

# **Tibor Barna: The redistributive impact of taxes and social policies in the UK: 1937-2005**

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## **Editorial Note**

The author is Professor Emeritus at the LSE and Co-Director of CASE.

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## **Abstract**

Regular annual studies made by the Office of National Statistics in the UK are intended to show how far taxing household incomes and giving benefits in cash and kind to households redistributes income from rich to poor. The first attempt to do this in the UK was made by Tibor Barna for the year 1937. Subsequently his approach has been replicated and elaborated. This study reworks and compares data from various studies to see how the scale and nature of the state's redistributive role has changed over the past seventy years. Differences in methods and data make comparisons difficult but some broad conclusions can be drawn. Some methodological issues are also discussed on the question of how to approach household equivalisation when services in kind are treated as income.

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## 1. The motivation for the study

The tax and social benefit policies governments choose to adopt change the distribution of incomes and services that households have at their disposal. The sheer scale of this intervention is often underestimated. I always began my lectures on the subject by asking students to suggest, on some rough order of magnitude, the extent to which the top income groups were taxed and the bottom, say twenty per cent, had their incomes increased by state tax and benefit policy. Rarely did my students do anything but seriously underestimate the scale of the state's impact.

The most recent figures suggest that before such state intervention the incomes of the richest fifth of households in the UK were 16 times those received by the poorest fifth. After taxes and benefits this ratio falls to four to one (Jones 2006).

This is an accounting result, of course. The real counterfactual is difficult to set. If the poor had been left to starve there might have been a revolution that put the poor in charge or, a different political view point, voluntary agencies might have sprung to the rescue, more jobs might have been created and a different employment equilibrium have emerged, more favourable to the poor. Nevertheless, these figures provide an interesting and important insight into the effect of marginal changes to tax and benefit policy over time.

Each year the National Office of Statistics (NSO), and before that the Central Statistical Office (CSO), produce estimates of the redistributive impact of taxes and benefits. They have done so since the early 1960s, using data from 1957 and 1959, and on one occasion back to 1953, and then annually (CSO 1962; Nicholson 1965; 1974). The CSO and its successor subsequently published this assessment annually in the official journal *Economic Trends*. There have been critics of and adaptations to the methods used over time, but the series remains a regular source for academic commentary and political debate. (For critics see Peacock 1954; Webb and Seive 1971; Sefton 1997; 2002. The latest survey, including an account of the current methods used, is to be found in Jones 2006.)

The father of this whole approach was a Hungarian Ph.D. student at the LSE during the Second World War – Tibor Barna who was supervised by Nicholas Kaldor. His thesis was subsequently published as a book (Barna 1945). There had been some previous work in the USA on the question of the state's redistributive role including the benefits it provided (Stauffacher 1941). In the UK Colin Clark (1937) had raised the whole question of the state's redistributive role and how it should be represented in his work on the National Accounts but had not produced a detailed answer. This Barna set out to do.

He provided a conceptual framework that is still the basis of such studies. He began with the distribution of income that is produced by the market for labour and the rewards to capital as others had done but then went on to show what impact direct

taxes and indirect taxes had on various income groups. These had been done as separate exercises before but not looked at as a whole. He then went on to add the impact of benefits received both in cash and kind and to integrate the whole into one account of the state's redistributive role.

It is a tribute to him that the conceptual framework used today in the official annual study of redistribution is essentially the same. However, in Barna's time there was nothing comparable to the modern national survey of household incomes and spending on which to base his work. He was driven to rely on ingenious manipulation of administrative sources and contemporary poverty surveys to estimate the distribution of benefits and the incomes of households below the range covered by the income tax system. Income taxes then only affected a minority of the population.

His work was later elaborated on by several authors whom we discuss later but the whole enterprise took a major step forward in the 1950s when Nicholson, a statistician at the Central Statistical Office began to use the Family Expenditure Survey, as the statistical basis for the analysis. It was a national sample of households' spending and income that had been originally designed to provide weights for the consumer price index. That kind of data has remained the foundation for official studies ever since. However, the conceptual structure and logic is still more or less exactly that used by Barna.

The consequence is that though there has been work estimating the impact of the state on income distribution for sixty years it is only the figures for the last twenty five or so which are published on a fully comparable basis (Jones 2006).

The motivation for this paper was therefore to see whether it was possible to construct something like a time series for the period since 1937 – beginning with Barna's data. The questions that then might be answered would be:

- How far has the state's redistributive impact changed over the period?
- What tax and benefit policies contributed most to that outcome?

Barna himself pointed out that such studies are fairly meaningless as one off accounts.

'The amount redistributed in 1937 is of real interest only when comparison is made with the amount redistributed at other times or in other countries.' (p234)

Just so.

## **2. Barna's theoretical contribution**

Barna (1945), as we have argued, set the theoretical framework for subsequent empirical work. Before embarking on a detailed description of his sources and methods he reviewed the previous literature and discussed the theoretical issues involved:

- Who may be said to shoulder the burden of different kinds of tax? How far are employer's national insurance contributions merely shifted from employers onto consumers, for example? He concluded that we should assume that employers do pass on their social insurance contributions in prices over the long run and such contributions are thus similar in their impact to an indirect tax (see page 104). That conclusion has been reached by later economists and is adopted in the official surveys today.
- How should we define and measure income? What is the appropriate basis for measuring the receipt of income, the individual or the household? How do we define a household? He settled on the 'economic family' (p19) – the tax unit or household. Here we still follow. He also recognised that income was redistributed *within* the family, though he argued that 'this is not interesting from an analytical point of view' (p19)! Here modern scholars would disagree but we still do nothing about it.
- How do we assign the value of benefits in kind received by a household? He settled on the average sums spent on services received by households of a given size though his ability to do this in detail was restricted. Again the modern approach is the same and not that much more sophisticated .
- He drew the distinction we still use today between *horizontal* re-distribution of income through a life time and *vertical* re-distribution from rich to poor (p19).
- He also addressed the problem that households were of different sizes and this needed to be rectified by weighting families according to the number of people dependent on the income generated by the household. He had limited data on which to do this and did not have the theoretical basis for doing so by age and type of dependent but he made some attempt to 'equivalise' which we discuss later.

In short, most of the debates that currently surround the methods used in the official studies, as well as the solutions he adopted for pragmatic and theoretical reasons, laid the foundations for what we do today.

Similar, too, were the stages in the analysis he used. He began with the 'initial distribution of income' before state intervention. We call this 'original income'. He then took off direct and indirect taxes paid by households and added 'divisible' benefits that could be allocated to households both in cash and kind – services like health and education. He also tried various tentative estimates of the value of indivisible benefits – a public good like security provided by the police, for example, and to allocate these to different income groups. He had little confidence in these results and shows them separately.

Overall, we can say that Barna's approach was similar enough to those used today to try a comparison.

### 3. Barna's sources and methods

*Income:* By far the most important problem that Barna faced was that there was no national survey of individual households' income and expenditure of the kind we have today. The Inland Revenue returns for 1937 provided him with his basic data for the higher income groups. This was a reasonably good source for the 10 million tax units who came within potential income tax liability but it excluded about 12 million households below that limit. It did cover two thirds of all income. He used various social surveys of the incomes of the poor and figures of public assistance receipt to get some estimate of the extent of incomes below the income tax threshold, the numbers involved and the family composition. Above the tax threshold he used Inland Revenue data on dependents to undertake a crude kind of equalisation. He assumed all household members, whether children or adults, counted as one, recognising this was too crude. He also, more oddly, assumed after some discussion, that family size was equal across the income bands of tax payers. (We adjust for this in our recalculation as we describe below.) He included small sums that were estimates of imputed income derived from Coop dividends and other small sources that are not statistically important.

*Taxes:* The Inland Revenue returns gave him as good a picture of taxes paid at the top end of the distribution as we can expect from any tax returns. We discuss this problem further later. In making his estimates of the burden of indirect taxes he was helped by a recent official study of 'The Burden of British Taxation'(Cmd. 6347, 1942) and a range of academic studies, for example, on families' spending on food (p150).

*Benefits:* Barna used administrative returns to allocate cash benefits to income groups. Most went to the broad lower income band he had to use. More difficult was the allocation of benefits in kind. Two of the categories he included in the 'divisible' group were spending on road travel and the protection of property by the police. When it came to deciding how to do the former he assumed that the receipts of the road tax were spent on roads. So he allocated back the tax on each income group as a benefit derived from that tax. This meant the redistributive impact would be neutral, as he accepted (p 200). He was merely making the point that this kind of spending is likely to benefit some parts of the community more than others. It is a point we could recognise today.

Similarly he tried to allocate the benefits of the protection of property differentially - a legitimate Marxist argument! The sums he actually reallocated were very small though and do not materially affect his figures. However, the bigger issue of how to think about the distributive benefits of policing, let alone defence, is one these studies have skirted round ever since (for an early discussion see Peacock 1954).

The bulk of the benefits in kind in 1937 derived from education, health, indoor relief and social security.

Barna divided the education budget by school age levels much as we do today. Nearly seven and a half per cent of the population did not use state schools, he was able to deduce, similar to today. Since a similar percentage of households had incomes over £400 a year he allocated no benefit of state elementary education benefit to that income group. This was perhaps too crude but probably not all that far out. He *was* able to make estimates of which income groups benefited from state secondary education, which was then provided free only on the basis of a means test. He was able to estimate what percentage of university students came from families with over £ 400 income. He calculated the rising chances of university entry according to household income using contemporary social studies and allocated benefits of university costs accordingly. Here, it seems to me, he was ahead of the official methodology today (Sefton 1997; 2002). He assumed benefits from health spending were proportionate to the size of the population group though he accepted that it should probably be more pro poor.

*Overall:* Barna thus had relatively good information on incomes in slightly less than the top half of the income distribution, some data on poorer families from social surveys of the day, public assistance records and as good official data on the incidence of the whole range of taxes as economists of the day could provide. Benefit data was more rough and ready but the approaches he used to allocate it were mostly consistent with what we do today and in some cases better.

The one big difference was his failure to fully equalise the incomes of different household groups. Yet the raw data he used in his discussion on the subject, drawn in part from the Inland Revenue's information on adult and child dependents and social surveys of the time, does provide a basis for rectifying that deficiency, at least in part, by applying modern equalisation weights based on the number and types of dependents by income group.

Another difference between his final data and today's was Barna's presentation of the overall statistics. His simple descriptive account is very close to that of the modern studies. He shows the percentage of income in each original income band that is redistributed. He also summarises this data in the form of a graph showing the percentage of the population receiving given shares of total income before and after taxes and benefits (Fig 19, p227). He does *not* plot this by cumulative income shares and does not produce a summary Gini coefficient for each stage in the redistributive process. This is now done by ONS and it makes it much easier to see what is happening. Nevertheless, it is possible to produce a lower bound estimate of the Gini coefficient implied by his grouped data using a programme supplied by Professor Frank Cowell at the LSE. (Inec, Distributional Analysis Research Programme, STICERD).

In short, Barna's study is close enough in conceptual terms to what is done today to justify an attempt to put his data into a form that is roughly comparable with today's figures, albeit with the many reservations we enter later. Indeed, the founder of the

modern official series did exactly that in the 1970s, though only with data from the non retired population (Nicholson 1974).

#### **4. Cartter's study**

Various individuals followed up Barna's work without fully replicating it (Weaver 1950; Peacock 1954). The closest attempt to do so, and to compare the results with America, was undertaken by a Yale Ph D student using data for 1948/9 (Cartter 1955). One significant difference was that he failed to include locally raised taxation – the rates- and the expenditure it financed in the study. This amounted to less than five per cent of all tax revenue. This tax was probably then mildly regressive – there was no equivalent of the council tax benefit. Thus his overall results may have slightly exaggerated the redistributive effect of taxation.

Cartter also had to rely on updating the material Barna had used on the distribution of consumer expenditure and hence the indirect tax burden. He used the Inland Revenue returns for those paying direct tax- by then a larger percentage of the population. The tax exemption limit had only risen from £125 to £135 despite the rise in incomes during and after the war. In this sense his income coverage was better than Barna's since it extended further down the income range.

The conceptual basis and the practical steps taken by Cartter were the same as Barna. He compares his and Barna's findings in the text. Rather more caveats, or uncertainty, surround Cartter's data as we discuss in more detail later.

He did not attempt to equalise his household data but discussed the issue and showed the numbers and types of dependents from the tax returns analysed by income group. This enables us to roughly equalise in the same way as we did with Barna's data.

Cartter did employ a summary statistic to measure the scale of inequality at each stage. It was not the Gini coefficient but what we call the Robin Hood Index today.<sup>1</sup> It is possible to recalculate this as a Gini coefficient as with Barn's data.

#### **5 The CSO/ONS studies**

It was not until the late 1950s that another major methodological break through occurred. J.L. Nicholson working in the CSO recognised that the Family Expenditure Survey which was used to estimate consumer expenditure, and hence the weights for

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<sup>1</sup> The Robin Hood Index uses the Lorenz curve but measures the maximum vertical distance between it and the line of equal income. It has the effect of measuring what share of total income would have to be transferred or redistributed to achieve full equality.

the consumer price index, could be harnessed to this very different purpose. It could produce estimates of spending by income group on different items from which the levels of indirect tax paid could be estimated. In addition, as a check on the expenditure figures, households were asked to make income returns. From this it would be possible to produce estimates of original incomes and direct tax. There would be much better data on gradations of low income. The down side was that the sample size was initially very small, three and a half thousand households,<sup>2</sup> and the sample at the top was too small to capture the long upper tail of the distribution. This was the opposite to the strengths of Barna's study that had used Inland Revenue data. Moreover, critics found some errors in the CSO data which led to too many low income units being introduced (Prest and Stark 1967). The Family Expenditure Survey sample was later to be substantially increased and steps taken to improve the representation of high incomes. The same authors also criticised the absence of any equalisation and tried to correct for it.

It was not until the mid 1970s that Dr McClements in the Department of Health and Social Security developed equivalence scales which gave different weights to members of a household reflecting the effect they have on family spending patterns. This method is still used in today's official surveys (see Jones 2006).

The impact this change made on the figures was considerable (CSO 1990). In 1987 the reduction in the Gini on the old basis between original and final incomes was sixteen points. The comparable drop in the new ONS series was *twenty-one* points. More benefits go to families with dependents and that is now reflected in the new approach. The break in the series because of the introduction of equalisation in 1987 makes it impossible to use the CSO's early studies as part of a proper time series.

Nicholson himself did, however, compare the results of the CSO studies in the 1960s with Barna's work. He did not equalise either his or Barna's households but he did exclude retired households from both which he thought mitigated the effect of changing household composition caused by the rising numbers of old people. But it meant he also missed out one of the big reasons why redistribution may have been greater in the 1960s.

He concluded:

‘ Professor Barna's estimates for 1937, though using different sources of data and somewhat different methods and so not strictly comparable with ours, showed a surprisingly similar degree of inequality of income before and after redistribution, and a similar reduction in inequality from all taxes and benefits, to those shown in recent years.’ (Nicholson p81)

We show his figures for interest below though readers should be aware of the limitations he put on them.

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<sup>2</sup> The modern equivalent, the Expenditure and Food Survey, has 6,200 respondents.

Equivalisation is clearly an important step forward but it does raise a difficult technical problem for the approach that Barna used. The whole basis of equivalisation is that family spending is affected by the size and age structure of the family. An income of a given size is worth less to a household of four than to a single person household. The equivalence scales were derived from a study by McClements at the DHSS of family spending patterns on goods and services and the impact family size and composition had on household spending patterns (see Jones 2006 p96). From this it was possible to deduce, for example, how much impact a young child or teenager made on the family budget. Hence a weight could be applied to each member of the household reflecting the impact they made on spending. A teenage child counts as equivalent to about one third of the head of household and an eleven year old a quarter, for example. These weights can be applied in calculating the 'size' of each household for income distribution purposes. This works well for spending in the market place and hence in measuring the value of cash incomes for a family. But most families do not spend much on services like health and education which the state provides free. How are the ONS to equivalise household size when income is in kind not cash? Deriving a Gini coefficient for the final stage in income distribution was just not possible any longer the ONS (or its predecessor) argued. As a result they ceased the series produced prior to 1987 showing the overall impact of state spending and taxing in reducing the Gini coefficient. From then to the present day they do so only for *cash* redistribution.

They explain their position thus:

‘Strictly speaking, one could argue that the equivalence scales used here are only applicable to disposable income because this is the only income measure relating directly to spending power. Since the scales are often applied, in practice, to other income measures, we are content to equivalise original, gross and post-tax income for the purposes of producing Gini coefficients (and in the tables giving shares of total income). However, we do not think it is appropriate to equivalise the final income measure because this contains notional income from the benefits in kind (for example state education): the equivalence scales used in this analysis are based on household spending and so do not, therefore, apply to such items as notional income.’ (Jones 2006 p97)

However, the ONS is somewhat inconsistent. In the tables which show how far each income group gains and loses from taxes and benefits it *does* include the gains from benefits in kind. The income ranges used to present these results are of *equivalised* income. In the final row of these tables the gains and losses for the households concerned are all added together including the gains from services in kind.

It might seem consistent with the reasoning above the ONS should not include gains from benefits in kind in the same table nor should they sum the totals of incomes in cash and kind for the same reason as they do not in the Gini coefficient table. That would destroy much of the purpose of the exercise and ONS draw back from doing so in the main tables. However, they do apply the strict logic, as they see it, to exclude in

kind benefits from the calculation of an overall Gini coefficient. By doing so, they make comparisons over time of the *full* impact of redistribution impossible, and hence as Barna saw it, destroy much of the purpose of the exercise. This could be particularly important in a period in which there has been a switch towards in kind spending and away from cash benefits.

The approach is inconsistent in a deeper way as the first sentence in the above quote hints. Family spending patterns depend critically on the scale of state activity. If the state were to provide no free schooling or cash support for schooling but require children to go to school, for example, then the available cash available for parents would be much reduced. At each stage in the process of withdrawing taxes and giving benefits a different spending pattern is implied by virtue of the services those taxes make possible. Thus applying the strict ONS logic a separate equivalence scale would be needed for each step in the process of tax and benefit allocation. Such a scale is empirically impossible to deduce as we do not live in a society with no free education or health care. There are no household spending figures to help us except, perhaps, from those who use private services now. Faced with this dilemma the ONS takes a pragmatic line and says – well, let us use the only data we have which analyses market spending in a society where the key service are free. It is not perfect but so be it. They take this approach for the first three stages in the process of calculating the Gini but not the last.

Despite their reservations, the ONS did re-calculate the Gini series for me back to 1977, including benefits in kind. It is these figures which I include below with the ONS reservations (see Table 1).

However, another way of thinking about the problem is that it is not so much the final stage in the process that is the problem but the first. In the ‘original position’ as it were families with children would have to pay medical expenses, schooling, full child care costs. Instead of children aged 11 being weighted as equal to a quarter of an adult, school fees of, say, £5,000 or more a year would have to be paid. This would bring the child’s costs and equivalence score much nearer to that of an adult. An equivalence scale appropriate for this original position would make families with children appear much poorer and the original level of inequality greater than it is now.

If we assume that the political market works well and we spend as a state on children what parents would spend if they had the same average incomes over a lifetime as they now do then we might adopt an equivalence scale that reflected present spending as society’s revealed preference spending on children. Or we could use spending data from families who use the private sector or a mixture of both. The Gini for original incomes would then be higher. The effective incomes of families with children would be lower.

**Table 1: Gini coefficients (per cent) for the distribution of income at each stage of the tax-benefit system, 1977 – 2004/5 for all households**

Year	Original	Gross	Disposable	Post tax	Final
1977	43	30	27	29	23
1978	43	29	26	28	22
1979	44	30	27	29	23
1980	44	31	28	30	24
1981	46	31	28	31	24
1982	47	31	28	31	25
1983	48	32	28	31	25
1984	49	31	28	30	25
1985	49	32	29	32	26
1986	50	34	31	35	28
1987	51	36	33	36	30
1988	51	37	35	38	31
1989	50	36	34	37	31
1990	52	38	36	40	33
1991	51	37	35	39	32
1992	52	37	34	38	31
1993	53	38	35	38	31
1993/4	54	37	34	38	31
1994/5	53	37	33	37	30
1995/6	52	36	33	37	29
1996/7	53	37	34	38	31
1997/8	53	37	34	38	31
1998/9	53	38	35	39	32
1999/00	53	38	35	40	32
2000/01	51	38	35	39	31
2001/2	53	39	36	40	33
2002/3	51	37	33	37	30
2003/4	52	37	34	38	30
2004/5	51	36	32	36	29

**Source:** ONS personal communication

**Note:** The ONS do not think it is appropriate to equalise the final income measure because this contains notional income from benefits in kind. The equivalence scales used in the original articles are based on household spending and do not therefore apply to such items as notional income for education.

If one then moved to a situation in which education was free, and health too, the present equivalence scale could be used. The reduction in inequality would show up as the result of a change in the equivalence scale! Then the other stages in the process could go ahead - the world of cash and preferences expressed in a market place absolved of the need to pay for education and health.

It seems that there is a case for re-examining the present approach to equalisation and benefits in kind.

The very notion of expenditure on health care or disability being a benefit has been seen as a problem. Are we right to think of such benefits as income at all? However, if we do need care, or to insure ourselves in case we may do, and have to pay for it, that is equivalent to a loss of income we could spend on other things. Here, it seems, Barna and present practice is right.

## 6. Comparing the studies over time

The figures below are calculated and sourced in the ways described above. They are not a proper time series as they are based on such different sources and methods. However, some interesting trends emerge especially in the relative impact of different kinds of state redistribution. We make some tests of robustness and point out the difficulties in the following section.

**Table 2: Inequality in incomes before and after taxes and benefits. 1937 - 2005  
(Gini coefficients expressed as a percentage)**

Year	Original market income	Gross (plus cash benefits)	Disposable (after direct taxes)	After all taxes	Final income (including benefits in kind)
1937 +	37	33	29	29	28
1949 +	26	21	16	16	14
1961/2*	31	25	23		24
1969*	33	25	23		25
1977	43	30	27	29	23
1987	51	36	33	36	30
1997/8	53	37	34	38	31
2001/2	53	39	36	40	33
2004/5	51	36	32	36	29

**Sources:** See text

1936= Barna 1945; 1937 = Cartter 1955; 1961/2 and 1969 =Nicholson 1974; 1977-2004/5 ONS Personal communication (see Table 1 including the ONS reservation).

\* Non retired only, and unequivalised

+Lower bound estimates

The years shown reflect the availability of the source material. The figures for 1937 derive from Barna's study and 1948 from Cartter's. 1961/2 is the beginning of Nicholson's 1974 series and 1969 the end of what he claims to be comparable figures. 1977 derives from first year of data in the ONS series derived from a personal communication from ONS. I have then given ten year gaps. 2001/2 is the peak, so far, of the post 1977 inequality in original incomes. 2004/5 is the latest data we have from the ONS consistent with Jones (2006).

## **7. Robustness and caveats**

### ***Confidence limits***

Putting firm confidence limits on any of the early material is impossible. It does not derive from survey material but from estimates made on the basis of tax returns administrative data which are subject to errors of reporting. The tax returns which form the basis of the higher income categories are suspect, especially at the top end, as people find ways to avoid declaring their full income to the tax authorities. Again, we discuss this later. Some of the same problems arise with household surveys which are also deficient at the top end though attempts have been made to rectify this in recent years.

The ONS figures derive from national sample surveys and here estimates of sampling errors can be made in the normal way. In the case of the Expenditure and Food Survey the standard error for average gross household income is about 1.1 per cent – ie there can be 95 per cent confidence that the true figure is within 2.2 per cent of the reported one.

However, the modern studies still have to make fairly crude assumptions about how much financial benefit a household derives from free education or health, for example. Again this is discussed more below.

### ***Some cross checks on the data***

I have tried to compare these results with other sources.

### ***Original income***

#### ***1937***

The earliest official material for UK income distribution is the 'Blue Book' series taking its name from the annual publication setting out breakdowns of the nation's income and expenditure. The series was based on Inland Revenue data – the irregular Survey of Personal Incomes which is the same source used by Barna for his top incomes. There had been several one off surveys done in the early part of the century but the regular official series began in 1949-50 and was discontinued in 1984/5. The Royal Commission on the Distribution of Income and Wealth (Cmnd 7595 1979) extended the official series back to 1938/9 and that report produced a Gini coefficient

for the distribution of *personal* income before tax for 1938/9 (see Table A.5) though the data refers to 1937/8.

The figure differs from ours for several reasons.

- First, it includes transfer income from government.
- It included estimates of non taxable and other income not included in the tax returns. So did Barna but the methods were different.
- There were missing returns in the 1938 data and all these missing units were assumed to be in the bottom income range. The number of income recipients in 1938 was taken to be the same as in 1949 and adjusted accordingly (para 2.26). Barna calculated the number of units from social surveys of the time.
- The Blue Book figures were based on the distribution between tax units which were not equivalised.

The Royal Commission produced a Gini coefficient from this survey for personal pre tax income in 1938/9 of 42.3%. The figure for original income we calculated from Barna's data was 37% for 1937.

Nicholson (1974) calculated a Gini from Barna's data for *original* income but left out the retired population on benefits. His Gini for that population using Barna's data is 33 (Nicholson 1974 p 81). That compares with ours for the whole population of 37. These comparisons alert us to show caution in interpreting any of these figures but, given the differences in approach our result does not appear outlandish.

A more technical issue arises in relation to giving upper *and* lower bound estimates for the Ginis. Since ours have been calculated from grouping the data they represent lower bound values only.

#### 1948/9

The base data Cartter used came from another special survey of personal incomes by the Inland Revenue and administrative data similar to that employed by Barna. We also equivalised it. The fall of 11 Gini points to greater equality between 1937 and 1948 is striking. It mirrors in reverse the rise of ten points that we see in the Thatcher years.

The fall in inequality in personal incomes in that period suggested by the Royal Commission was of six points, from a higher starting point. But because their personal incomes include poor relief and insurance benefits we would expect the fall to be greater comparing original incomes before and after the war. In 1937 there were one and a half million unemployed people. In 1948 there was effectively full employment. The unemployed in 1937 would have had virtually no original income. Poor relief and other benefits would have cushioned that situation somewhat.

The Royal Commission also limited the fall in inequality it could measure because of the assumptions it made. For example, it held the percentage shares of total national

income gained by households in the bottom three deciles constant before and after the war since they had no data on them. (See Cmnd 7595 1979, Table A.5). It was essentially trying to see what equalising effect was caused by the changes at the top it did have a good handle on. Barna and Cartter make estimates of incomes in these poorest groups in ways we have discussed. We would expect incomes to be higher at the bottom in 1948 because of the tight labour market at the time as well as the unemployment issue. So we would expect the Cartter data to show a higher fall in inequality than the Royal Commission.

Seers (1949; 1951) points to a considerable 'levelling of incomes' in the period from 1935 to 1947. His figures suggest a higher level of pre tax inequality than ours - a coefficient of 42 per cent for personal income in 1938 (not 37), for example. But this falls to 35 per cent in 1947 a fall of seven points. Again, this is for personal incomes including benefits. We would expect original income inequality to have fallen more for the reasons given already.

Lydall (1959) comes to similar conclusions about the 'levelling' that had taken place concluding that the big changes occurred in pre tax incomes rather than as a result of taxation.

These and other early studies suggesting equalisation were, of course, challenged by Titmuss (1962) on two major grounds.

- One was that rich households had found ways to move their incomes between family members and over time to avoid more tax and hence the Inland Revenue data understated the extent of inequality and may have done so more in the 1940s just because of the rise in direct tax rates at the top end of the income distribution (see below). This must remain a valid criticism. However, in a time series study the Titmuss case depends on miss-reporting or avoiding action being greater in the 1940s than the 1930s since some will have undoubtedly happened in the 1930s too. There is no way we can put a figure on that relative effect.
- The other objection was that the family composition of the tax units used by the Inland Revenue was changing and was not taken into account in the official series. In modern terms there was no equalisation. We have done this but the figures are as open to his first criticism as were these earlier studies.

More recent analysis of the Inland Revenue data for the highest income groups does suggest that the share of pre tax incomes enjoyed by the very highest groups did decline quite sharply in this period (Atkinson 2005). In 1937 the top 1% of pre tax incomes took 17% of all incomes. In 1949 the figure was 11.5%. The share taken by top 0.5% halved.

Weaver (1950) shows the importance of the changes in the incomes earned by the working class in the 1940s. He divided the income groups into three: the working class with incomes of lower than £500 in 1948; the middle class with £500 - £2,000 and the wealthy above that. He concluded that the working class had seen a real

increase in their per capita incomes ('share of consumption') of 22 per cent over 1938. The middle class a fall of 18 per cent and the wealthy a fall of 42 per cent. Most of the rise at the bottom had been the result of changes in employment and incomes while the top had lost because of rising tax rates. These may have been over estimates but the scale of the changes struck many contemporary observers as very large.

In short, our figures may show too great a trend to equalisation between 1937 and 1948 but there are grounds to believe that the direction of change and its significance are correct.

#### *1950s and 1960s*

Nicholson (1974), undertaking very much the same exercise as our own, concluded that by the 1960s the inequality in *original* incomes had returned to pretty much the same levels as in 1937 using Barna's data (p81).

Atkinson's (2005) survey of top incomes during this period suggests that there was a plateau in the 1950s, and on up to 1965, in the share of incomes enjoyed by the top one per cent of the income range. Then there was a further decline with a pause in the early 1970s.

Atkinson and Micklewright (1992) suggest a modest trend to higher inequality in *after tax incomes* including benefits between 1949 and 1964.

Abel-Smith and Townsend (1965) showed that the numbers in households on incomes below 140 per cent of the National Assistance level had increased from nearly 8 per cent in 1953/4 to just over 14 per cent in 1960.

The Royal Commission on Income Distribution (Cmnd 7595 1979), however, suggests growing equality in personal incomes before tax from 1948 to 1965.

These differences are difficult to resolve but it should be remembered again that the Royal Commission is dealing with personal incomes that include cash benefits while our and Nicholson's figures exclude benefits. The scale and coverage of cash benefits expanded greatly between 1948 and the 1960s.

The demographic changes that took place in the period, more elderly and more families with children and an increase in the birth rate would have reduced *equivalised* original incomes.

However, the scale of difference may well be simply an artefact of a too low figure for inequalities in original market incomes in 1948 which we have discussed already.

#### *1970s*

The figures for 1977 on are taken from the ONS reworking of their data on an equivalised basis that is consistent with their current methods. We cannot take our or Nicholson's figures for original incomes as equivalent to theirs. The data sources are

different, as are the methods of calculating the Gini coefficient since they have individual household data.

The figures for 1977 on are founded on a common methodology and data sources that are described in the latest ONS study (Jones 2006). The robustness of these surveys has clearly improved a great deal since the early years – the size of the sample and the coverage of both ends of the distribution have contributed to this. However, it remains the case that the treatment of benefits in kind remains fairly crude. Each individual in a household is allocated a given sum for the value of health care, for example, which is roughly speaking the average for the whole population of that age and gender. In the case of education the sum differs for the level of schooling – primary or secondary. Higher education costs are allocated to an individual student not his or her parents.

The crudity of this allocation process thus fails to measure the attempts of government to target such spending on poor areas and on poorer households. In the past few years this type of government policy has grown in importance. Primary Health Care Trusts now have target allocations that vary considerably according to indicators of poor health in their populations. The least favoured demographically and socially can get 40 per cent more resources than a more favoured area (DoH 2005; Glennerster 2007). The same is true of allocations for school spending. These variations are not taken into account in the way the ‘final income’ measures are calculated and hence underestimate the redistributive effect of in kind services.

This approach is understandable given the methodological problems involved in trying to represent the impact of such local differences in national data sets. However, a colleague, Tom Sefton (1997; 2002) has sought to do just that. He shows that social services in kind, like school education, health, social care and housing, are significantly pro poor. The age composition of households which the ONS does capture is the most important factor in the pro poor nature of in kind spending but other policies can have an impact too, as we have seen such as attempts to target areas for health spending where there are more people with long standing illnesses or to spend more on poor housing areas. The ratio of benefits in kind received by the bottom and top quintile groups was 1.7. The poorer households received one and three quarter times as much benefit from services in kind compared to the richer fifth. That reduced to 1.2 times when the demographic effects are taken out.

Sefton (2002) suggested that the changes in the nature and scale of the social wage had benefited those in the lower income groups more than the higher ones since 1997. Those in the poorest 40 per cent of households had benefited by 4-5% while the other households had gained by 1 per cent. His figures only cover the period 1997-2001 and the major growth in spending on health and education has come later.

The ONS figures do show benefits in kind reducing inequality by about seven points in 1997- a little more than in 1987. However, they show no greater equalising effect since 1997 and this may be an underestimate based on Sefton’s figures.

## 8. Some compositional changes over time

We should thus be careful about putting too much weight on any of the year by year figures before 1977 and comparisons with modern data but some compositional trends are worth noting and are likely to be more robust.

- They suggest that the impact of tax and benefit policy since the war has been fairly consistent. It has reduced the extent of inequality in original incomes by something over 40 per cent ever since 1948 (see Table 3 and ignoring the years where we only have figures for the non retired population).

**Table 3: The reduction in inequality produced by different types of taxes and benefits 1937 – 2005 measured in Gini points expressed as percentages**

Year	Reduction in Gini from cash benefits	Reduction from direct taxes	Impact of indirect taxes +	Reduction from benefits in kind	Overall reduction	
					Absolute	Percent
1937	4	4	-	1	9	24
1948	5	5	-	2	12	46
1961/2*	(6)	(2)			(7)	(22)
1969*	(8)	(2)			(8)	(24)
1977	13	3	+2	6	20	46
1987	15	3	+3	6	21	41
1997/8	16	3	+4	7	22	42
2004/5	15	4	+4	7	22	43

\*Non retired households and non equivalised

+ A minus sign represents an increase in inequality

- The reduction in inequality that resulted from direct taxation was greater in 1948 than in any other period as we might expect given the very high marginal tax rates of the time. However, given that the levelling effect was not as great as might have been expected. There are serious limits to the impact of very high levels of tax at the top end.
- Indirect taxes become much more important in undoing the equalising effects of cash benefits in later periods.
- Cash benefits become a much more powerful mechanism for redistribution in later years for reasons of social structure and employment status. The population ages, unemployment and long term sickness grow and single parenthood becomes more common.

- The immediate post war period *was* much more egalitarian than the 1930s though most of this can be explained by the higher levels of employment and wages.
- Above all taxation and welfare benefits are reducing the scale of inequality in absolute terms today by something like twice the amount they were in the 1930s and by nearly twice the absolute amount they were under the Attlee Government. This is despite the fact that the resulting distribution of income is now wider than it was then. The welfare state is having to work much harder merely to ensure that inequality stands still, let alone falls, compared to the past. This is the result of the much higher levels of income inequality that has arisen in the labour market.

## **9. Tax and benefit policy changes**

### ***Pre-war - 1937***

In the pre war period the scale of taxation needed to finance the welfare state was much lower than today. In 1937 the amount spent on social policy was about nine per cent of GDP compared to over twenty five per cent today. However, that spending was much more directly targeted on the poor than now. It was only elementary education that was free. Secondary education involved fees which were remitted for poor 'scholarship children'. Hospitals charged fees which were again remitted for the poor or workers had hospital insurance. The health insurance scheme covered only the below average paid worker. Other social services such as the care of the elderly were only available free under the Poor Law. National Insurance pensions were also concentrated on those with lower incomes.

Table 4 sets out the breakdown of spending Barna and his modern equivalents allocate between the households who benefit. It also shows the total of all public spending which includes that which could not be allocated. There is considerable similarity.

**Table 4: Public expenditure in 1937 and 2004**

Allocated expenditure	1937		2004/5	
	£m	%	£m	%
Education (plus meals and student support)	124	20	59,960	22
Public health	58	9	} 77,780	29
Health insurance	47	7		
Public assistance indoor relief	17	2	} 68,590	25
Unemployment and poverty (excluding indoor relief)	119	19		
Pensions	139	22	48,400	18
Housing	22	3	13,380	5
Road traffic/travel subsidies	77	12	1,940	1
Other	36	6	-	
<b>Total allocated expenditure</b>	<b>639</b>	<b>100</b>	<b>270,050</b>	<b>100</b>
<b>Total public expenditure</b>	<b>1,103</b>		<b>492,410</b>	
Allocated expenditure as a percentage of total general public expenditure	58		55	

**Source:** Barna (1945) Table 58 p 217 and Jones (2006) Appendix 1

### ***Taxation***

Taxes were also very different. Total taxes amounted to only 25 per cent of total national income not the forty per cent they do today. Far fewer people were affected by income taxes. 22 million individuals were in households that did not come within the income tax range. After tax allowances were taken into account only about four million households actually paid income tax. Today those in the bottom decile are recorded as paying some income tax in the *Economic Trends* survey.

Once above the tax threshold the lowest income earners paid a reduced rate of tax - 1s 8d in the pound (8.3%). The standard rate equivalent was 25%. A 'Surtax' was paid by the higher income groups on top of income tax. It began at 5.5% for those earning a taxable income of over £2,000. It rose to a marginal rate of 41% at the top - £50,000 a year or more. That amounted to a total tax take at the top of 66%.

That did not mean that lower income groups paid no direct tax. They did but it was called a social insurance contribution. This form of revenue fell almost entirely on those earning less than £250 a year.

The taxes on alcohol and tobacco fell very largely on the lowest income groups. Roughly 80% of those taxes fell on those earning less than £250 a year and half of that on those earning less than £125 a year. Food also carried a tax. Alcohol and tobacco,

despite their known harmful effects on health, are now taxed much less heavily than pre war.

We have a much wider range of indirect taxes including some directed at changing other kinds of behaviour like the climate change levy and landfill tax, congestion charge or the airports levy but they are tiny in revenue terms.

Local taxation in the form of a property tax- the rates or the equivalent to our council tax – constituted a much higher proportion of total revenue. The near 12 per cent of all taxes that went to local government included rates on business property. That compares to the domestic council tax which local councils can levy today which makes up only 4 per cent of all national revenue.

Death duties were much more important compared to our inheritance tax. In 1937 they constituted over seven per cent of all revenue. Today the figure is only 0.6 per cent. The National Defence Contribution was to fund the rearmament programme and was a tax on profits.

**Table 5: Taxation 1937 to 2004/5 (Share of total revenue - %)**

	1937	1948	1964	1990	2004/5
Income tax and surtax (personal)	24.7	31.8	32.1	27.4	26.9
Income tax non-personal/corporate taxes	6.4	6.8	4.2	10.6	9.7
Death duties	7.3	4.4	3.2	0.6	0.6
Stamp duties	1.5	1.4	0.8	0.8	0.2
Social insurance contributions*	5.1	8.0	14.8	17.2	15.1
National Defence contributions	1.5	-	-	-	-
<i>Total direct taxation</i>	<i>46.5</i>	<i>51.0</i>	<i>55.1</i>	<i>56.6</i>	<i>52.5</i>
Rates (property tax/council tax including business rates)	11.7	7.6	11.3	5.1	7.5
Food	4.5	-	-	-	-
Alcohol and tobacco	17.1	24.5	15.4	5.2	3.1
Private motoring/fuel duty, vehicle duty	3.1	2.5	8.6	6.4	5.4
Purchase tax/VAT	-	7.2	6.5	15.2	16.12
Other	17.1	7.2	3.1	12.0	15.4
<i>Total indirect taxation</i>	<i>53.5</i>	<i>49.0</i>	<i>44.9</i>	<i>43.4</i>	<i>47.5</i>
<b>Total all taxes</b>	<b>100.0</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100.0</b>

\* These include both employer and employee contributions

Source: Barna 1945; Glennerster 1992; Treasury (2006)

### ***Post war from 1948***

The post-war welfare state extended health cover to the whole population and drew the whole population into the new National Insurance scheme. It made all state schooling free. The major beneficiaries were, of course, the middle class, as Brian Abel-Smith (1958) pointed out. The working class had been the beneficiaries of the old panel doctor system and the means tested hospital fees arrangements and to a lesser extent the scholarships to grammar schools. However, women and working men's dependents did benefit from the 1945-8 changes. This issue is discussed more fully in Glennerster (2007).

Thus, whether the new welfare state would favour the working class or make them worse off depended crucially on the tax structure. There was an increase in the share of direct taxes in total revenue but also an increase in the take of some taxes that bore heavily on the working class. Alcohol and tobacco taxes were even larger than pre-war. Purchase tax on the other hand was applied to 'luxury goods', the more luxurious in government's judgement, the higher the tax rate. Purchase tax was levied on sales of 'non-essential' items at three rates: 33.3%, 66.6% and 100%.

The combined effect was to neutralise the impact of indirect tax on income distribution.

The expanded post war National Insurance scheme was funded by what was effectively a poll tax – flat rate contributions paid by employees and their employers. We have seen that employer contributions act like a direct tax when passed on in prices. Thus despite the scale of 'direct taxation' much of it was not progressive in impact. Some was.

The Second World War had sharply expanded the range of incomes covered by income tax and had raised the top marginal rates. The tax relief limits had risen very little despite rises in incomes. So tax bit lower down the income range. Rates of tax were also much higher than pre war. They were reduced compared to rates applied during the war but had not been lowered to the levels of 1937. The lower rates on incomes below £250 meant there were effectively three rates at the bottom – 15%, 30% and the standard rate for most was 45%. That compared to 25% in 1937/8.

On top was the surtax rate beginning at £2,000. That meant an additional tax of 10% on the range £2,000 to £2,500. This rose in stages to a top rate of 10s 6p which meant the top marginal rate of tax including the basic rate was 97.5%! In 1937 it had been a mere 86%! This meant there was an effective ceiling on declared or unhidden incomes set at £50,000. How much was evaded and income rearranged to avoid it is another matter, as Titmuss (1962) pointed out.

Professor Little (1952) calculated that a single man earning £20,000 in 1938/9 would have taken home £10,000 but only £4,300 in 1949/50. It was little different if he was married and had three children.

Partly because original incomes were much more equal in 1948, partly because the numbers caught by the high tax rate were low, and partly because not all direct taxes were progressive, direct taxes made only a one Gini point greater contribution to reducing inequality in 1948 than they did in 1937.

1948 also saw a one off capital levy (Special Contribution) which took away a slice of people's investment income – 10% of investment income between £250-500 and 50% of those with the highest incomes. Death duties were levied on estates of over £2,000. This tax rate rose from 1.2% at that level and to 64% for the largest estates.

Little (1952) concluded:

‘The limits of the power of fiscal policy to reduce, in the short period, the consumption of the rich may have been reached or surpassed’. (p85)

So it was to prove.

Overall the tax benefit regime in 1948 did reduce inequality more than in 1937 but the big change had been in the greater equality in the pattern of rewards in the labour market. Work, not benefits, had made the most difference.

### ***1950s and 1960s***

Attempts were made by the Conservative administrations in the 1950s to slow the increase in state spending on social welfare. By the end of the 1950s this attempt was in full retreat. The share of the GDP spent on social policy increased from 11 per cent in 1951 to 15 per cent in the mid 1960s. Much of this increase went in coping with the rising school and ageing population but many benefits (not family allowances), began to be raised in line with living standards.

Between 1951 and 1964 there were reductions in the high marginal rates of tax that had come with the Second World War. Social security contributions were increased in importance quite sharply – from eight per cent of all revenue in 1948 to 15 per cent in 1964. Death duties and stamp duties began their decline.

If we take a married couple with two children under 11 in 1955/6 and compare them to the situation in 1963/4 the combined effect of changes to tax and insurance contributions was to increase the contributions of those earning below £700 year and to reduce the tax burden tax on those above that level. For those earning £5,000 a year in such a family the tax reduction was equivalent to 17 per cent of their income.

### ***1970s to the present***

The big increase in inequality since about 1977 has been widely discussed and reasons for it analysed in some detail (Hills 1996: 2004) and will not be repeated here.

Clarke and Leicester (2004) undertook a full modelling exercise on the impact of tax and cash benefit policy from 1979 to 2001. Their conclusions depend on what the counterfactual state of the world is taken to be. But, if we assume that there had been a

clear policy rule prior up to 1981 that benefits *should* rise in line with the wider earnings in society, their conclusions are clear.

‘.. approximately half the total rise in income inequality is explained by the tax and benefit reforms.’ (p 129)

Much of this result was caused by the failure to keep benefits rising in line with other incomes after 1981. The big shift to indirect taxation (the doubling of the revenue share contributed by VAT) and reductions in direct tax rates contributed further to the income widening effect of tax and benefit policy in the early 1980s. The increases in taxation in the Major period, 1991-7, undertaken for macro economic reasons, were more equalising (see Table 1.)

The reduction in inequality that has occurred since 2001/2, taking all kinds of tax and benefits into account, amounts to four Gini points. Of that about half is the result of a reduction in original market income of about two points. More cash benefits targeted on children and the poor pensioner have reduced the inequality score since 2001/2 by an extra one point. The other point is the result of direct taxation- mainly the impact of fiscal drag bringing more people into the top tax bracket and changes to tax relief, like that on mortgages, which was phased out. However, more cash benefits to the poor elderly and children have been balanced by less to others who have no children (Hills and Stewart 2005).

## **10. Comparisons with other countries**

No other country has the long tradition of doing Barna type analyses as the UK.

Conrad (1954) did try to emulate Barna for the US as Cartter had done. He concluded that the Gini coefficient of concentration in the US in 1950 was 45 and it was reduced to 41 by the receipt of benefits and to 35 for final incomes. That was less than Cartter had observed for the UK in 1948.

The Luxemburg Income Study (LIS) does provide information on the distribution of income before and after taxation and cash benefits for a wide range of countries and does so for years that date back to the 1970s in some cases. They do not regularly cover benefits in kind. O’Higgins and Ruggles (1981) and Ruggles and O’Higgins (1981) did apply the *Economic Trends* methods to the US and UK. Smeeding et al (1993) did so for seven countries going back to the 1980s. They concluded that:

‘Our results do not give rise to a pattern of national differences in poverty rates or income inequality markedly different from previous LIS research based on cash income alone’. (p229)

They did not however, attempt to produce a summary measure of the overall impact using a Gini coefficient or similar measure. They also excluded a range of expenditure that was potentially highly redistributive such as the long term care of the elderly and younger people with disabilities. Nor did they attempt to deal with further and higher

education or with variations in spending across the states of the United States for example.

The results suggest Swedish services in kind had little or no effect on the distribution of final income there with services in West Germany having the biggest impact. The Swedish effect followed from the universal nature of their services. The UK outcomes showed little redistributive effect except at the top end resulting from the fact that the rich opted out of services like education. The redistributive impact in the US was greater with smaller expenditure than Europe. The analysis did not go into the kind of detail found in Sefton's work which suggests the impact of services in kind on inequality is probably much bigger than they suggest.

Smeeding (2004) compared the reduction in inequality resulting from cash and near cash benefits and taxation again using the Luxembourg Income study. The proportionate reduction in the scale of inequality for the UK achieved by social policy is much lower than that shown in the ONS or our figures.

One has to conclude that there is much more work to do here. It would need a major collaborative research exercise and household studies of in kind benefit receipt in each country.

## **11. Some broad conclusions**

### ***On the figures***

It should be emphasised once again that the pre 1977 figures are not part of a proper series since they are derived from administrative and tax returns with a large number of assumptions built in at each stage in the build up of the figures. However, we have compared them with other sources and cautioned where problems may arise.

Some general points emerge.

- The really big changes in the final distribution of income since 1937 have been driven by changes in the original distribution of labour market incomes despite the growing scale of the welfare state. This was true of the equalising of incomes between the 1930s and 1948. The coming of full employment and the increased rewards to manual labour which was in such demand after the war made the big impact. So, too, perhaps, did the effect of the war on notions of fairness and what an acceptable gap in the reward for labour was.
- In comparison the impact of the new post war tax and benefit policy of the welfare state was much less powerful. The second big shift in income distribution we can be sure of was in the reverse direction during the Thatcher era. Here, once again, a large effect was in the change in the rewards of work and the extent of work that was available. This time tax and benefit policy made inequality greater than it would have been in the absence of any social policy changes. Direct taxes lost some of their effectiveness in equalising

incomes since the 1940s and have only increased their redistributive impact somewhat since 1997.

- Indirect taxes have had a growing part to play in counteracting the equalising effect of direct taxation since they fall most heavily on the poor.
- Cash benefits have taken on a growing role in countering inequality as the scale of unemployment, old age, long term sickness and single parenthood has increased.
- The scale of the welfare state's redistributive role did grow substantially from 1937 to 1948. Since then it has probably reduced the scale of inequality quite consistently by over 40 per cent.
- In *absolute* terms the modern welfare state is reducing the scale of inequality by considerably *more* than it was in 1948. That this has not led to a more equal society than in 1948 is a consequence of the profound changes in the labour market and in demographic patterns which have widened the inequality of market incomes to such a large extent. Tax and benefit policy is having to work much harder merely to stand still in terms of redistribution.

### ***On the methodology***

The annual *Economic Trends* article should include an overall assessment of the equalising impact of taxes and benefits in kind as well as in cash. In the short term this could be achieved by publishing figures similar to those in this paper, with caveats. In the longer term the equilibration methodology needs to be re-considered.

There is a case for more comparative work on the relative impact of in kind benefits on inequality in different countries.

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