

# Accounting for housing in poverty analysis

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### Non-Technical Summary

The way in which housing consumption and housing costs are treated when measuring income has some important implications for poverty analysis and conclusions about the anti-poverty effects of policy reforms. This is because the number of people counted as poor (e.g. with income falling below a threshold) depends crucially on the income concept adopted.

Official UK low income statistics use two alternative income measures: 'Before Housing Costs' (BHC), where housing costs are not deducted from the income figure, and 'After Housing Costs' (AHC), where they are. Both measures pose problems: BHC income does not capture the advantages of living in owner occupied housing and AHC income might not account for the benefits of living in higher quality accommodation.

In this paper we use Family Resources Survey data and compare child and pensioner poverty estimates for the UK both under actual policies and under policy reform scenarios, based on the traditional BHC and AHC measures and also following an alternative 'imputed rent' (IR) approach. The IR approach consists in adding to BHC income the difference between the estimated value of housing consumed and housing costs. In this way the IR measure captures the variation in the amounts paid out of cash income for housing and also recognises the higher relative living standards of households living in higher quality housing.

Results suggest that once the net value of housing consumption is accounted for, child poverty risk is not significantly different from that estimated using the official BHC income measure, although the composition of children counted as poor is different. In contrast, pensioner poverty risk would fall to about one quarter its BHC value using the IR measure.

Measures of the success of policy reforms in tackling poverty, such as the absolute reduction in the numbers counted as poor, are almost unaffected by the choice of income measure in the case of children. In contrast, the effect of a budgetary-equivalent reform for pensioners varies, depending on the chosen income measure. It is smallest for the IR measure because pensioner poverty is already low using this income definition.

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## Abstract

The treatment of housing in the definition of income used to measure poverty makes a big difference to who is counted as poor. Both the Before Housing Costs (BHC) and After Housing Costs (AHC) measures in current use in the UK pose problems. We compare BHC and AHC income with an alternative measure, overcoming their respective flaws by including in income the difference between the estimated value of housing consumed and housing costs, or net imputed rent. We investigate whether findings about poverty among children and pensioners, and the effectiveness of poverty-reducing policies, are affected by accounting for housing in this way.

**Keywords:** poverty, imputed rents, income measurement, housing costs

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## **Introduction**

Income remains a core concept employed in poverty indicators and analysis despite being regarded as an incomplete measure of living standards, especially for those at the bottom end of its distribution (Atkinson et al., 2002). The number of people counted as poor (e.g. with income falling below a threshold) depends crucially on the income concept adopted. Issues related to income measurement, such as the reference time period and unit of income assessment, as well as the definition of the income concept itself, have attracted considerable debate, which has had an impact on the methodology adopted in official low income statistics.

One aspect of the measure of income used in poverty analysis that has drawn particular attention in the UK is the treatment of housing costs. Housing is deemed an integral component of family well-being, and has been a longstanding central concern of British governments and, in more recent years, has been pledged as a key component in tackling poverty and social exclusion agenda (Department for Work and Pensions (DWP), 2003). As well as the physical standard of housing itself being important in avoiding deprivation, the affordability of housing costs in relation to income is a major factor that impacts on the standard of living that can be achieved (Atkinson et al., 2002). Recognising that the cost of housing does not always match its consumption value, the official UK low income statistics Households Below Average Income (HBAI) present two alternative income series: 'Before Housing Costs' and 'After Housing Costs' (DWP, 2009). Before Housing Costs (BHC) income corresponds to the measure generally adopted for poverty analysis in the countries of the European Union and is now the primary income measure used in the

assessment of child poverty in the UK (DWP, 2003). It includes housing benefits in cash and does not deduct housing costs from the income figure, treating housing as any other consumption component. The problem is that in practice changing accommodation in order to meet a preferred housing cost level might be expensive and proportionally more so for people at the bottom end of the income distribution. Furthermore, variation in housing costs between households with comparable housing quality may arise simply as a result of living in a particular region or being at a particular stage in the life cycle, or as a result of fluctuating interest rates (Johnson and Webb, 1992; Buck et al., 2007).

For these reasons the second measure of income 'After Housing Costs' (AHC) provides an alternative perspective. AHC income is BHC income less gross housing costs. In factoring out housing costs the issues raised above are dealt with, but the fact that households occupy dwellings of different quality, affecting their relative standards of living, is not. First of all, some households are able to move house to find their desired quality-cost combination. For example, there is the case of young people who have chosen to buy relatively expensive accommodation, finding themselves in the lower part of the AHC distribution, at least temporarily. This choice can be seen as a form of saving to acquire an asset that might appreciate in the future, rather than a cost incurred for housing consumption (Gardiner et al., 1995). More generally, the AHC measure understates the relative standard of living of those enjoying better housing either through choice or good fortune.

Indeed there are wider issues to be confronted in making welfare comparisons across households in different housing tenures. Social tenants benefit

from a “social wage” in the form of a subsidised rent (Sefton, 2002). Owner occupiers who own outright, or who have paid off some of their mortgage, benefit from living in their home to a greater extent than is indicated by the housing costs that they pay on a regular basis.

To account for the difference between housing costs paid and quality of housing enjoyed, we take one step towards a more complete picture of individuals' command over resources, in the spirit of the *comprehensive income* concept. This third approach is to use the housing costs-to-quality relationship observed in the private rental market to impute a value for housing consumption, net of the housing costs actually incurred, across all tenure types. We then add this measure of net imputed rent to BHC income. We refer to this as the imputed rent (IR) approach.

Imputed rent constitutes a large component of private in kind income in most European countries (Frick et al., 2008). Accounting for it acquires special relevance in the context of international comparisons of living standards and housing welfare provision, where different countries might adopt different mixtures of cash and in-kind housing support (Gottshalk and Smeeding, 1997; Canberra Group, 2001). Contributions in the literature have offered empirical evidence of a strong inequality-reducing impact of imputed rent both in EU countries (Smeeding et al., 1993; Eurostat, 1998; Frick and Grabka, 2003; Frick, Goebel and Grabka, 2007; Frick et al., 2007) and elsewhere in the world: Yates (1994) for Australia, Buckley and Gurenko (1997) for Russia and Gasparini and Escudero (2004) for Argentina. Measures of IR have also been included in the new European Union Statistics on Income and Living Conditions (EU-SILC) data, to enable the incorporation of IR in

the calculation of social indicators across the European Union (Eurostat, 2005). The aim of the paper is to demonstrate the difference the IR approach makes to income poverty measures for the UK. First, we draw out the implications for particular groups and their measured risk of poverty. Given recent UK policy attention, we focus on children and older people (referred to as “pensioners”, being over current state pension age). According to the official statistics, the risk of experiencing poverty is significantly higher for children and pensioners than it is for the working age population using the BHC measure, and also for children using the AHC measure (DWP, 2009). We explore whether this remains the case using the IR measure. In a second exercise we examine how conclusions about the effectiveness of some stylised poverty-reducing policies, targeted at children and pensioners in particular, would differ under the IR measure and the two traditional measures.

Our methodological approach to estimating imputed rent draws on international work and is outlined below, followed by a description of the income measures and methods used in the analysis as a whole. We then present the poverty results under alternative income concepts, and findings concerning the sensitivity of the effects of simulated policy reforms to the choice of income concept.

### **Imputing rents**

We use the 2003/04 Family Resources Survey (FRS) data which include 28,860 private households in UK. The survey provides detailed information about individual income from various sources as well as housing costs and is used as the basis for the official HBAI low income statistics (DWP, 2005). Information on tenure type and housing characteristics is also provided and is used to derive IR.

The net imputed rent consists of what the occupant of a non-privately rented dwelling would need to pay in gross rent if renting in the private market, minus what they actually pay to live there. Amongst the methods previously used to derive a measure of imputed rent, some are based on the capital value of the owned accommodation and view imputed rents as a return on invested capital. For the purpose of measuring the value of housing consumption, however, a rent imputation based on the 'price-to-house-characteristics' relationship observed in the private rental market seems more appropriate; it also allows us to estimate the "social wage" element of imputed rent for social tenants and a value of IR for those living rent-free, as well as the IR of owned accommodation. We follow this latter method and estimate a hedonic price regression on a sample of dwellings rented in the private market and use the estimated parameters to predict the imputed rent for owned, social rented and rent-free accommodation. The IR income measure is then obtained by adding the predicted imputed rent (net of any housing cost actually incurred - mortgage interest payments, rent payments, structural insurance and maintenance costs) to the standard BHC cash disposable income.

TABLE 1: Housing tenure distribution in the United Kingdom

	Sample numbers (households)	Proportion of people (weighted)		
		Population	Children	Pensioners
Own outright	8,857	25.4	8.8	67.7
With mortgage	10,853	47.1	59.3	7.7
Private rent	2,178	7.9	7.4	2.0
Social rent	6,567	18.5	23.6	21.0
Rent free	404	1.1	1.0	1.6
Total	28,859	100.0	100.0	100.0

Source: our calculations based on the Family Resources Survey 2003/04

Table 1 shows the distribution of self reported tenure type from the FRS. About 8% of the population occupy housing in the private rental market and we use households from this tenure type to estimate a hedonic regression for market rent, using reported information about gross rent paid and house characteristics.

We adopt a log-linear specification, assuming a linear relationship between the logarithm of rent and a set of explanatory variables including the number of bedrooms, the Council Tax band, dummies for the presence of central heating and whether the accommodation is let furnished or not, the number of years the household has been occupying the property and the region in which the property is located.<sup>1</sup> Regression results are given in Table 2. The estimation is based on a sample of 1,145 private tenants holding assured short hold letting agreements. Such cases represent approximately half of private tenants, but can be regarded as most representative of the private rental market prices that we wish to capture. Rents paid for these dwellings will be close to the prevailing market rent whereas those for other types of tenancies may relate to non-market agreements or contracts that were entered into some time in the past.<sup>2</sup>

The reference accommodation is a one bedroom house, unfurnished, in Council Tax band A, with no central heating, located in the North East of England and in which the household has been living for less than 2 years. Coefficients in Table 2 can be interpreted as the percentage increase in gross rent that would result from a change in the value of each covariate for the reference accommodation, other things being equal. So for example, the market rent is 16.2% higher for two bedroom

houses and respectively 21.3% and 35.0% higher for three and four or more bedroom houses, compared with one bedroom houses.

Table 2 Predicting Log Rent for Assured Shorthold tenants

Explanatory variables	coefficient	s.e.
Two bedrooms	0.162***	[0.031]
Three bedrooms	0.213***	[0.035]
Four or more bedrooms	0.350***	[0.055]
Central heating	0.098***	[0.034]
Council tax band B	0.129***	[0.033]
Council tax band C	0.260***	[0.037]
Council tax band D	0.355***	[0.043]
Council tax band E	0.444***	[0.061]
Council tax band F	0.589***	[0.075]
Council tax band G-H	0.868***	[0.106]
Council tax band: not valued separately	-0.261***	[0.068]
North West	0.141*	[0.081]
Yorkshire	0.131	[0.081]
East Midland	0.141*	[0.084]
West Midland	0.039	[0.082]
East	0.307***	[0.080]
South East	0.383***	[0.078]
South West	0.253***	[0.080]
Wales	-0.041	[0.089]
Scotland	-0.023	[0.079]
Northern Ireland	-0.145	[0.127]
Inner London	0.687***	[0.085]
Outer London	0.571***	[0.083]
Lived at address for 2 to 10 years	-0.119***	[0.025]
Lived at address for more than 10 years	-0.569***	[0.045]
Property rented furnished	0.083***	[0.028]
Constant	4.031***	[0.081]
Observations	1,145	
R-squared	0.540	

Standard errors in brackets; \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%  
*Source:* our calculations using FRS 2003/04.

Central heating increases rent by one tenth and furniture by about 8%. The rent level progressively increases for accommodation classified in higher Council Tax bands, up to an 87% increase for band G and H housing, relative to band A

accommodation. Location in London increases market rent by 60% to 70%, and by 25% to 40% in the South East, South West and East, relative to a location in the North East. Rent is 12% lower for accommodation occupied for more than two years and about 57% lower for accommodation occupied for more than ten years. This indicates the extent to which, in longer tenancies, rent does not keep pace with market increases. For this reason, in the 'out of sample' prediction based on the estimated function, it is assumed that all (hypothetical) rental agreements were initiated within the last 2 years.<sup>3</sup>

Having obtained a value for the gross rent that home owners, social tenants and rent free tenants would need to pay for their current accommodation (gross IR), housing costs are deducted so that a net figure for IR can be obtained: the rent actually paid by reduced rent tenants, the amount of mortgage interest repayment for home owners with an outstanding mortgage, other costs related to maintenance and structural insurance and other charges that would in principle be paid by landlords. In some cases the deduction of these costs results in a negative value of IR implying that the cost of housing consumption outweighs any benefit that can be imputed to it. Negative IR, reducing income below its BHC level, applies to about 5% of home owners repaying a mortgage and about 3% of social tenants. Table 3 presents the resulting amount of weekly gross and net imputed rent, by tenure type. It shows how net imputed rent is significantly lower than the gross value for the tenure types with larger average housing costs: owners with a mortgage and social tenants.

## **Poverty analysis: methods and income measurement**

Our analysis of the BHC, AHC and “IR” income measures are based on the same FRS data as is used to impute IR. In order for all our empirical results to be consistent with each other we use incomes as simulated by POLIMOD, a tax-benefit model for the UK (Redmond et al., 1998), rather than using incomes as recorded in the FRS. We can, therefore, compare the incomes following simulated policy reforms with the incomes prevailing under 2003/04 policies. The POLIMOD simulated incomes have been defined to be as similar as possible to those used in the HBAI (DWP, 2009), both BHC and AHC. POLIMOD calculates liabilities for income tax and National Insurance contributions (NICs) and entitlements to Child Benefit, Working Tax Credit, Child Tax Credit, Income Support (including income-related Job Seekers Allowance), Pension Credit (including Savings Credit), Housing Benefit (HB) and Council Tax Benefit. Otherwise, elements of income (all original incomes and contributory and disability benefits) and housing costs (rent measured gross of HB) are drawn from the recorded values in the FRS dataset. The effects of non take-up of means-tested benefits and tax credits are estimated by applying the take-up proportions estimated on a caseload basis by the DWP (2006) and HM Revenue and Customs (2006).<sup>4</sup>

In common with HBAI our analysis uses the modified OECD equivalence scale to adjust BHC incomes for differences in household size and composition. The scale values are 1 for a single adult, 0.5 for any additional adult and 0.30 for a child under 14. In HBAI analysis of AHC income this scale is adjusted to allow for the fact

that housing economies of scale do not need to be taken into account. For simplicity here we use the same scale for all three income measures. As in HBAI analysis we define the poverty line as being 60% of median household equivalised income. This threshold naturally varies with the income concept that is used.

The distribution of simulated incomes is somewhat different from the distribution of recorded incomes. The appendix compares poverty thresholds and rates for 2003/04 from HBAI with those estimated from POLIMOD for BHC and AHC incomes. Discrepancies are mainly due to the fact that simulated income tax assumes that incomes, as recorded for a particular month in the FRS, are received in the same way all year and that the adjustments made for the non take-up of benefits cannot exactly match actual take-up behaviour. However, our focus is on the differences made by the inclusion of IR in income, rather than levels of poverty risk as such.

In the analysis of the effect of the choice of income concept on measured poverty we focus on poverty risk among children and pensioners. Children are defined as being aged under 16 or under 19 if in full time secondary education or themselves married. Pensioners are defined as men aged 65 or more and women aged 60 or more. As shown in Table 1 there are significant, but not surprising, differences in the distribution of tenure types for these two groups. While about two thirds of pensioners own outright, less than one in ten children live in owned-outright housing. About the 60% of children live in housing with an outstanding mortgage but less than 8% of pensioners are in this position. A very low proportion of pensioners are private tenants, and about 7% of children live in private rental

accommodation. However, the shares of children and pensioners living in social housing are comparable at slightly over 20%.<sup>5</sup> This suggests that on average households with pensioners are likely to incur lower housing costs compared with households with children and, other things being equal, are likely to benefit to a greater extent from housing consumption that is not accounted for in the traditional measures. Table 3 shows net IR separately for children and pensioners, in contrast with IR for the population as a whole.

Table 3 Estimated weekly imputed rent (£) by tenure type and demographic group

	Gross IR		Net IR					
	Population		Population		Children		Pensioners	
	<i>Mean</i>	<i>sd</i>	<i>Mean</i>	<i>sd</i>	<i>Mean</i>	<i>sd</i>	<i>Mean</i>	<i>sd</i>
Own outright	140.2	59.7	126.1	57.7	137.3	68.0	122.3	54.6
Own with mortgage	137.7	55.0	67.6	53.0	66.2	52.1	88.6	62.7
Social rent	107.1	42.9	46.9	39.2	50.6	41.9	42.8	31.2
Rent free	129.8	65.3	129.3	65.2	132.2	68.1	123.7	57.7
All types	132.1	55.8	74.1	61.7	64.6	57.8	100.6	61.8

*Source:* our calculations using FRS 2003/04

In both cases, outright owners and people living rent free are allocated the highest amounts of net imputed rent, followed in order by owners with an outstanding mortgage and social tenants. Generally, the level of IR within tenure type is similar across the two demographic groups. However, average imputed rent for outright owner and social tenant pensioners is not as large as for the households in which children live, possibly reflecting the lower quality or smaller size of housing in which older people live, relative to children in these tenure types. In the case of housing owned with a mortgage the reverse is shown, reflecting pensioners' later stage in the repayment of their mortgage.

## Results: poverty using alternative income concepts

We consider the effect of the choice of income concept on poverty rates.<sup>6</sup> Table 4 reports each index calculated according to the BHC, AHC and IR income measures for children and pensioners, and their decomposition by tenure type, together with the value of the poverty threshold for each measure of income.

Table 4 Child and pensioner poverty rates by tenure type%

	Child poverty			Pensioner poverty		
	BHC	AHC	IR	BHC	AHC	IR
Own outright	22.0	18.4	14.8	27.5	22.2	3.7
Mortgage	11.9	14.1	11.5	16.1	17.2	7.3
Private tenants	17.6	54.8	36.8	10.9	38.9	17.7
Social tenants	40.8	63.3	45.0	10.3	44.3	9.1
Rent free	28.3	25.1	15.1	36.4	26.0	3.5
All	20.2	29.2	21.6	22.8	26.9	5.4

Source: our calculations using POLIMOD with FRS 2003/04

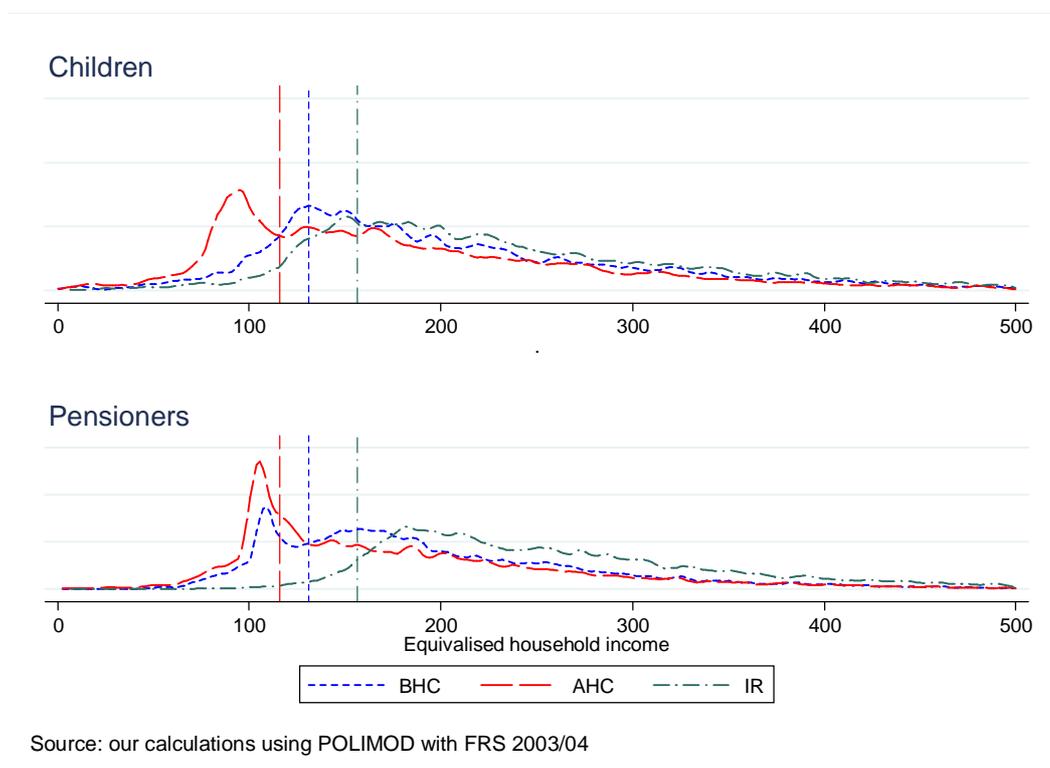
Focussing first on children it is clear that the two official measures provide different indications of the prevalence of child poverty. According to the BHC measure, 20% of children have household incomes below the poverty line, with poor children over-represented amongst social tenants. On an AHC basis, the proportion of children living in poverty is higher by almost half of its BHC value at 29% and children in private rented accommodation as well as social housing are disproportionately represented. Once net imputed rent is added to BHC income the child poverty rate reaches a level between that of the BHC and AHC measures (22%) and the relative risk of poverty by tenure shifts relative to each of the official measures. Children in owned-outright housing have a lower poverty risk using the

IR measure than under either the BHC or AHC measures (15% compared with 22% or 18%) while children in housing owned on a mortgage have a similar risk using the IR measure as they do on a BHC basis. However children in social and private rented accommodation have an IR poverty risk that is higher than that using BHC but lower than that using AHC income. It may at first sight be surprising that the child poverty risk among private tenants is any different under the IR measure than using BHC income, since no imputed rent has been added to the income of these households. However, the poverty threshold, measured as 60% of median income is 19% higher under the IR measure than using BHC income. While the incomes of private tenant households are not affected by the shift from BHC to IR, their incomes relative to the median have fallen.

The relationship between the poverty thresholds and the distributions of the three income measures can be seen more clearly in Figure 1, which shows the distributions separately for children and pensioners. For children, both the threshold and the distribution move to the right with the addition of imputed rent, leaving the IR poverty rate little different from that under the BHC measure. In contrast, for pensioners the concentration of pensioners below the poverty line evident for BHC as well as AHC income, disappears for the IR measure. As a consequence, pensioner poverty risk is strikingly reduced to 25% of its BHC value. Poverty risk is especially reduced for home owners, and also rent free tenants. As for children, private tenant pensioners, a small group, appear at a higher risk of poverty under the IR measure.

The main reason for such different outcomes between pensioners and children lies in their tenure status differences.

Figure 1 Income distribution and poverty thresholds using alternative income concepts



Pensioners, as discussed above, mostly own outright and therefore are attributed with a large amount of net IR. Children on the other hand mostly live in housing with an outstanding mortgage, or social housing.

### **Are reform evaluations sensitive to the income measure used?**

In this section we assess the extent to which conclusions about a particular policy reform are sensitive to the income measure chosen to evaluate its effect on poverty. We simulate two simple reforms to the UK tax and benefit system aimed at tackling child and pensioner poverty respectively. For illustrative purposes the two reforms

are designed to have the same budgetary cost. Thus we can, in a stylised manner, consider which reform provides better value in terms of its poverty-reducing implications and then consider whether the choice of the income measure used to define poverty makes any difference to this assessment.

The reform intended to reduce child poverty is an increase to the Child Tax Credit (CTC) per-child amount. We simulate an increase of £12 a week in the per-child maximum amount using the POLIMOD microsimulation model. This reform, which represents a 43% increase in the per-child payment, has been chosen for our illustration because it corresponds approximately to the increase that has been suggested as being the minimum amount necessary to achieve the UK target of halving child poverty by 2010 (Hirsch 2006).<sup>7</sup> We estimate the first round net budgetary cost to the government as being £3.8 billion a year.<sup>8</sup> The reform is not simulated as revenue-neutral, as the distributional impact of the additional tax burden would act as a confounding factor.

The reform intended to reduce pensioner poverty is instead an increase in the means-tested Pension Credit (PC), whose 'guarantee element' tops income up to a maximum amount of £102.10 per week for a single person and £155.80 for a couple (in 2003/04), depending on personal circumstances. The simulated reform adds an extra 18.7% to the Guarantee maximum (equivalent to £19.05 per week for single pensioners and £28.45 for pensioner couples). This increase is designed such that the first round cost to the government is the same as the reform for children, described above.<sup>9</sup>

Table 5 Gainers (%) and the average increase in household income (£/ week) for children and pensioners following an increase in Child Tax Credit (for children) and Pension Credit (for pensioners)

	Children (CTC reform)	Pensioners (PC reform)
% Gainers		
All tenure types	50.4	44.0
Own outright	50.6	34.3
Mortgage	34.1	41.3
Private tenants	70.6	66.1
Social tenants	84.7	72.6
Rent free	62.2	65.3
Average gain among gainers (std. dev)	12.11 (4.40)	15.33 (8.39)

Source: our calculations using POLIMOD with FRS 2003/04

Table 5 reports the tenure type of those who gain from the simulated CTC and PC reforms and the average income increase across households that benefit. About 44% of all pensioners and 50% of all children would gain from these policies. The average increase in household income per pensioner gaining would be £15.33 per week, an amount not much larger than the average increase in household income per child gaining: £12.11.<sup>10</sup> In both groups people in private and social rented accommodation are more likely to gain. These are the tenure types more likely to be occupied by people entitled to means-tested benefits.

How effective the reforms are in reducing child and pensioner poverty according to the three income measures is shown in Table 6. According to the BHC measure, the CTC reform would succeed in lifting almost one in three children out of poverty. However, using the AHC income concept, the exit rate would be closer to one in five children only. This difference is solely because the number of children counted as poor is higher on the AHC basis. The number of children brought out of

poverty is almost the same in the two cases (830 thousand or 6.4% of all children) and is indeed very similar using the IR measure.

Table 6 Child and pensioner poverty reduction due to policy reforms, under alternative income concepts and by tenure type

	Children			Pensioners		
	BHC	AHC	IR	BHC	AHC	IR
Poverty rate BEFORE	20.2	29.2	21.6	22.8	26.9	5.4
Poverty rate AFTER	13.8	22.8	15.1	18.1	12.1	4.2
Reduction (ppts)	6.4	6.4	6.5	4.7	14.8	1.3
Exit rate %	32	22	30	22	56	26
Number leaving poverty	832,000	834,000	845,000	517,000	1,577,000	146,000
Tenure composition of those brought out of poverty (%)						
Outright owners	3.0	6.6	4.8	75.7	53.0	42.2
Own with mortgage	20.2	20.8	19.4	7.6	3.9	9.7
Private tenants	6.8	11.1	10.0	1.8	2.8	3.7
Social tenants	69.7	60.8	65.1	12.9	38.7	42.1
Rent free	0.3	0.6	0.8	2.3	1.6	2.1
All	100.0	100.0	100.0	100.0	100.0	100.0

Source: our calculations using POLIMOD with FRS 2003/04

The tenure composition of those brought out of poverty is somewhat different when comparing the BHC with IR measures, however. There are fewer social tenants and more private tenants and outright owners, while the largest group brought out of poverty is clearly social tenants using all measures.

In the case of pensioners, the measurement of the impact of the PC reform on pensioner poverty as a whole is more sensitive to the choice of the income measure, than in the case of children: while the exit rates for pensioners are similar under IR and BHC, the numbers brought out of poverty are much lower using the IR measure. This is because pre-reform pensioner poverty using IR is very low and the proportional effect, while similar to that under BHC, represents a much small

number of pensioners (146 thousand, a third of the number brought out of poverty under the BHC measure). The contrast with the AHC measure is even larger, because the pre-reform AHC pensioner poverty is much higher: the reform appears very effective as moving more than half of the number counted as poor on this basis across the poverty line. The tenure composition of pensioners brought out of poverty also shifts significantly: away from outright owners and towards social tenants.

If one were judging, on the basis of the evidence presented here, whether spending on child or pensioner benefits would be more effective at reducing poverty among the respective group, the conclusion would depend on the income concept that was used. On an AHC basis the reform to PC would be extremely effective at moving pensioners across the poverty line. About twice as many pensioners would be brought out of poverty as children under the budget-equivalent CTC reform. On a BHC basis the numbers are relatively close, with child poverty reduced to a greater extent than pensioner poverty. Under the IR measure, pensioner poverty is much lower before the reform and the reform itself has a relatively small absolute effect on the poverty numbers. Using this income concept, spending the money on children seems like the more effective strategy.

## **Conclusions**

The way in which housing consumption and housing costs are treated when measuring income has some important implications for poverty analysis and conclusions about the anti-poverty effects of policy reforms. In this paper we have compared poverty estimates for the UK both under actual policies and under policy reform scenarios, based on the traditional BHC and AHC measures and also

following an alternative 'imputed rent' approach. The adoption of the IR measure can potentially provide a more comprehensive and consistent picture of living standards and therefore improve judgements about the success of policy reforms in terms of their implications for poverty or income distribution generally.

We find that once the net value of housing consumption is accounted for, child poverty risk is not significantly different from that estimated using the official BHC income measure. However, the composition of children counted as poor is different, with more children living in privately rented accommodation and fewer from owned outright housing being included. In contrast, pensioner poverty risk would fall to 5% (one quarter its BHC value) using the IR measure.

Measures of the success of policy reforms in tackling poverty, such as the absolute reduction in the numbers counted as poor, are almost unaffected by the choice of income measure in the case of children and an increase in CTC. In contrast, the effect varies for pensioners and a budgetary-equivalent increase in PC, depending on the chosen income measure. It is smallest for the IR measure because pensioner poverty is already low using this income definition.

One can argue about whether IR *should* be included as income for poverty measurement. On the one hand, as we have explained, including IR allows better comparisons between incomes across tenure types: it captures the fact that some households, such as those owning outright, pay little for housing out of cash income, whereas this is not the case for BHC income. At the same time the IR measure overcomes the drawbacks of the AHC measure, potentially concealing the effect on relative living standards of households living in higher quality housing.

On the other hand, adopting the inclusion of IR as standard in poverty measurement would pose challenges in practice. It would require a better assessment of the costs of ownership than has been possible in this study. For example, some deductions from income would need to be made for the elderly person living in an owned dwelling that is in need of repair and which they are unable to maintain. Put another way, aspects of housing quality that are not captured by the variables available to us would need to be included. Nevertheless it seems clear that the inclusion of IR would reduce the assessed risk of poverty for pensioners as a whole relative to children as a whole. This would have the effect of re-emphasising the already high profile policy problem of child poverty in the UK which remains insensitive to the treatment of housing income that we have considered here.

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<sup>1</sup> Descriptive statistics for the relevant covariates, by tenure type, are available from the authors on request.

<sup>2</sup> As a robustness check, the estimation was repeated on the whole sample of private tenants and also on “trimmed” samples where a percentage of top and bottom rent value cases were excluded. Most coefficients were significant and comparable in size across the four estimation samples. Despite the reduced sample size, the estimation carried out on the assured short hold agreements sample exhibited the highest R squared.

<sup>3</sup> Also, owned accommodation is treated as being rented unfurnished.

<sup>4</sup> Where ranges of take-up proportions are published, the mid point is used.

<sup>5</sup> Note that the ‘social rent’ category mainly includes those living in accommodation rented from Local Authorities or Housing Associations but also includes a few cases (3% of the group) renting from an employer or a family member.

<sup>6</sup> Similar results are found for the remainder of the poverty indices from the Foster Greer Thorbecke (1984) class. FGT0 corresponds to the headcount ratio or poverty rate, used here. The FGT1 index measures the average ‘poverty gap’ (the distance from the poverty line) as a proportion of the poverty line. The FGT2 index is similar to the FGT1 but gives more weight to the largest poverty gaps.

<sup>7</sup> However, due to other differences in assumptions the estimates here and those used by Hirsch (2006) are not strictly comparable.

<sup>8</sup> This estimate allows for some non take-up of entitlements to CTC. For example, caseload take-up for working families of CTC and WTC was 91% for lone parents and 73% for couples in 2003 (HMRC, 2006).

<sup>9</sup> Allowing for non take-up of PC between 63% and 73% (DWP, 2006).

<sup>10</sup> The difference is simply a function of the extra spending being somewhat more concentrated among fewer pensioners. There were 23% more children than pensioners living in UK households in 2003.

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## Appendix

Comparing poverty thresholds (un-equivalised £ / week) and poverty rates (%) from HBAI and POLIMOD 2003/04

	Before Housing Costs		After Housing Costs	
	HBAI	POLIMOD	HBAI	POLIMOD
Poverty threshold (for a single person)	123	131	98	116
Poverty Rate: All	18	17	21	23
Children	22	20	29	29
Pensioners	23	23	21	27

*Source:* DWP (2009; tables 3.7ts and 6.6ts), DWP (2005; table 2.3) and our calculations using POLIMOD based on the Family Resources Survey 2003/04.

*Note:* The equivalence scale used for the HBAI results is the modified OECD scale for the BHC measure and the “companion” scale for the AHC measure. POLIMOD estimates use the modified OECD scale for BHC and AHC equivalisation.