740	82.101	14.325	14.891	81.536	1.18
8.	105.69	189	4.551	117.603	4.424	122.027	24.416	97.610	15.503	19.720	93.394	1.26
9.	132.92	189	4.776	148.432	3.421	151.854	32.473	119.381	15.285	22.179	112.487	1.32
10.	170.68	189	5.219	227.354	3.006	230.359	53.168	177.191	16.609	30.596	163.204	1.39
	Total	1,893	4.034	83.394	8 777	92.171	16.739	75.431	14.128	14.632	74.928	1.11
1978 Urban												
1.		174	3.208	-	28.098	28.098	-0.062	28.160	17.514	5.224	40.451	-
2.	0.00	174	2.152	6.910	21.761	28.671	0.385	28.285	12.059	3.756	36.589	0.19
3.	21.95	173	3.113	39.807	13.866	53.673	5.261	48.412	14.687	8.509	54.590	0.73
4.	51.24	173	3.781	60.142	5.987	66.129	8.775	57.354	12.548	10.994	58.908	1.02
5.	66.75	173	4.196	73.488	5.062	78.550	11.084	67.466	14.562	11.533	70.496	1.04
6.	80.26	174	4.207	88.925	4.591	93.516	13.730	79.787	14.089	13.633	80.252	1.11
7.	96.15	173	4.567	105.356	5.503	110.838	19.300	91.539	15.981	15.926	91.593	1.15
8.	115.82	173	4.492	129.408	3.356	132.764	23.659	109.105	14.579	16.975	106.709	1.21
9.	143.53	174	4.796	160.544	4.446	164.990	32.331	132.659	16.444	20.141	128.961	1.24
10.	182.82	173	5.496	237.468	4.011	241.479	49.768	191.711	20.549	30.232	182.027	1.30
	Total	1,734	4.000	90.187	9.674	99.860	16.420	83.440	15.303	13.691	85.052	1.06

* Towns with 1,000 or more inhabitants

Average weekly income, taxes and benefits of urban households 1979 and 1980 classified by direct decile income*

	Direct Income Deciles	Households (adjusted)	Persons	Direct Income	Cash Benefits	Gross Income	Direct Taxes	Disposable Income	Non-Cash Benefits	Indirect Taxes	Final Income	Direct Final Income
Code	£ Limit	No	No	£	£	£	£	£	£	£	£	
1979 Urban												
1	0 000	167	2 891	-	33 087	33 087	-0 062	33 150	19 472	5 370	47 252	-
2	24 60	168	2 424	6 756	27 198	33 954	0 339	33 616	16 232	4 599	45 249	0 15
3	63 62	168	3 257	47 357	14 874	62 230	5 861	56 369	17 684	8 643	65 410	0 72
4	78 39	166	3 808	71 295	6 968	78 263	9 509	68 753	17 416	11 831	74 338	0 96
5	92 06	170	4 445	85 162	4 643	89 804	12 196	77 608	18 808	12 363	84 053	1 01
6	110 95	168	4 493	100 964	9 064	110 029	16 287	93 741	18 594	16 132	96 204	1 05
7	135 01	168	4 136	122 902	5 220	128 122	22 450	105 672	17 219	16 197	106 694	1 15
8	166 65	168	4 599	148 943	6 774	155 717	27 666	128 052	21 565	19 451	130 165	1 14
9	216 14	168	5 143	190 108	5 502	195 611	40 650	154 961	23 219	21 607	156 573	1 21
10		168	5 143	291 745	4 496	296 242	67 858	228 384	22 341	31 107	219 618	1 33
	Total	1,678	4 037	106 555	11 775	118 330	20 280	98 049	19 256	14 732	102 574	1 04
1980 Urban												
1		399	2 730	-	35 709	35 709	-0 096	35 805	22 131	6 599	51 337	-
2	0 00	399	2 187	10 433	30 071	40 504	0 553	39 951	17 552	6 456	51 047	0 20
3	29 77	400	2 856	54 587	13 312	67 900	5 920	61 979	17 875	11 513	68 342	0 80
4	92 79	399	3 412	82 775	8 238	91 013	10 964	80 048	18 009	16 565	81 492	1 02
5	110 08	400	3 810	101 873	5 545	107 418	16 303	91 115	18 058	16 709	92 464	1 10
6	132 47	399	4 101	121 380	7 633	129 014	21 324	107 690	19 681	19 357	108 014	1 12
7	160 47	398	4 027	145 423	5 759	151 182	26 014	125 168	20 196	21 754	123 610	1 18
8	196 91	400	4 327	177 714	5 578	183 292	36 695	146 597	23 199	26 976	142 820	1 24
9	254 69	399	4 436	222 900	6 210	229 110	48 427	180 683	23 259	30 468	173 474	1 28
10		399	5 124	353 970	5 707	359 677	81 616	278 061	28 286	40 004	266 343	1 33
	Total	3,992	3 701	127 112	12 373	139 485	24 773	114 712	20 825	19 641	115 896	1 10

*Towns with 1,000 or more inhabitants

CONCLUSION

The next largescale national HBS is not scheduled until 1987 at the earliest This means that there will be an interval of at least four or five years before the next detailed CSO income redistribution analysis can be prepared This pause provides an opportunity for assessing the type of analyses which have been completed to-date, particularly the methodological aspects and the type of results which are published The CSO would welcome suggestions on these and other points It is hoped that this paper will prompt people in this regard not only in the discussions which follow but also on a more considered basis subsequently

Finally, it is fitting that some acknowledgements should be publically recorded, firstly to those many households which participate voluntarily in the HBS over the years, secondly to the various CSO staff at all levels who have been involved in the work and finally to my colleagues Tom Keane, Deirdre O'Keeffe, Damien Malone and Nora Scott.

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DISCUSSION

D.B. Rottman: it is wıth very consıderable pleasure that I propose, on behalf of this Socıety, tonıght's vote of thanks to Donal Murphy. In one fell swoop, he has vastly expanded our knowledge about two ıssues of considerable topicality and polıcy relevance: (a) the impact of publıc expenditure and (b) the impact of taxation, both as experienced by Irish households.

Much of the materıal presented to us tonight was hıtherto unpublished or was only available ın a format that rendered detaıled analysis and interpretation either cumbersome or ıncomplete. Thus in preparing and presenting tonight's paper, Donal Murphy has himself made a substantial contribution to the equity with which

the benefit of one item of public expenditure, the Household Budget Survey, is shared Anyone familiar with the complexities of Household Budget Surveys and of the methodological and statistical issues involved in their use will appreciate the dedication and perseverence required to produce tonight's paper It is entirely fitting that Mr Murphy should be the author of what is now the most complete analysis of income redistribution in the Republic It was through his pioneering efforts, going back to the 1960s, that such analyses were undertaken in the first place in this country, and he was, in effect, the author of the two published volumes of redistribution data It is also fitting that the Statistical and Social Inquiry Society should provide the venue for the latest stage of that enterprise Previous papers by Mr Murphy, Brian Nolan, and others to the Study introduced to Ireland the issues and methods associated with redistribution studies I think that with tonight's paper the stage has been reached where we can safely turn our attention to finding ways to assimilate the results of such analyses into the policy making process. Even allowing for the limitations of income data from 1980 and the lamentable need to wait until at least 1987 for the next Household Budget Survey, I think the potential is considerable.

So in responding to Donal Murphy's work, I hope to provide a start to the shift toward policy analysis. I think a necessary first step is to emphasis the distinction between redistribution, on the one hand, and progressiveness or regressiveness, on the other The term redistribution is best defined as the change in the inequality of incomes present after taxation and/or subsidies have been distributed. So the redistribution that we measure will depend on (a) the extent of inequality found in the income concept we take as original income (usually direct or earned income), (b) on the average rate of tax or rate of benefit, and (c) the distribution of the incidence of taxes and benefits The latter term is the index of progressivity Here, following Kakwani's presentation, progressivity/regressivity refers only to deviations of a tax or benefit system from proportionality

It is an important distinction, particularly when we review the evidence on what changed over the 1970s Though the redistributive effects from the State increased, or at least were more pronounced in 1980 than in 1973, (if we use a redistributive factor measure, such as that Stark used in replying to Brian Nolan's 1977 SSISI paper) this occurred particularly through cash benefits. The contribution from increasing progressivity was minimal. The main difference between the two years is simply in the rise in the real value of what was being spent, not a more progressive form of distribution for government expenditure Similarly, though the redistributive effect from direct taxation in 1980 was far greater than that in 1973, this cannot be attributed to the small increase in the progressiveness with which direct taxation was levelled· social insurance contributions in effect became roughly proportional in 1980, having been slightly regressive in 1973. It is the rising tax rate that made taxation more redistributive in 1980 than it had been in 1973. In this, Ireland seems to fit within the syndrome identified in a recent OECD study which found that "when tax, transfer and expenditure programmes are viewed together, it is apparent that public expenditure programmes, particularly the provision of cash transfers, have been almost totally responsible for changes in income distribution which governments have brought about..." (Saunders, 1984, p 29).

This point might have been clearer in tonight's paper had the magnitude of taxation and benefit levels been accorded more prominence. The analysis of progressivity did, of course, weight the contribution made by individual programmes to the overall outcome, but this does not provide the information needed to differentiate redistribution, by, say, tax yield, from redistribution through tax incidence. This is one area that future analyses should pursue with vigour. In doing so, it would be worthwhile to connect analyses of income redistribution among households to studies of aggregate level components of growth in public expenditure areas, as, for example, those published in the most recent issue of The Economic and Social Review, which dealt with income maintenance programmes, health, and education (Maguire, (1984) and O'Hagan and Kelly, (1984). I stress this because I believe that an understanding of what took place in the 1970s has important implications for current taxation and expenditure policy. To me, the opportunity for a 1973-80 comparison is the most fascinating contribution Donal Murphy has made. The essential consistency, at least in terms of government effects, in the two years is striking, particularly when placed in the context of the changes in the levels of taxation and expenditure.

In terms of redistribution, the main difference between the two years is in the impact of indirect taxes and benefits. In 1973 they were both regressive and left the distribution of final income more unequal than that for disposable income. The 1980 survey produced the opposite effect, in line with findings from the UK and other countries. But I suspect there may be an obstacle to valid comparisons here. Both the 1973 and 1980 Irish redistribution analyses are affected by the fact that more of total tax revenue was allocated to households than of total current expenditure. In both years, about 55 per cent of current expenditure is taken into consideration However, in 1973 76 per cent of tax revenue was so considered, whereas in 1980 this dropped to 68 per cent. This occurred though the same methodology for allocation was applied in both years. What apparently changed was the structure of taxation, increasing the share of unallocated taxes in total tax revenue.

Unlike its UK counterpart, the CSO has declined to become involved in the contentious area of allocating the burden of what are sometimes termed intermediate taxes, e.g. non-domestic rates or employers' social insurance contribution. The assumptions required to make such an allocation are unavoidable. Otherwise, our comparisons over time or to, say, the UK, of the impact of taxation policy may not be fully valid. A rigorous adherence to a model of income redistribution to guide the analysis would highlight problems such as the potentially non-comparability of surveys. The extent of redistribution is the logical starting point (the redistributive factor) followed by a systematic treatment of the contributing effects. Progressivity or regressivity of taxes and benefits are but one aspect to be considered within that framework.

In part, I am asking for a middle ground, somewhere between the two published CSO volumes on redistribution, which essentially provide detailed cross-

classifications, and the highly sophisticated statistical analysis found in tonight's paper The series of studies published in Economic Trends based on the UK Family Expenditure Survey offer, in my opinion, a model for how that might be done This makes far more use of decile shares and measures of the amount of redistribution, concentrating on subgroups of the population that are likely to be of particular policy interest

I have a number of quite minor suggestions to make for such an analysis. First, I do not think that differences in household composition and household size can be dismissed as "spurious", to be eliminated by applying adult equivalence scales to all analyses. Equivalence scales are very useful as a basis for considering differences in need, but their use in a redistribution should be used with discrimination. In particular, we should exercise caution when we want to look at which families are receiving state benefits in areas like education and housing. What does the receipt of a subsidy mean to a family with a high income but many children, and what effect are we having on our measures of redistribution or progressivity if we have divided the family income by a substantial weight? Seocnd, I do not agree with Mr Murphy's willingness to accept deciles as adequate income groups for calculating Gini, Theil, or other coefficients of income inequality Table 2 of the paper makes clear that such a practice consistently leads to an understatement of the extent of inequality. It also leads to alternative estimates for the extent of inequality in one income concept that differ as almost as much as do, say, the coefficients for gross and disposable income and for disposable and final incomes for example in 1980 the redistributive factor between disposable and final incomes would be based on the reduction in the Gini coefficient from 360 to .348 (Table 5). That difference is less than twice as great as the difference between Gini estimated using 10 and Gini using 60 income groups for gross incomes in 1980 Given the small differences in measured inequality between various income concepts, we should be as precise as possible in estimating each coefficient Here, it is the responsibility of the CSO to provide estimates using large numbers of income groups or, preferably, the indices based on ungrouped estimates

In suggesting ways of building on what Donal Murphy has provided us with both in his paper tonight and in the CSO's two volumes of redistribution analysis I am confident that much useful work remains to be done. Some of that confidence is attributable to the work undertaken in recent years by A.B. Atkinson and his colleagues in the "Research Programme on Taxation", Incentives and the Distribution of Incomes"

That work both strongly supports the usefulness and reliability of Household Budget Survey-based analyses of income redistribution and suggests ways of augmenting these surveys. But more importantly, given the realities of expenditure constraints on the CSO and on most of our respective institutions in the immediate future, it provides the potential for using household income and expenditure data as a basis for evaluating policy options. This can be done by considering the implications of a policy had it been introduced at the time our income data were collected. The limitations are obvious, but Atkinson's own results are encouraging. This is important as Atkinson and his colleagues have also demonstrated that the alternative approach of hypothetical typical family situations "can be highly

misleading". (In fact, the DHSS model based on hypothetical families was found to actually represent the situation of only 4 per cent of real families, Atkinson et al., p. 64). They conclude: "The overall distribution of gains and losses resulting from tax and benefit reforms can be assessed adequately only by looking at a representative sample of families, such as that provided regularly by the Family Expenditure Survey" (Atkinson et al., p 74)

With his previous work and especially with tonight's paper, Donal Murphy has given us the potential for informed, sensible analysis of the impact of current and proposed state policies in the areas of taxation and expenditure. To ignore that potential is to select and implement policies without sufficient regard to their consequences as experienced by individuals and families. I wish to conclude, therefore, by repeating the Society's thanks to Mr. Murphy for offering us so important and comprehensive a paper this evening.

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John Roche: I have great pleasure in seconding the vote of thanks to Donal Murphy for the paper he has presented to your Society. My pleasure is due not only to the merits of the paper itself, which are considerable, but also to the fact that it represents a further development of analytical work in the Central Statistics Office (CSO).

In the course of research in recent years I was struck by the high profile of national statistics offices on the continent in regard to the analysis of national data, social trends and policy outcomes The CSO, for good reasons I am sure, has tended to concentrate on compiling and publishing basic data with occasional forays into extra curricular activity by the staff. This approach may not be making the best use of the talents of the many brilliant men and women who work in the CSO. The publication of the redistribution report, for which Donal Murphy was responsible, was a very welcome development and I hope that his present paper represents a further step in the evolution of CSO policy. The benefits of the development of the analytical side of the CSO's work would be gained not only by those involved or interested in public policy, but by the CSO itself For it is only when you begin to work with data that you

realise its limitations and how easily either its coverage or storage could be improved

Dave Rottman has raised a number of interesting points in regard to the findings in the paper From the view point of public policy, which is my interest, summary measures of income inequality, such as the Gini coefficient, are of limited practical value, even if their intrinsic meaning has any validity While it is of some interest to know if overall inequality is increasing or decreasing, the real centre of interest is why it is occurring and who is gaining and losing? The decomposability of the Theil coefficient is a very useful attribute, therefore, and it helps considerably in our understanding of the pattern of inequality By using it together with the techniques for measuring progressivity/regressivity of individual taxes and benefits, the author has demonstrated a very useful set of analytical tools.

Whatever may be the ultimate causes of inequality in the command over resources in the community, the immediate source originates in direct income. Public policy can attempt to reduce inequality in three main ways through labour market (including education) and economic policies, through taxation and through transfers Since the first two sets of policies serve economic as well as social objectives, contradiction and conflict between the three policy approaches is to be expected It is important, therefore, to isolate the effects of the various policies and to identify where and how the conflict arises For this reason I am not entirely happy with the concept of final income as used by the author and in the CSO redistribution report While indirect taxation forms part of the circular flow between taxes and benefits it differs from the other policies in the flow because they are intended to be redistributive to a greater or lesser degree Indirect taxation will always be regressive. All that can vary is the degree of regressivity and the relative importance of indirect taxation in total taxation, which has of course, a crucial effect on the regressivity. Since it is essential to isolate how the redistributive policies work, I would prefer to make a distinction between final income, i.e disposable income plus benefits in kind, and disposable consumption, i e. final income less indirect taxation net of subsidies I use this distinction in a forthcoming study relating to poverty and it does help to throw a clear light on the redistributive effects of policies that are intended to be redistributive

There is also a practical reason for making the distinction A technical problem arises in using indirect taxation based on HBS expenditure As the author points out income is understated in the HBS and in almost all income ranges it is considerably exceeded by expenditure. Hence the effect of indirect taxes are not being related to commensurate incomes Instead we got a hybrid final income that may well have distorting effects on the final distribution

The second general point I wish to emphasise is the importance of equivalence scales, and here I would take issue with Dave Rottman. Unless differences in household size and composition are eliminated analyses of household income from the point of view of measuring income inequality can be very misleading. It can be easily shown that a household with a high income and many dependants is worse off

on an adult unit basis than one with a much lower income and fewer dependants. The author demonstrates (Table 11) the effectiveness of equivalence scales in eliminating between-group differences for households of different size and composition and in eliminating confounding effects in subsequent tables. Nor should we worry unduly about the scientific exactitude of the scales. Results are not very sensitive to small variations in weights

I also hold the view that we should not underestimate the value of percentile distributions They can tell us a lot that is of practical value to public policy decisions. In the study of poverty mentioned I have disaggregated decile distributions with some surprising results. I agree with Dave Rottman that we should be careful to distinguish between redistribution and progressivity. It is particularly necessary to consider the efficiency of redistribution measures. Table 23 shows, for example, that children's allowances are progressive. Doubtlessly food subsidies would give the same result Yet both policies are grossly inefficient as a means of redistributing income or enlarging disposable consumption

It may seem ungracious to make some minor criticisms of presentation in this valuable analysis, but I have to make a few which the author might consider before publication. The expression of the relationship between direct and final income in Table 4 would be clearer if final income were divided by direct income. A similar point relates to the potential confusion over the signs of the coefficients in Tables 23 and 24, where sometimes a minus sign denotes progressivity and sometimes regressivity Whatever about the mathematics of deriving the coefficients it would be less confusing to use a positive sign to denote progressivity and a negative sign to denote regressivity, using a footnote to cover the technical aspect. In regard to the comment about the increase in inequality in direct income in 1980 compared with 1973 an important factor not mentioned was the collapse of farm incomes in 1980 In fact direct, gross and disposable income were all marginally more unequal overall in 1980 because neither transfers nor direct taxation offset the drop in direct income in the lower income groups, which include many farmers. Finally, I would contest the author's conclusion about the factors influencing within-group inequality and between-group inequality. It is certainly true that life cycle differences affect between-group differences but is it not legitimate to expect public policy to go some way towards smoothing out the difference? Horizontal equity requires that this be done As regards within-group differences, I would have thought that factors such as education, social background, etc. have far stronger influences on these differences than on between-group differences.

In conclusion may I say that I found this an immensely interesting paper. It opened new vistas for me in an area I have only touched on previously I hope that Donal Murphy will build on this work and that in the future your Society and others will receive from him and his colleagues more examples of work of this kind. I heartily join with Dave Rottman, therefore, in proposing a well deserved vote of thanks on your behalf.

Dr. De Buitleir: I am rather alarmed by the fact that the first two speakers are drawing policy implications from these data. I do not think that the conclusions in this paper can be used for policy analysis. My concerns arise mainly (but not exclusively) from the assumptions made about the incidence of taxes and benefits discussed The results are extraordinarily sensitive to the incidence assumptions and these must be critically examined in this light To proceed on the basis that the effective incidence of taxes and benefits is the same as their statutory incidence just because "there is no realistic alternative at present" calls into question the value of the exercise Could I give some examples about what I mean? Does a tax on luxury yachts bear on the rich or does it have a greater effect on the income of boat builders who may be far from rich? Why is the hotel industry concerned about the rate of VAT on hotel services, if this is borne fully by the consumer? Does public spending on health benefit the sick, or does it mainly increase the income to doctors?

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Pechman and Okner (1974) have shown that for some taxes the distributional conclusions rest crucially on whatever incidence hypothesis is chosen. We cannot avoid making some assumptions about incidence, but these should reflect the great uncertainty that exists in this area. Could I suggest that when the CSO or anybody else produces material on the redistributive effect of taxes and benefits they include estimates based on alternative incidence assumptions? At least, this would teach the unwary that they are in a minefield

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Pechman J.A., and B A. Okner, (1974) "Who Bears the Tax Burden?", Washington, Brookings

P. Honohan: Like other speakers, I have been impressed by the range of results presented in Mr. Murphy's paper. He has provided the answer to a great number of the questions which previous research in this area has begged. I am a believer in the use of age, and household composition, normalisation, though as tonight's discussion reveals, one has to be sure of just what the figures are to be used for in order to choose the correct basis for presenting the results in specific contexts.

Dr. de Buitlear has already raised the matter of incidence. I would add to his remarks that, in practice, this issue goes well beyond a simple textbook question of tax shifting. The whole structure of the economy, the rate of unemployment, the rate of inflation, and even the size of population is essentially determined by Government policy. Government actions thus strongly influence the number and levels of before-tax incomes in the economy. Assuming these pre-tax incomes fixed, is clearly inadequate in a full analysis, but so too would a simple tax-shifting assumption.

It need hardly be remarked that a table ranking tax and expenditure measures by progressivity should not be taken as an indication that the least progressive should be eliminated. Tax and expenditure schemes have an important impact on the efficiency of the economy and, so long as the overall position is one of adequate redistribution, there will be cases where the individual tax or expenditure measures which are regressive should be retained in order to facilitate other objectives. For example, the extension of the VAT base which, though probably not in all cases regressive, is certainly not very progressive, should, in time allow a restructuring of other taxes in a direction that might favour economic growth.

While one usually assumes that redistribution happens through a shrinking of the dispersion of incomes, this need not necessarily be so. Some persons may be plucked from the top of the distribution and thrown to the bottom, violating the objective of horizontal equity. It would be interesting to see whether or not this is so, using measures recently developed by M. King in a contribution to Econometrica.

While the Theil inequality measure is attractive because of its decomposability, it is still advisable to examine the Lorenz curve to see whether a movement towards greater equality has indeed been achieved uniformly over the distribution of incomes. No summary statistic fully substitutes for the Lorenz curve in this regard.

D. Thornhill: I would like to join with the other speakers who have congratulated Mr. Murphy on an excellent paper. Dr. Rottman and Mr. Roche have commented on what they perceive as the relevance for policy of the results presented by Mr. Murphy I can understand their enthusiasm but, as Dr. de Buitleir has already done, I would like to stress the need for caution in using these results for policy analysis. There are a number of qualifications which have to be attached to this data. I will mention just two. The first relates to the income data. There are two points that need to be highlighted here:

(i) The difference between household disposable incomes and household expenditures: in the 1980 Household Budget Survey, this ranged between 20 and 30 per cent for most of the weekly income categories surveyed. This is a very wide discrepancy and is more than can be plausibly accounted for by irregular or non-recurring receipts and withdrawals from savings - particularly as we know that net personal savings are positive.

(ii) The use of different reference periods for estimating income. In the case of the self-employed, respondents were free to give income data for the most recent 12 month period which was available whereas the income data for some other households relates to the period during which the survey was carried out. Consequently, in a period of significant inflation, any comparison between incomes where sources differ is likely to reflect serious distortions.

In this regard the 1980 Household Budget Survey (Volume 1, page xi) rightly points out that "comparisons between the income levels of different groups of households could be quite misleading and should be avoided particularly where income sources differ appreciably"

Some authors and analysts including Dr. Rottman and Professor Hannan have been inclinded to take the view that since the HBS is the only source of data on incomes which covers all sources and levels of income, reliance on the income data in the Survey is unavoidable (c.f "The distribution of income in the Republic of Ireland. A study in social class and family cycle inequalities, Rottman, Hannon et al; Paper No 109 Economic and Social Research Institute, April 1982). Mr. Murphy, in this paper, suggests that the deficiencies in the income data should "not be overexaggerated" In my view, for policy purposes, the data limitations cannot be underlined sufficiently

My second reservation relates to the concept of final income, particularly the approach to the inclusion of non-cash benefits I can appreciate the value of the concept but there are major short-comings in the estimation of final income which diminish the usefulness of the results for policy purposes.

(i) One is not adding like with like Disposable income, the sum of direct income and cash benefits less direct taxation, is an estimate of an individual's or household's command over those goods and services which carry a price tag, particularly goods and services available through the market On the other hand, the estimates of non-cash benefits are based on the cost of these services to the State, which Mr Murphy rightly points out need not be their utility value to the recipient The distribution profiles based on an aggregation of these dissimilar entities thus need to be treated with considerable caution.

(ii) There is also the point mentioned by Mr Murphy that the estimation of non-cash benefits is by no means complete I accept that there are difficulties involved in, for example, extending the analysis to public goods such as security, roads etc but these are services which affect personal and household welfare; their benefits are probably not spread evenly over the population and they also cost the State money.

S.D. Barrett: It is with pleasure that I join with the other respondents in welcoming this paper It will inform our discussions of income distribution for many years. It raises many discussion points including the following:

(i) The model's treatment of direct and final income: the paper assumes that final income is a supplement to direct income. It could also be seen as a substitute for direct income which could be varied in order to increase state benefits Unemployment benefit payments can be increased by the strategic conduct of individuals to secure return of their contributions. The level of disability payments claimed by married women may indicate a substitution for cash benefits for direct income rather than sickness. Benefits which are neither taxed nor means tested are more likely to be

substituted for direct incomes.

(ii) The understatement of income and non-respondents: the paper notes the problem of understatement of incomes. Allied to this is the refusal of 44 per cent of those approached to participate in the survey It is likely that those responding are those paying their full taxes and legitimately in receipt of state benefits. The characteristics of the non-respondents, if different, would be critical The paper would then apply to the white economy rather than to the total economy.

(iii) The effectiveness of cash redistribution. Table 3 aggregates the cash redistribution programmes. Disaggregation would allow us to compare the relative efficiency in income distribution terms of unemployment assistance and benefit and other major schemes such as disability payments.

(iv) producer and consumer subsidies· the paper assumes that non-cash benefits are passed on to consumers They are however likely to be transformed into producer subsidies in markets where competitive forces are weak. When unsubsidised transport costs less than subsidised transport, this indicates a subsidy to producers rather than consumers. The rapid increase in health service expenditure in the last decade is due to higher staffing and pay levels rather than either an increase in the inputs, such as bed nights in hospital, or outputs, such as an increase in health status. In education pay expenditure has dominated non-pay expenditure and grown at its expense in recent times. This also indicates an element of producer subsidy.

(v) Non-cash benefits: who are the users?: the paper allocates non-cash benefits by averaging them over identifiable recipients in the case of free education and free public transport and averaging the cost over all eligible persons in the population in the case of health services. The benefits from these services should be allocated on the basis of the take-up rate. Assuming average benefits, as in the paper, may assume away inequalities in the take-up rates

(vi) Adult equivalents: the adult equivalents in table 9 are based on the social welfare system. Shadow prices derived from valuations implicit in public policy are normally thought inferior to those implied from the conduct of people themselves. An alternative might be to derive the adult equivalents from expenditures actually incurred and recorded in the Household Budget Survey by Mr Murphy.

(vii) The results: the results depend on whether the sample of households is representative of the economy as a whole, the extent to which taxes and subsidies are shifted or transformed, and the substitution of state benefits for direct incomes. Alternative hypotheses on these issues might be examined. Mr. Murphy's results would indicate to me that, since the tax rate is already 73 per cent at 1.5 times average income, further income distribution may have to widen the tax net, include cash benefits in taxable income, and restrict non-cash benefits to the target groups.

K.A. Kennedy: In joining with previous speakers in congratulating Mr Murphy on an outstanding paper, I would like to raise a query and also to contribute to the debate on policy issues that has arisen from this paper The query relates to Table 24 In that table, both the Kakwani and Suits measures suggest that redistribution is effected far more through State benefits than through taxes. The broad picture is that direct taxes emerge as somewhat progressive and indirect taxes as regressive, so that the overall position in regard to taxes is not very progressive, and possibly even slightly regressive. On the other hand, non-cash benefits are quite progressive and cash benefits even more so That is also the broad picture that has been revealed for the generality of advanced countries

An entirely different picture, however, emerges from the regression elasticities in the same table, which suggest that total taxes are far more progressive than total benefits Looking at the elasticities for the individual taxes, the magnitudes seem somewhat dubious For example, the elasticity of 4.1 for income tax, suggests an extraordinarily high degree of progressivity. Admittedly the calculations are based on adult equivalents and using expenditure rather than disposable income Nevertheless the coefficient seems implausible and I wonder if there is anything spurious about the way it is estimated.

Turning now to policy issues, Dr Rottman in proposing the vote of thanks emphasised the importance of distinguishing between redistribution and progressivity/regressivity. I hope that everyone would agree that redistribution is the more important of the two, because it is one of the objectives of policy, though not of course the only objective of policy. Progressivity is not an objective of policy but rather an instrument for achieving redistribution There is therefore no inherent merit in progressivity per se: rather the degree of progressivity must be assessed by reference to its impact on the major objectives of policy

It is of course true that with greater progressivity in taxes and benefits, it is possible to achieve more redistribution for any given level of government expenditure and taxation. But this merit of progressivity must be tempered by other considerations There may be limits in practice on the degree to which individual taxes and benefits can be made progressive without adverse effects on other policy objectives. It should also be emphasised that a proportional, or even a somewhat regressive tax, can lead to greater redistribution provided the revenue arising is spent on benefits that are more progressive.

An example is the imposition of VAT on clothing in the 1984 budget It could be argued that this was slightly regressive. But even if it was, it remains true that the tax will secure a much greater absolute amount of tax revenue from the rich than from the poor. Even if we could do no more than transfer this revenue back in equal absolute benefits for everyone, the poor would be better off and the rich worse off, so that a considerable amount of redistribution would have been achieved Of course if the revenue is devoted to benefits that are progressive, so that the poor receive a greater share of them, then the degree of income redistribution effected is even greater.

It is however only right to point out that there are two main snags in this approach to redistribution First it tends to raise further the share of government revenue and expenditure in total GNP Secondly, while the overall effect is redistributive, it could still gravely worsen the position of individuals who are not caught in the social welfare safety net For example, if there are poor people who are not in receipt of any State benefits, their position is made worse by having to pay the VAT on clothing

Finally it is important to emphasise, as some other speakers have, that taxes also affect income redistribution by their impact on direct incomes Taxes may, for instance, act as a disincentive to private sector employment On the other hand, a majority of those present here tonight are in receipt of direct incomes that are entirely financed out of taxation It is a moot point how many of us would otherwise have any direct income at all!

B. Nolan: the problem of understatement of income by HBS respondants has been referred to by several speakers. Mr. Murphy in his paper has mentioned the difficulties which arise in trying to assess the degree of understatement by comparison of grossed-up annualised HBS income estimates with personal income aggregates in the National Accounts. This comparison cannot be adequately made on the basis of published National Accounts data for a number of reasons, the most important of which is the large non-household income component included in personal-sector income i.e. income accruing to pension funds, etc. This means that the comparison can only be done by the CSO on the basis of the more detailed information available to them. It is very important that the results of such an exercise be available, given that diferences in the degree of understatement between income types can be substantial. This has been shown by studies such as that by Atkinson and Micklewright, mentioned by the speaker, using data for the UK (where more detailed National Accounts figures, covering the household sector only, are available). Such differences can make a significant impact on both the shape of the income distribution and on the perceived redistribution by taxes and benefits.

With reference to the speaker's intentionally provokative suggestion that income differentials between households at different states of the life cycle, etc., may be deemed acceptable, this might indeed be considered an extreme view when we are looking, as he was, at incomes adjusted by equivalent scales. Such incomes have already been adjusted for the differences in needs between households of different types Apart from the differences in household size/composition for which equivalent scales are intended to adjust, perhaps the principal difference in financial commitments between households at different stages in the life cycle are those with respect to housing.

Those owner-occupiers who have paid off mortgages have significantly less expenditure committed than those in the early stages of mortgage repayments or in rented accommodation, and these differences will be closely correlated with stages

in the life cycle. One way in which such differences could be taken into account would be by the inclusion of imputed income from owner-occupation, less current mortgage outlay, in household income. Having made such an adjustment to incomes on an adult equivalent basis, remaining differences between the incomes of households at different stages in the life cycle might then be a reasonable focus for concern

Reply by D.C. Murphy: I would like to thank all speakers who commented on the paper and to briefly respond to some of the points raised.

I fully agree with *David Rottman* that differences in household composition and size cannot be dismissed as spurious in analysing the redistributive effects of State taxes and benefits. I am sorry if I gave that impression; it certainly was not intended. This is, in fact, the aspect of the redistributive process which the published CSO reports concentrate on. In my paper I was concerned mainly with making comparisons between different types of households and between different time periods. Differences in household composition and size must be eliminated in such analyses and it was only in this particular context that I characterised their effect as being spurious.

As regards Dr. Rottman's misgivings about my estimation of Gini coefficients from decile income distributions, I should explain that this approach was adopted simply because exact decile classifications of results were being presented for the first time. These estimates, of course, consistently understate the extent of inequality to some degree because the within-decile income inequality is not taken into account. As shown in Table 2 the under-estimation of the true gross income Gini coefficient was 0 008 for both 1973 and 1980. In fact, the under-estimation is of this order for all four income concepts in both years Because of this, decile based coefficients can be used to provide reasonably consistent estimates of the differences in the degree of inequality for the various income concepts and periods. This was my main interest in the paper rather than the precise determination of absolute inequality levels.

Others no doubt share John Roche's view about the confusion between the positive and negative signs in the various progressivity measures presented for taxes and benefits in Tables 23 and 24. In fact, I had contemplated doing what he suggested, but I then encountered difficulty in describing the technical aspects. I am afraid there would have been confusion either way. This problem arises, of course, because taxes and benefits are being jointly discussed

The fall-off in farming income in 1980 did influence the level of direct income inequality. However, this did not contribute very significantly, as Mr. Roche had surmised, to the increase in the level of direct income inequality between 1973 and 1980. To demonstrate this I repeat the livelihood status classifications for 1980 (Table 15) and 1973 (Table 18) distinguishing rural farm households (as defined in CSO reports) with self-employed HOHs. This table shows that the higher level of

direct income inequality of farm households in 1980 was offset by a reduction in their number since 1973. As a result of this the between-group inequality contribution (where the 1973/1980 difference arises) is not affected very much when rural farm households are separately segregated.

Segregation of Rural Farmers in Tables 15 and 18

Livelihood Status of HOH	Household Basis No of households (adjusted)	Direct Income Theil Coeff	% Contrib	Final Income Theil Coeff	% Contrib	Adult Equivalent Basis Direct Income Theil Coeff	% Contrib	Final Income Theil Coeff	% Contrib
1980									
Self employed									
Farmer*	1127	0 190	14 3	0 129	22 8	0 154	10 8	0 089	21 8
Other	520	0 140	6 2	0 087	9 4	0 107	6 2	0 079	12 5
Employee	3387	0 058	22 5	0 052	32 9	0 062	25 0	0 038	37 3
Out of Work	460	0 530	5 2	0 081	4 6	0 480	9 6	0 028	2 1
Retired	983	0 475	11 8	0 077	7 9	0 338	12 7	0 036	7 4
Other	708	0 499	10 1	0 116	8 8	0 345	10 5	0 045	7 2
Sub-Totals									
Within Group		0 119	70 0	0 075	86 5	0 112	68 8	0 048	88 4
Between Group		0 051	30 0	0 011	13 5	0 051	31 2	0 006	11 6
State 1980	7185	0 170	100 0	0 086	100 0	0 163	100 0	0 054	100 0
1973									
Self employed									
Farmer*	1703	0 166	23 6	0 136	31 9	0 144	21 1	0 102	34 0
Other	538	0 102	6 1	0 120	9 6	0 107	6 9	0 110	13 0
Employee	3280	0 056	29 2	0 053	25 2	0 058	22 0	0 039	26 4
Out of Work	380	0 414	4 7	0 104	3 6	0 378	3 4	0 038	1 6
Retired	818	0 293	10 2	0 113	7 4	0 268	10 9	0 063	7 3
Other	1020	0 350	13 8	0 153	11 0	0 309	14 8	0 058	9 2
Sub-totals									
Within		0 120	78 5	0 091	88 6	0 115	79 0	0 063	91 4
Between		0 033	21 5	0 011	11 4	0 030	21 0	0 006	8 6
State 1973	7739	0 153	100 0	0 102	100 0	0 145	100 0	0 069	100 0

* Rural farm households as defined in HBS (i.e. rural household with farming activity in which HOH has occupation 'farming') where HOH is self-employed - this excludes 25 and 63 rural farm households (adjusted) in 1980 and 1973, respectively, where HOH was either an employer, engaged in home duties or retired with another member of the household running a farm.

Donal de Buitleir questioned the usefulness of the CSO analysis for policy purposes because of misgivings about the assumptions made regarding the incidence of taxes and benefits. He suggested that estimates based on alternative assumptions should be provided in such analyses. It is very easy to use different incidence assumptions, but, to my knowledge, there is no general concensus on any particular set of them. If he, the Commission on Taxation, or anybody else have analyses or evidence supporting any alternative assumptions, the CSO would only be too glad to consider them. It is worth nothing that in the analyses of tax burden in the US by Pechman and Okner, which Dr. de Buitleir mentioned, the authors express no preference for any of the various assumptions about tax evidence which they applied "because there is as yet no conclusive empirical evidence on the incidence of some of the

major taxes" (page viii) Indeed, it is interesting to note that for the taxes covered in the CSO analyses Pechman and Okner applied the same, i.e. statutory, incidence assumptions It was only in the case of corporation tax, property tax, employers contribution to social insurance, etc not covered by the CSO that they applied alternative incidence assumption. Cautionary remarks were also made by Dan Thornhill, but these cover points already dealt with in the paper

Both Professor Kennedy and Mr Rafferty raised the interesting point that the regression method based on variables expressed on an equivalent adult basis may have introduced some spurious progressivity. This regression approach was adopted simply to be consistent with the basis used to compile the Kokwani and Suits progressivity measures Ordinarily, disposable income (and total expenditure) per household and household size (or equivalent adults) would be used as separate independent variables in this type of regression analysis

Brian Nolan made the point that in addition to variations in household size/composition there are also significant differences between households in housing financial commitments The inclusion of imputed income from owner-occupation (less current mortgage outlay) in household income is, as he suggests, one way of allowing for this. The estimation of imputed rent, i.e. income, for owner occupiers is a common feature in household expenditure and income surveys internationally The imputed rent appropriate to a particular owner-occupied dwelling is generally imputed in these instances on the basis of the rent of comparable, i e type, age, location, size, facilities, privately-rented furnished accommodation. This is almost impossible to do in sample surveys in this country because of the predominance of owner occupied accommodation and the very small numbers of comparable privately rented dwellings which they can be matched with for imputation purposes. Despite the merits of Mr. Nolan's proposal it is unfortunately not a very feasible proposition in Irish circumstances