Poverty Dynamics in Great Britain: Preliminary Analysis from the British Household Panel Survey

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1. The Limitations of Existing Data Sources

Most statistics about the UK income distribution are based on annual household surveys such as the Family Expenditure Survey (FES). These include the annual DSS "Households Below Average Income" series and an IFS study of trends in the income distribution over the past thirty years (Goodman and Webb, 1994). The FES has been carried out each year since 1957 and currently provides detailed information on the incomes, expenditures and other characteristics of around 7000 households.

However, a major limitation of using the FES for this purpose is that each year the information provided is for a different 7000 households. To borrow an analogy from the authors of the report on the British Household Panel Survey (BHPS) (Buck et al. 1994) surveys like the FES supply us with single pages from a large number of family photo albums. What would also be interesting would be to have complete photo albums for a set of families. This is what panel surveys, such as the BHPS aim to provide.

In the context of income distribution analysis, the potential value of a panel is in analysing issues such as transitions into and out of poverty, or in answering questions such as "Have the poor got poorer?". Thus at present, the official "Households Below Average Income" statistics (eg DSS, 1994) provide figures for the incomes of the poorest households in 1979 and in 1991/92. A comparison of, for example, the income (after housing costs) at the 5th percentile in each year shows a real terms fall of 17%. From this it is frequently concluded that the poor have indeed "got poorer". But all these statistics actually tell us is that the poor in 1991/92 were typically poorer than the poor in 1979, not that the people at the bottom in 1979 have themselves got worse off. Indeed, on the basis of repeated cross-section analysis we have no way of confirming or refuting the claim.

Ideally then, a panel survey such as the BHPS should enable us to overcome this problem by tracking individuals over a number of years and seeing what has happened to those who might have been considered "poor" at the start of the period. One aim of this paper is therefore to assess how far the panel data contained in surveys such as the BHPS provides a different perspective on the living standards of individuals at different points in the income distribution compared with the results suggested by use of repeated cross-section data.

Before proceeding to compare the two approaches however, a prior task must be undertaken. This is to offer a preliminary assessment of whether the BHPS data is reliable enough to provide the basis for this sort of analysis. The BHPS is not solely, or even primarily concerned with collecting data for the analysis of trends in the income distribution. It is concerned with all aspects of "micro-social change" including employment, family formation and dissolution, housing, health, the management of household finances and political beliefs. In a chapter of the BHPS report (Taylor et al., 1994 in Buck et al. op. cit.), the authors candidly acknowledge:

> "Since BHPS, as a multi-purpose survey, can devote far less time [than FES] to income data collection, it is important to ensure that the data collected are not subject to any major systematic biases, in order to have confidence that panel results may be relied on" (p86).

A prior task of the paper is therefore to assess whether the cross-section of income data contained in the BHPS provides a suitable basis on which to make inferences about changes in living standards over time. This builds on the work of Taylor et al. cited above.

The remainder of the paper is structured as follows: Section 2 briefly describes the BHPS including details of fieldwork, subjects covered etc. whilst Section 3 gives more details about the quality of the income data. Section 4 presents some comparisons of BHPS and FES data, particularly when each is used to construct "Households Below Average Income" type statistics. Section 5 considers how using the two waves of the BHPS as a panel rather than as a repeated cross-section provides a different perspective on trends in low income. Concluding remarks are offered in Section 6 and some technical matters are dealt with in an Appendix.

2. About the BHPS

The Structure of the Panel

Fieldwork for the first wave of The British Household Panel Survey was undertaken over the period September to December 1991. The intention is to follow up Wave One respondents on an annual basis for at least ten years. As well as re-interviewing "Original Sample Members" (OSMs), the BHPS will also track OSMs as they form new households and will interview members of those households as long as they contain an OSM. The Survey will also interview and track the children of OSMs as they reach the age of sixteen. Micro-data for Waves One and Two are currently (April 1995) in the public domain, with data for Wave Three shortly to be made available to external analysts.

Subject Matter

BHPS sample members are asked questions on six broad topics as set out below:

Household Organisation

This section covers basic demographic details plus intra-household information on topics such as the division of labour, the organisation of household finances and access to consumption goods within the household.

Labour Market

Each wave of the panel collects detailed information about the job history of each individual over the preceding twelve months and about spells outside the labour market. For each spell in the labour market, information is collected about the nature of the employer, pay levels etc. plus more detailed information in areas such as training, job security and promotions. In addition to this annually collected information, Wave Two contains special questions designed to collect summary lifetime employment histories for responding adults.

Housing

This section covers basic information about housing costs and housing condition, as well as attitudes to local neighbourhoods and intentions to move home.

Income and Wealth

Individuals are asked to supply details of their income from employment, self-employment, social security benefits and certain other sources. In particular, respondents are asked to indicate whether they received social security benefits in each of the preceding twelve months, which can be used to study the flow in and out of benefit receipt. In the early waves BHPS has not attempted to collect detailed information on wealth or investment income on the grounds that this might increase non-response in the crucial early years of the panel.

Health

Topics covered include use of health services and subjective feelings of well-being.

Socio-Economic Values

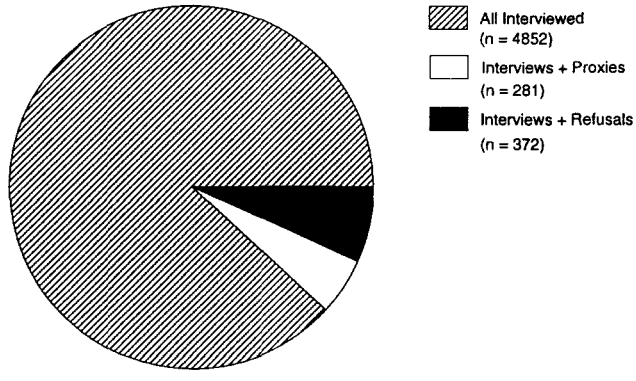
Data is collected on values and beliefs including family and political values, and the extent and nature of social participation.

A set of core questions is asked on these areas each year, with individual waves containing more detailed questions on selected topics. Thus a particular focus of Wave Two is on marital histories and on natural children who are not members of the respondent's household.

Fieldwork, Response Rates etc.

From a representative sample of 7,491 households in Great Britain in 1991, an interview was obtained from at least one member of 5,511 of these households, implying a response rate of 73.4%. Excluding six of these households where only minimal household level information was gathered, Figure 1 provides more details of the response by these households.

Figure 1.
Household Respondents to Wave One



As Figure 1 indicates, not all of the 5,505 households would have been included in the dataset for a survey such as FES which would not generally accept proxy responses and would reject entire households where any household member refused to participate. On this basis, the BHPS Wave One response rate was 4,852 out of 7,491 or 64.8%. This compares with a response rate of around 69% for the 1991 FES.

When dealing with panel data however, the concept of a household becomes far less central than with cross-section surveys. This is because as Original Sample Members are tracked over time the structure of their household often changes, whether because new members join (eg births, marriages), existing members leave

(eg death, children leaving home) or because they themselves leave their previous household to form a new one (eg divorce). It is therefore also instructive to examine response rate at the individual level, and a summary of response to Waves One to Three is presented in Table 1.

Table 1.
Individual Response Rates Waves One to Three

	Wave 1 Respondents	New Respondents	Wave 2 Respondents	New Respondents	Wave 3 Respondents
Wave 1	**9,912**				
Died / Out of scope	-139				
Eligible at Wave 2	9,773				
Wave 2	8,567	+892	**9,459**		
Died / Out of scope	-121		-336		
Eligible at Wave 3	8,446		9,123		
Wave 3	7,617		8,205	+812	**9,017**

Source: BHPS News, Issue Number 8, Autumn 1994

Table 1 provides some indication of the extent to which, following the initial non-response to the survey, there was attrition amongst Original Sample Members. In all there were 9,912 individual adult respondents to the first wave of the survey. Of these 139 had either died or moved out of the scope of the survey (eg abroad, into residential care etc.) by the time fieldwork for the second wave was undertaken. This left 9,773 OSMs of whom about 12% did not respond to the second wave. The remaining 8,567 were supplemented by a further 892 respondents who were new adult members of the households of OSMs, and this produced a total of 9,459 adult respondents to wave 2.

Between waves 2 and 3, a further 10% of those eligible to be interviewed failed to respond, and this, coupled with a further 336 deaths / movements out of scope, more than offset the addition of 812 new respondents. As a result, the total number of respondents in Wave 3 stood at 9,017 compared with the 9,912 who responded to Wave 1. Of the 9,017 who responded to Wave 3, 7,617 were Original Sample Members who had responded (almost without exception) to each of the three waves.

Correcting for non-response

If the combination of initial non-response and subsequent panel attrition described in the previous section was left uncorrected, it is highly likely that the BHPS sample would become increasingly unrepresentative of the population as a whole.

In order to minimise this problem, the BHPS is supplied with a set of weights which can be used to adjust the raw data to reflect known patterns of non-response.[1] The weights are of two kinds:

a) cross-section weights:

> if a given wave of the survey is to be used for cross-section analysis it is necessary to correct for non-randomness arising both from sample design (typically very small) and non-response. The adjustments for non-response on Wave One take account where possible of any information which can be gleaned about the characteristics of non-responding households (eg region, type of dwelling) and non-responding individuals. Separate weights are available for household level analysis, for analysis of all enumerated individuals (ie including proxies / refusals and children) and for respondent adults only.

b) longitudinal weights:

> where individuals are to be tracked over time, unrepresentativeness could arise if the individuals who drop out of the survey are a non-random subsample of the original respondents. Separate individual level weights are therefore available for longitudinal analysis which attempt to correct for variations in attrition rates among individuals in different groups classified by age / sex / housing tenure etc.

Both cross-section and longitudinal weights are truncated to avoid high weights being applied to particular households or individuals. If all weights are normalised at 1.0, Wave One cross-section weights for individual respondents range between 0.2 and 2.5, whilst longitudinal respondent weights range between 0.21 and 3.15.

In the analysis in Section 4, all cross-sectional results for BHPS are based on enumerated individuals (ie including children) and are reweighted according to the appropriate cross-section weights.

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1 For a more detailed discussion of the derivation of BHPS weights, see Taylor, M.F. (1994, Volume A, A-35 to A-44)

3. The Quality of the Income Data in the BHPS

In some respects the income data in the BHPS is greatly superior to that contained in a cross-section survey. This is because even in a single wave it seeks to collect information on social security income in each of the preceding twelve months, and on earnings not just from current employment / self-employment but from previous jobs, also over the preceding year. However, there are two main limitations which must be considered when using BHPS income data for respondent households - the significant amount of missing data and the limited information on investment income. We consider each in turn.

Missing Values

When Wave One of the BHPS was released, it contained a significant number of missing values in response to questions about income. This typically arose from respondents not knowing how much income they had from a particular source or from refusal to divulge the relevant information. When Wave Two was released, a second version of Wave One was released containing *imputed* values for most missing items of income information. It is understood that when Wave Three is released, a revised version of Waves One and Two containing new imputed values will also be released.

An indication of the extent of the problem is given in Table 2, which shows the number of Wave One households whose monthly income figure was wholly or partly imputed, cross-classified against the response status of the household.

Table 2. Income Imputation and Household Response Status in Wave One

Whether HH Monthly Income Imputed:	All Members Interviewed	Mix of Ints. and Proxies	Mix of Ints. and Refusals	Limited HH data only[a]	Total
Not Imputed	3,519	162	1	6	3,688
Partially Imputed	1,328	48	1	0	1,377
Wholly Imputed	5	71	370	0	446
All Households	4,852	281	372	6	5,511

[a] No imputation at all was attempted for these six households
Source: Author's tabulations of BHPS micro-data.

Table 2 indicates that of 5,505 households where at least one adult member gave a "full" interview (ie excluding the 6 with only limited household level information), only 3,682 provided enough income information to avoid the need for any imputation, whilst for 446 all non-zero components of household income had to be imputed. Table 3 shows the extent to which different sources of income had to be imputed.

Table 3.
Proportion of Households with Different Sources of Income Imputed (Wave One)

Income Source	Non-Zero Values: Some Imputation	All Non-Zeros (= 100%) Number of Households
Earnings / Self-Employment	26%	3750
Private Pensions	16%	1261
Social Security	23%	3939
Transfers	24%	366
Investment Income	18%	3794
TOTAL INCOME	33%	5497

Note: "Transfer" income includes maintenance / alimony and payments from other family members not in household, as well as income from private insurance benefits.

Table 3 shows that imputation is not peculiar to one particular source of income but has been necessary for all sources of income. Around one quarter of all non-zero values for earnings, social security and transfers have been at least partially imputed, and around one sixth of non-zero values for private pension income have been imputed. A similar proportion of values for investment income have also been imputed, though as noted below, this simply involves estimating in which of a small number of wide bands total investment income fell.

The extent of imputation of all sources of income suggests that the method of imputation will be of critical importance for the quality of the income data in the survey. The procedures adopted in the data used here are described in the Technical Appendix.

Clearly imputation on this scale is far from ideal and is partly a consequence of devoting less time to collecting income information than other household surveys. In defence of BHPS it should be observed that the organisers of the survey have been extremely open about the extent and nature of the imputation used and have indicated in the public-release data where variables have been imputed. This is in marked contrast to certain other household surveys where there is very little information on the extent to which the data finally released has been subject to imputation and where there is little information on the characteristics of non-responding households.

Given the extent of imputation of income variables it becomes doubly important that the data is extensively validated before it is used to draw conclusions about trends in the income distribution. Some work on this has already been undertaken, notably in Taylor et al. (cited above) which compares BHPS and FES income data and finds considerable similarity in terms of population mean income and share of household income by income source. Much more work needs to be done

in this area however, and in particular the BHPS income data should be extensively checked against published aggregate statistics for earnings, benefit receipt and housing costs.

Investment Income

Questions about investments and financial assets are often regarded by survey respondents as particularly intrusive. For this reason, in the Family Expenditure Survey questions on assets are asked at the end of the interview and this is the only area where a respondent refusal does not result in the whole household being deleted from the sample.

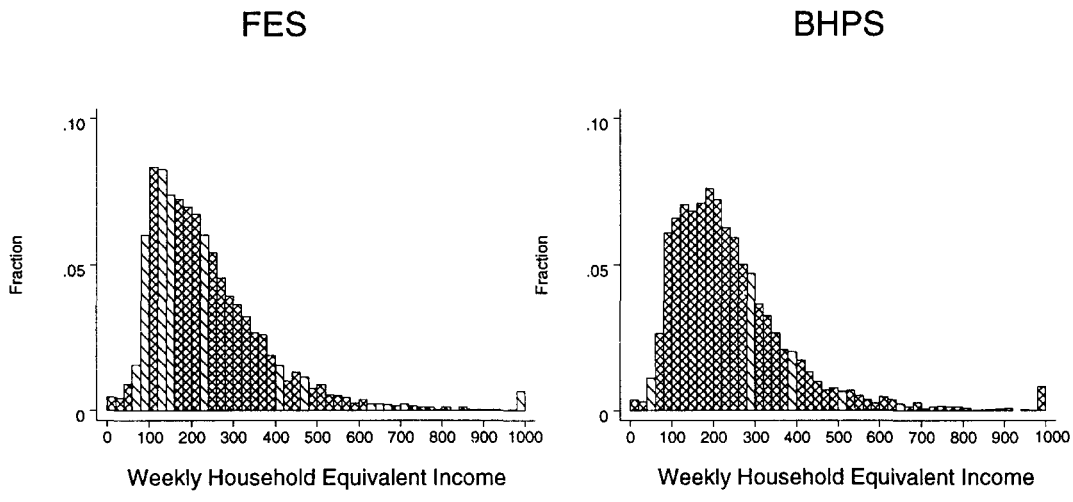
For similar reasons, the early waves of the BHPS collect relatively little information about wealth and about investment income. The principal question about income from dividends and interest allows respondents to indicate whether their annual income from this source is nil, falls between £1 and £100, between £100 and £1000, or over £1000. For the purpose of accumulating a figure for total household income, these three non-zero responses are taken to represent income of £60, £600, and £1,800 respectively. Whilst investment income is, on average, a relatively minor part of total household income (around 7% according to the 1991 FES) this banding is regrettable and will understate the highest incomes from this source quite considerably.

4. Comparisons with Family Expenditure Survey data

Having identified some of the main features of the BHPS and some of the limitations of the data it contains, we next compare the cross-section results from Wave One, with those from the FES of 1991. Clearly the FES is itself subject to problems of non-response etc. and does not in any sense give the "correct" answer. However this comparison will enable us to assess whether the BHPS produces similar cross-section results to the data source currently most widely used in income distribution analysis.

To begin with, Figure 2 shows frequency distributions for weekly household equivalent income based on FES 1991 and BHPS Wave One[2]. For the purposes of this Figure only, the distributions have been truncated at £1000 pw, with all values in excess of this point being reset to £1000.

Figure 2.
Distribution of Household Equivalent Income in FES 1991 and BHPS Wave One



Clearly the distribution of income in the two surveys is quite different. In particular, there is considerable concentration in the FES around the modal income range of £100-£140 in the FES sample, whereas in the BHPS there is more dispersion around a range of income from £120-£220 pw. This pattern is reflected in Table 4 which shows selected quantile points on the two distributions. The 1991 FES distribution is more compressed than the BHPS at lower income levels but has a greater spread in the top half of the distribution.

2 A more detailed description of the definitions and samples used appears in the Technical Appendix.

Table 4.
Household equivalent income in BHPS Wave One and FES 1991: Selected Quantiles

(£ pw, Jan. 1991 prices)	BHPS Wave One	FES 1991
10th Percentile	99.45	101.21
25th Percentile	143.18	137.34
50th Percentile	212.48	206.89
75th Percentile	301.03	302.79
90th Percentile	414.34	417.99

Table 5, which shows the composition of total household income by source, shows however that mean income in the two surveys is very similar[3].

Table 5.
Household equivalent income in BHPS Wave One and FES 1991: By Income Source

(£ pw, Jan. 1991 prices)	BHPS Wave One	FES 1991
Employment	151.68	149.27
Self-Employment	32.84	23.90
Private Pensions	12.15	12.16
Social Security	36.36	39.08
Transfers	2.85	4.77
Investments	10.95	15.81
Total	246.81	244.99

The aggregate figures for weekly household equivalent income are strikingly similar in the two surveys, but this similar total conceals some significant variations between different sources of income. First, income from self-employment is markedly higher in the BHPS. In part this may reflect the fact that for HBAI purposes FES cases who have been self-employed for only one month are eliminated from the sample. This group often gives high and, it is believed, unreliable profit figures. On the other hand, the top self-employment profits in

3 The results for social security in the BHPS have been adjusted slightly to take account of problems with Housing Benefit data. This issue is discussed more fully in the Technical Appendix.

Wave One of the BHPS generally come from those with twelve months of accounts data, so this can only be part of the explanation for the difference between the two surveys.

Data on employment and private pension income are very similar between the two surveys, whilst FES reports higher mean values for social security benefits, miscellaneous transfers and, in particular, investment income. This latter result probably reflects the greater effort expended in FES on extracting information on this topic.

Table 6 presents more detailed results by income source, providing means and medians for households with non-zero values only.

Table 6
Household equivalent income in BHPS Wave One and FES 1991: By Income Source (Non-Zeros Only)

(£ pw, Jan. 1991 prices)	BHPS Wave One			FES 1991		
	Mean	Median	% NZ	Mean	Median	% NZ
Employment	204.91	186.00	74%	208.78	185.30	72%
Self-Employment	220.55	146.87	15%	102.33	21.17	24%
Private Pensions	65.49	39.82	19%	62.57	36.70	19%
Social Security	47.21	27.99	77%	51.20	36.29	76%
Transfers	36.28	23.11	8%	20.26	2.04	24%
Investments	15.61	8.62	70%	21.76	2.74	73%

Note: The "% non-zero" figure is defined as the percentage of individuals in households with income from the specified source. It does not imply that all members of the household have income from that source.

In terms of the number of individuals in households reporting non-zero receipt of each income source, the most striking discrepancies are for self-employment and for transfers. Almost one in four individuals in the FES is in a household with some self-employment income compared with fewer than one in six in the BHPS. Analysis of the median values shows that the vast majority of these FES amounts are very small, with just under half being below the £20 mark. This discrepancy suggests either that FES and BHPS are drawing the line between employment and self-employment in different places, or that BHPS is simply failing to pick up these small amounts of income. It seems likely that both effects are at work.

A similar difference occurs for the residual category of "transfers", where FES has three times as many non-zeros, but a much smaller median receipt. Again it seems likely that the more detailed income questions contained in FES are eliciting more comprehensive information on small sums of miscellaneous income. The pattern for investment income is similar with slightly more non-zeros in the FES and a

rather lower median value. However, mean income from this source is actually higher in FES, probably reflecting the banding of investment income in the BHPS which substantially reduces the highest incomes from this source.

Moving from sources of income to types of family, Table 7 takes the analysis one step further and examines the *composition* of the poorest decile group by family type.

Table 7.
Poorest Decile Group in BHPS Wave One and FES 1991:
By Family Type

(%)	BHPS Wave One	FES 1991
Married Pensioner	9	9
Single Pensioner	15	10
Couple, with children	36	43
Couple, no children	8	10
Single, with children	20	13
Single, no children	11	16
Total	100	100

Focusing on the poorest households, the two surveys give somewhat different impressions as to which sorts of families are poor. The FES figures (which broadly mirror those published by DSS in their latest HBAI report cited earlier) show far fewer single pensioners and lone parents in the bottom decile group and rather more couples with children than the BHPS. The reasons for these discrepancies to some extent reflect the differential coverage of the various sources of income discussed earlier, but would merit much more detailed investigation.

5. Cross-section versus Longitudinal Perspectives

The comparative work of the previous section suggests that we should exercise some caution in assuming that used as a cross-section, the BHPS will produce similar results to existing cross-section household surveys. Nonetheless, it will be informative to see how the panel dimension of BHPS might add to our understanding of changes in the income distribution.

To begin with, we treat Waves One and Two of the BHPS as if they were entirely separate cross-section surveys, undertaken in successive years. Table 8 shows the composition of the poorest decile group in Wave One and Wave Two on this basis. The only concession we make at this stage to BHPS's panel nature is that we only include individuals who gave full interviews and provided full income information in both Waves. The results are presented on an unweighted basis because of the lack of suitable weights for this particular subgroup. As will be apparent from Table 8, the use of a different subsample on an unweighted basis has a marked effect on the results for Wave One.

Table 8.
Poorest Decile Group in BHPS Wave One and Two: By Family Type
(Unweighted, respondents to both waves only)

(%)	BHPS Wave One	BHPS Wave Two
Married Pensioner	10	7
Single Pensioner	18	16
Couple, with children	31	35
Couple, no children	7	10
Single, with children	24	19
Single, no children	10	13
Total	100	100

Treating the first two waves of the BHPS as if they were successive cross-sections would imply quite a marked shift in the composition of the poorest decile group. In particular, the representation of pensioners declines quite sharply whilst that of people of working age (excluding lone parents) increases. Interestingly, this is not out of line with the changes in the official HBAI series between 1990/91 and 1991/92 which also show an improved position for pensioners mainly at the expense of other childless households.

Next we compare the median income of the bottom decile group in Wave One with the median income of the bottom decile group in Wave Two, in each case at

January 1991 prices. This shows a fall from around £88 pw to £86.[4] The question then becomes, does this enable us to conclude that "the poor" got poorer by around 3% ?

In order to answer this question we take advantage of the panel element of the BHPS, and instead calculate the average change in income between Wave One and Wave Two of all individuals who were in the bottom decile group in Wave One, *irrespective of their position in Wave Two*. This shows an increase from £88 to £110, or a rise of roughly 25%. Clearly therefore, the group who were "poor" in 1991 were actually markedly better off on average by 1992. So how can it be that the median income of the bottom decile group actually fell?

This apparent paradox is resolved by examining those individuals who were not in the bottom decile group in Wave One but entered the bottom decile group in Wave Two. A preliminary examination of the data suggests that in the region of half of those who were in the bottom decile group in Wave One had "escaped" by Wave Two and had been replaced by different individuals. It is however necessary to be extremely cautious about estimates of this nature based on relatively small numbers of individuals. In particular, closer examination of individual cases suggests that some of the volatility in incomes may be due to problems with data coding rather than from actual changes in personal circumstances. Nonetheless, the general pattern shown in Table 9 is likely to be relatively robust to coding problems with particular households.

Those individuals who entered the bottom decile group experienced a marked fall in income - on average from £161 in Wave One to £84 in Wave Two. The entry of this group was enough to drag down the median for the bottom decile group in Wave 2 below the level of the corresponding group in Wave One. To illustrate this point, Table 9 summarises the changes in average income for individuals who were in the bottom decile group in either or both waves.

Table 9.
Median Income in Wave One and Wave Two of individuals in bottom decile group in either or both waves.

(£ pw, January prices)	In Bottom Decile Group in Wave 2	Not In Bottom Decile Group in Wave 2	All
In Bottom Decile Group in Wave 1	£86 -> £88	£92 -> £134	£88 -> £110
Not In Bottom Decile Group in Wave 1	£161 -> £84	£229 -> £237	£225 -> £229
All	£114 -> £86	£220 -> £231	£210 -> £217

4 This is analogous to the process undertaken in HBAI analysis when the median income of the bottom decile group in 1979 is compared with the corresponding group in 1991/92.

Table 9 highlights a number of interesting results:

a) those who were in the bottom decile group in both waves actually saw a small real rise in their income (from £86 to £88);

b) those who "escaped" from the bottom decile group in Wave 1 had higher average incomes in Wave 1 than those who remained in the bottom decile group (£92 as against £86);

c) those who were "new entrants" to the bottom decile group in Wave 2 had typically lost almost half of their income compared with a year earlier.

Notwithstanding reservations about the precise results, the principle emerges very clearly that using a repeated cross-section (such as successive years of FES) to examine trends in low income can conceal a great deal of the fluidity in personal financial circumstances.

6. Conclusions

The use of repeated cross-section data to track trends in poverty and low incomes has provided a great deal of information about the sorts of families who tend to be at various points in the income distribution. What such data has not allowed us to determine is how long people stay at those income levels, and what are the forces which cause their financial circumstances either to improve or to deteriorate. Panel data such as the BHPS are an important part of attempting to answer such questions.

As regards the BHPS itself, the achieved sample of around 5,500 households is around one fifth smaller than the Family Expenditure Survey, partly no doubt reflecting the greater complexity of collecting panel data. Because the BHPS is a multi-purpose survey this limits the usefulness of the data from the perspective of analysing the distribution of income. In only 3,688 households was there no need to impute some missing income information, and this inevitably reduces confidence in the data.

Partly in consequence of these limitations, a comparison of the income data in BHPS and FES suggests some marked differences. Although mean disposable income is very similar in both surveys, the composition of this total differs noticeably with BHPS picking up less income from investments and other sources. The implications of this for estimates of the composition of the low income population are to understate the position of those heavily dependent on investment income such as single pensioners, relative to FES-based results. Having said this, the results for changes between waves (as opposed to levels) are more convincing. In particular, the general result of an improvement in the relative position of pensioners between 1991 and 1992 is also reflected in the FES-based HBAI series.

It is of course in terms of changes over time that panel data comes into its own, and we have shown that the BHPS casts interesting light on changes in the incomes of the poorest group. A comparison of the bottom decile group in 1991 with the bottom decile group in 1992 shows a fall in median income - in other words, "the poor" have apparently "got poorer". However, taking advantage of the panel element of the data reveals that this single result conceals a great diversity of outcomes. Those who remained in the bottom decile group saw a slight increase in their income; those who "escaped" the bottom decile group - a significant proportion of the original group - saw a marked rise in their income; but those who were new entrants to the bottom decile group had lost almost half of their income compared with a year earlier.

Whilst BHPS has considerable limitations it is one of the few data sources which enable us to examine in more detail the dynamics of poverty and low incomes. It is clear from these results that current statistics on the income distribution may conceal a great deal of the fluidity in personal financial circumstances. Even this preliminary analysis indicates that there is not a single homogeneous group who

are "the poor" and whose lot is permanently to remain poor. Rather, fluctuations in personal circumstances lead to considerable variations in living standards even from one year to the next.

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Technical Appendix

1. Methods of Imputation of Missing Values

Two main methods of imputation are used in the data used here where the answers to questions are for some reason missing.

i) "Hot-Deck" Imputation

In this case, the sample is divided into cells according to categories which might be relevant to the variable being imputed. For example, if the value of retirement pension received was missing, the sample might first be divided into cells according to age band, sex and marital status. Next, for each individual in the cell with a missing value, a random individual from the cell with a non-missing value is drawn and the non-missing value is imposed on the individual with the missing value. Thus for a single woman pensioner in her early seventies who did not know how much pension she was receiving, another single woman pensioner of similar age who did know how much pension she was getting would be randomly drawn and it would then be assumed that the first woman was also receiving the same amount.

The main types of income where this approach was adopted were banded income from investments and dividends (see below) and cases such as welfare benefits where "regression methods appeared inappropriate" (Taylor, M.F 1994 op. cit. pA.46).

ii) Regression Imputation

Missing money amounts for pay and for housing costs variables were imputed using a regression technique known as "predictive mean matching". First a simple linear regression was carried out on the basis of individuals/households with non-missing values for the variable in question. Next a predicted value for *all* observations was obtained, and the observations with missing values were matched with the observation with a non-missing value which had the closest predicted value. Finally, the *true* value for the observation with the non-missing value was imposed on the observation with the missing value.

Naturally, this approach was more satisfactory for some variables than others. In terms of goodness of fit, the regression for gross current pay had an adjusted R-squared of 0.79, those for self-employed pay and pay in job-history spells an R-squared in the range 0.50 - 0.65, and that for pay in a second job, 0.22.

2. Which version of the BHPS is being used here?

When Wave One of the BHPS was first released, the data contained a large number of missing values for particular variables. This occurred typically where respondents did not know or would not give the answer to a particular question. When Wave Two was released, a second version of Wave One was released which contained *imputed* values in respect of many of the missing values. The process of imputation is described more fully above. Similarly, the first release of Wave Two contains many missing values, for which no imputed values are currently available. The current study is based on this first release of Wave Two and the initial re-release of Wave One.

It is understood that when Wave Three data is released a revised version of both Waves One and Two will also be released. Data for all three waves will contain imputations for missing values. These imputations will be based partly on the techniques described above but also by checks with data from other waves for the same household. It should be noted therefore that analysts using the latest revision of the Wave One data will obtain somewhat different results to those reported here because of the revised process of imputation.

3. Problems with Housing Benefit data[5]

When individual respondents are asked about their incomes over the twelve months prior to interview, they are shown a set of "prompt cards" in order to remind them of possible sources of income which they might have received. A problem has occurred with the BHPS data between Wave One and Wave Two which seems to have arisen from a change in the wording on one of the prompt cards relating to Housing Benefit. Specifically, the data for Wave Two contains a sharp drop in the number of people reporting receipt of Housing Benefit.

The problem seems to have arisen because the Wave Two prompt card refers specifically to Housing Benefit "paid directly to you", rather than a more general reference to "Housing Benefit (Rent Rebates and Allowances)" on Wave One. For individuals whose Housing Benefit is paid directly to their landlord, or who are low-income council tenants and whose Housing Benefit is credited against their rent at source, it is possible that the revised wording led them to conclude that their circumstances were not covered.

There is however an alternative way of attempting to infer current receipt of Housing Benefit. This is on the basis of the *household* questionnaire, which asks about net rent (ie allowing for benefits) and gross rent (ie what the rent would be in the absence of benefits). These questions appear to have been answered consistently across the two waves. The approach adopted for this paper therefore is to disregard all individual responses to the income questions about Housing Benefit, and instead to ascribe Housing Benefit to those households whose gross rent was in excess of their net rent. On Wave One the two measures are in general quite similar, but, as Figure A shows, in Wave Two a significant amount of Housing Benefit would be missed if the individual level data were to be used.

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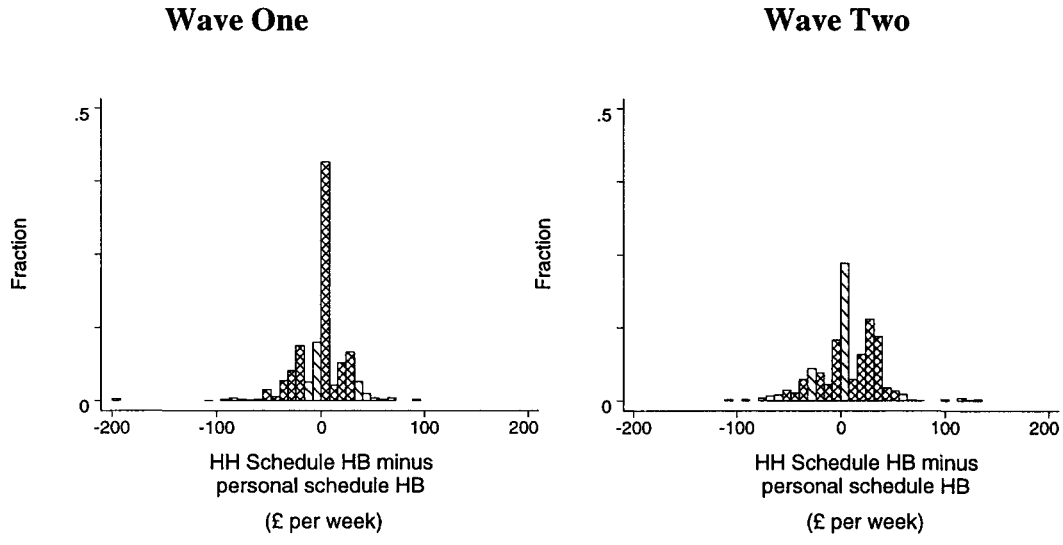
5 I am grateful to Stephen McKay and Robert Walker for alerting me to this discontinuity.

Figure A.
HB inferred from Household Schedule less HB declared in Individual Schedule



4. Definitions and Samples Used

The main definition of income used in this paper is equivalent weekly household disposable income. The income of all household members from all sources is accumulated, direct taxes are deducted (excluding lump sums) and the result is adjusted by means of the McClements "equivalence scale" to reflect the composition of the household. Each individual in a household is then ascribed the same household equivalent income.

This definition is chosen to be as close as possible to the DSS's "Before Housing Costs" measure used in the *Households Below Average Income* series. However, because of differences in the questions asked between the BHPS and the FES it is not possible straightforwardly to construct a precisely comparable measure. In particular, the measure used here does not deduct local tax bills from income, does not deduct lump sum payments of income tax and NICs, and is not adjusted to reflect under-reporting of the very richest households.

For cross-section results on BHPS, the sample used is households containing at least one respondent adult, with results being weighted by the cross-section weights for enumerated individuals. For the longitudinal analysis, a further sample selection is applied, which is to drop any household where on Wave One a component of household income has been imputed or on Wave Two a component is missing. No weights are applied to these results.

FES results are subject to the sample selection used in HBAI analysis. In a particular, households containing someone who is either short-term self-employed or temporarily separated from their partner are excluded. Data for the second quarter of 1991 are also excluded because of concerns about the quality of the data on the Community Charge.