IMPUTED RENT AND INCOME INEQUALITY:

A DECOMPOSITION ANALYSIS FOR THE UK, WEST GERMANY AND THE USA

by

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http://www.iser.essex.ac.uk/epag/pubs/2002.php

"The rich man in his castle,
the poor man at his gate.
God made them high and lowly,
and ordered their estate".

Cecil Frances Alexander, 1848

Abstract

This article deals with income advantages derived from owner-occupied housing (Imputed Rent, IR) and their impact on the personal income distribution. Using micro-data from the British Household Panel Study (BHPS), the German Socio-Economic Panel (SOEP), and the US Panel Study of Income Dynamics (PSID) we find distinct cross-national differences in terms of the prevalence and extent of IR. In line with the international literature we also find a tendency towards a reduction of income inequality in Germany and the USA when IR is included in our measure of disposable income. However, results from inequality decomposition analyses show this overall impact to be the net effect of two conflicting changes: On the one hand there is increasing income inequality *between* the groups of owner-occupiers and renters, respectively, and on the other hand we find inequality to be decreasing *within* the group of those owner-occupiers who own outright. When focussing on IR as a means of old-age provision, our results for all three countries show an IR-related income advantage among the elderly. However, when decomposing income inequality by age groups, it is again only within the group of the elderly in Germany and the US that inequality is reduced by IR, while we find this effect to be reversed for the UK.

JEL Classification: D31, I31, R21

Keywords: Personal Income Distribution, Owner-occupied Housing, Imputed Rent, Old-age Provision

1 Introduction and Motivation

- Distribution of personal income
  - need to consider non-monetary income components
  - fictitious income advantage from owner occupied housing (Imputed Rent = IR)
    - Macro-Level: Recommendations by UN (1968/1977) as to include IR in National Accounts
    - Micro-Level: Claims by "The Canberra Group" (2001)

- What is the *overall* impact of IR on individual income positions and the personal income distribution as a whole ?
  - Is there a concentration of ownership in high income population → increase in inequality?
  - international experience
    - Smeeding et al. (1993): *leveling* effect on income distribution in Germany, Sweden, Canada, Netherlands
    - Meulemans / Cantillon (1993): income inequality *declines* in Belgium, especially among the *elderly*
    - Eurostat (1998): *poverty-reducing* effect in selected EU-countries
    - Yates (1994): income inequality *declines slightly* in Australia

2 Focus of Research

- IR and overall income inequality
  - Cross-national comparison for UK, West Germany, USA
  - Decomposition by housing tenure.
    Overall changes as a *net* effect of ...
    - increasing inequality between owner-occupiers and renters
    - inequality within the group of owners ???

- Home-ownership as a means of old age provision
  - "Ageing society" → pressure on the old age provision systems
    - IR and economic well-being after retirement
    - IR and income inequality over the life cycle

3 Alternative Methods to Determine Imputed Rent

- Recommendation by "The Canberra Group"

  - "If net imputed rent is included in income, one must be careful that it is measured in a way that leads to greater international standardization instead of nation-specific measures of its value"(Smeeding & Weinberg 2001:12)

  - Problem of adequate measurement of IR due to differences in the treatment of owner-specific costs
    - taxes on real property
    - maintenance costs
    - operating costs
    - depreciation
    - interest on mortgages
      - mortgage repayment = savings
      - interest = consumption

Overview: Selected Approaches to determine IR in Panel Surveys

Approach	Application	Idea	Evaluation of gross market value or rent, respectively	Deduction of relevant costs	Calculation	Problem
Capital Market	BHPS	IR = return on investment in real estate	Based on regional and county-level housing prices and home purchase costs asked from owners	Outstanding mortgage debt → *net* equity	IR = 6 % of net equity	Missing deduction of owner related costs
	PSID		Subjective estimate of market value by home owner	Outstanding credits → *net* equity		Subjective estimate of market value Missing deduction of owner related costs
Opportunity Cost	SOEP	IR = housing costs saved due to ownership	a) Regression of gross rent per square meter paid by main tenants in private housing market b) Applying regression coeffi-cients to otherwise comparable owner-occupiers → *gross* fictitious market rent	Owner-specific costs (operating, maintenance, interest on mortgages)	*net* value of IR	Not applicable for countries with low shares of main tenants in private housing market (like UK)

4 Data and Methods

- Data (CNEF – Cross-National-Equivalent File):
  - UK: BHPS 1993 /1998 (Capital-Market-Approach)
  - West Germany: SOEP 1993 / 1998 (Opportunity-Cost-Approach)
  - USA: PSID 1993 and 1997 (Capital-Market-Approach)

- *Population of interest*: individual in private household
  - Housing Tenure Status
    - Population in owner occupied housing
      - owned outright
      - on mortgage
    - Population in rental housing
  - Age of Household Head

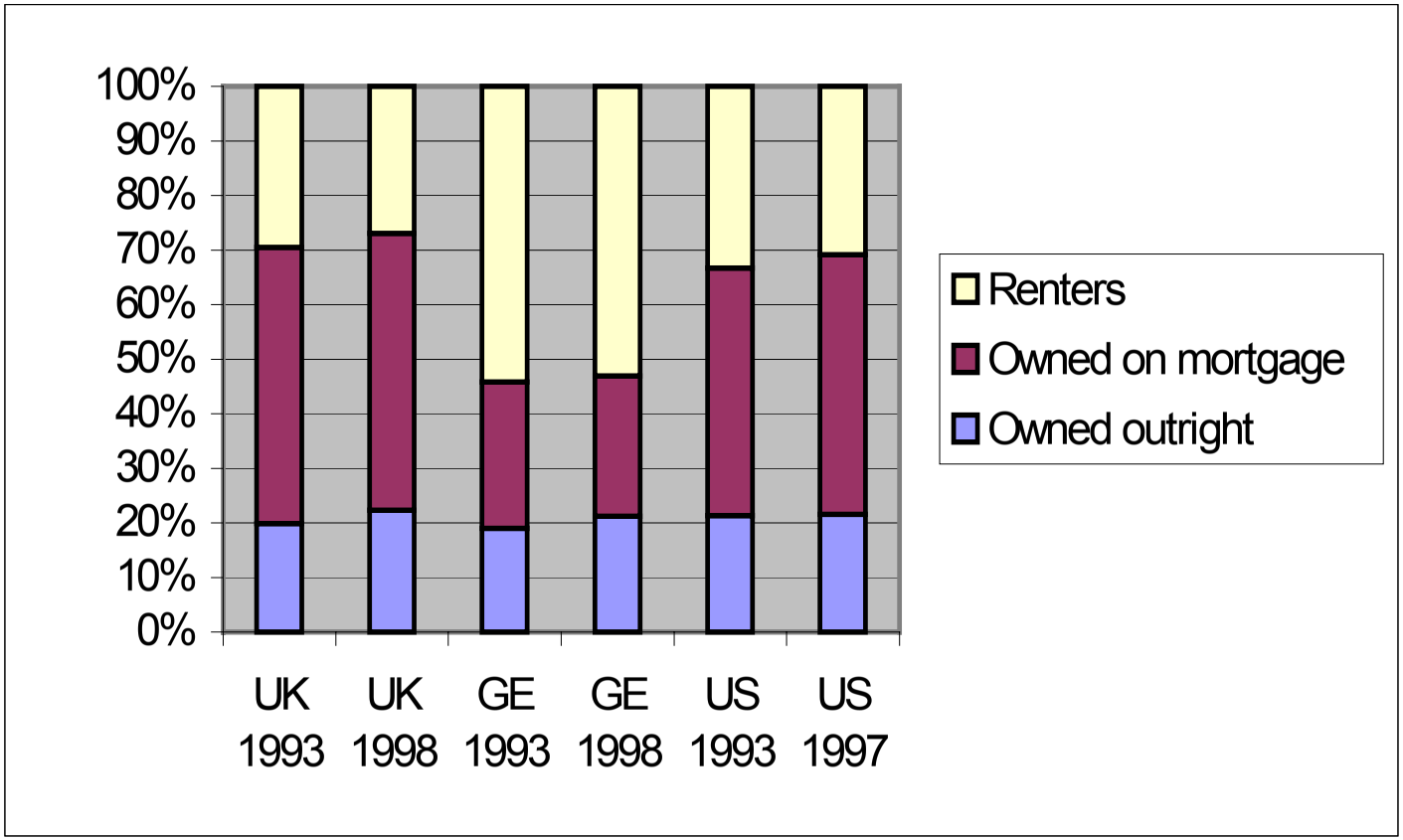
- *Income Definition*
  - Equivalent disposable household income as of the previous year
  - Equivalence scale with ε=0.5 (square root of HH size)

- *Measures*
  - Relative Income Positions (mean of total population = 100) for the ease of cross-national comparison
  - Relative Income Poverty
    (head count ratio; Poverty Line at 50% median)
  - Inequality (Gini, Decile Ratios, MLD)
  - Decomposition of MLD

- *Alternative income specification*
  - income *excluding* imputed rent (reference model)
  - income *including* imputed rent as given by the national data sets

5 Empirical Results in a cross-national context

Figure 1: Population in Private Households in the UK, West Germany and the USA by Housing Tenure Status



Source: BHPS, SOEP, PSID, CNEF; Authors' calculations.

Table 1: Imputed Rent and Relative Income Position in the UK, West-Germany and the USA by Housing Tenure Status

	UK				West-Germany				USA			
	1993		1998		1993		1998		1993		1997	
	Reference Model	Disposable Income incl. IR	Reference Model	Disposable Income incl. IR	Reference Model	Disposable Income incl. IR	Reference Model	Disposable Income incl. IR	Reference Model	Disposable Income incl. IR	Reference Model	Disposable Income incl. IR
	Relative Income Position in Reference Model (Total Population = 100) and absolute Change											
Total	**100**	+/-0	**100**	+/-0	**100**	+/-0	**100**	+/-0	**100**	+/-0	**100**	+/-0
Owner Occupiers, total	**113**	**+3**	**111**	**+2**	**111**	**+3**	**113**	**+4**	**113**	**+3**	**112**	**+3**
• Owned outright	103	**+14**	102	**+14**	100	**+8**	106	**+10**	91	**+9**	78	**+9**
• On mortgage	117	**-2**	114	**-2**	119	**-1**	119	**-1**	123	**+1**	128	**-1**
Renters	**69**	**-7**	**70**	**-8**	**91**	**-3**	**89**	**-4**	**74**	**-6**	**72**	**-5**

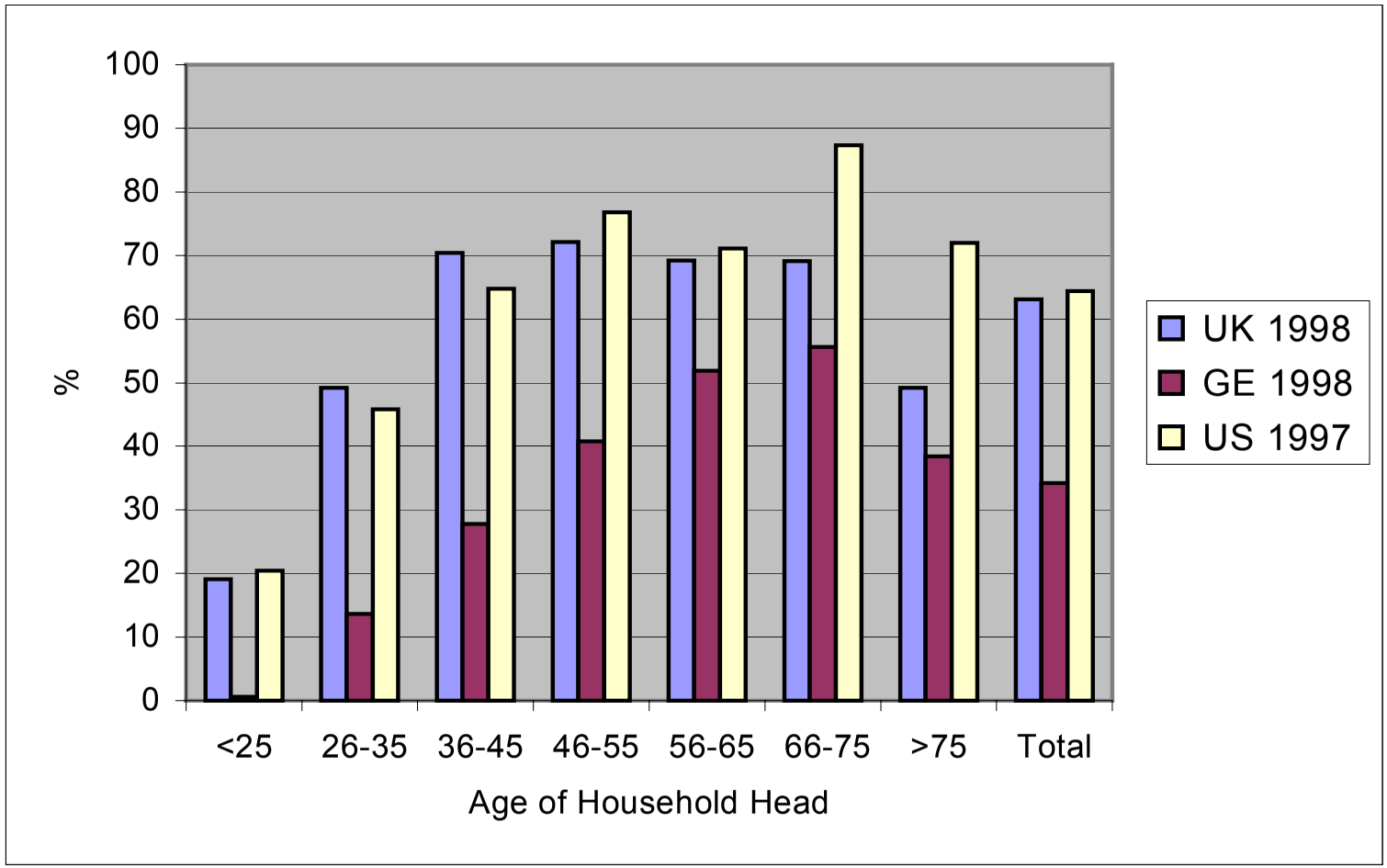
Source: BHPS, SOEP, CNEF; Authors‘ calculations.

Table 2: ***Imputed Rent and Decomposition of Income Inequality in the UK, West-Germany and the USA by Housing Tenure Status***

	UK				West Germany				USA			
	1993		1998		1993		1998		1993		1997	
	Reference Model	Income incl. IR	Reference Model	Income incl. IR	Reference Model	Income incl. IR	Reference Model	Income incl. IR	Reference Model	Income incl. IR	Reference Model	Income incl. IR
	Income Inequality in Reference Model and % change in inequality due to inclusion of IR											
Gini Coefficient	.2934	**0,4**	.2887	**0,7**	.2536	**-0,7**	.2525	**0,1**	.3363	**0,1**	.4020	**-2,4**
Decile Ratios												
• 90:10	4.49	**1,6**	4.18	**4,1**	3.32	**-0,3**	3.30	**-0,3**	5.59	**-2,7**	12.35	**-24,9**
• 90:50	1.93	**-0,5**	1.86	**1,1**	1.72	**0,0**	1.75	**1,1**	2.08	**-1,0**	2.29	**0,4**
• 50:10	2.33	**1,7**	2.24	**3,6**	1.93	**-0,5**	1.89	**-1,6**	2.68	**-1,5**	5.35	**-25,0**
Mean Log Deviation (MLD)	.1454	**2,3**	.1438	**1,9**	.1217	**-3,5**	.1184	**-1,4**	.2090	**-0,8**	.3973	**-13,9**
	Decomposition (MLD) in Reference Model and % change in group-specific inequality due to inclusion of IR											
Housing Tenure Status												
• Owned outright	.1328	**-23.0**	.1400	**-19.6**	.1472	**-18.5**	.1140	**-23.9**	.2155	**-14.4**	.5400	**-34.4**
• On mortgage	.1085	**-5.4**	.1067	**-5.2**	.1063	**-3.0**	.0868	**-3.6**	.1383	**-2.9**	.2541	**-14.8**
• Renters	.1338	.0	.1438	.0	.1081	.0	.1201	.0	.2236	.0	.4000	.0
	Between-group inequality as a % of total inequality											
Decomposition of MLD: Between-group	**16.99**	**24.93**	**13.77**	**21.57**	**5.42**	**7.16**	**6.93**	**11.14**	**12.25**	**15.72**	**9.16**	**11.48**

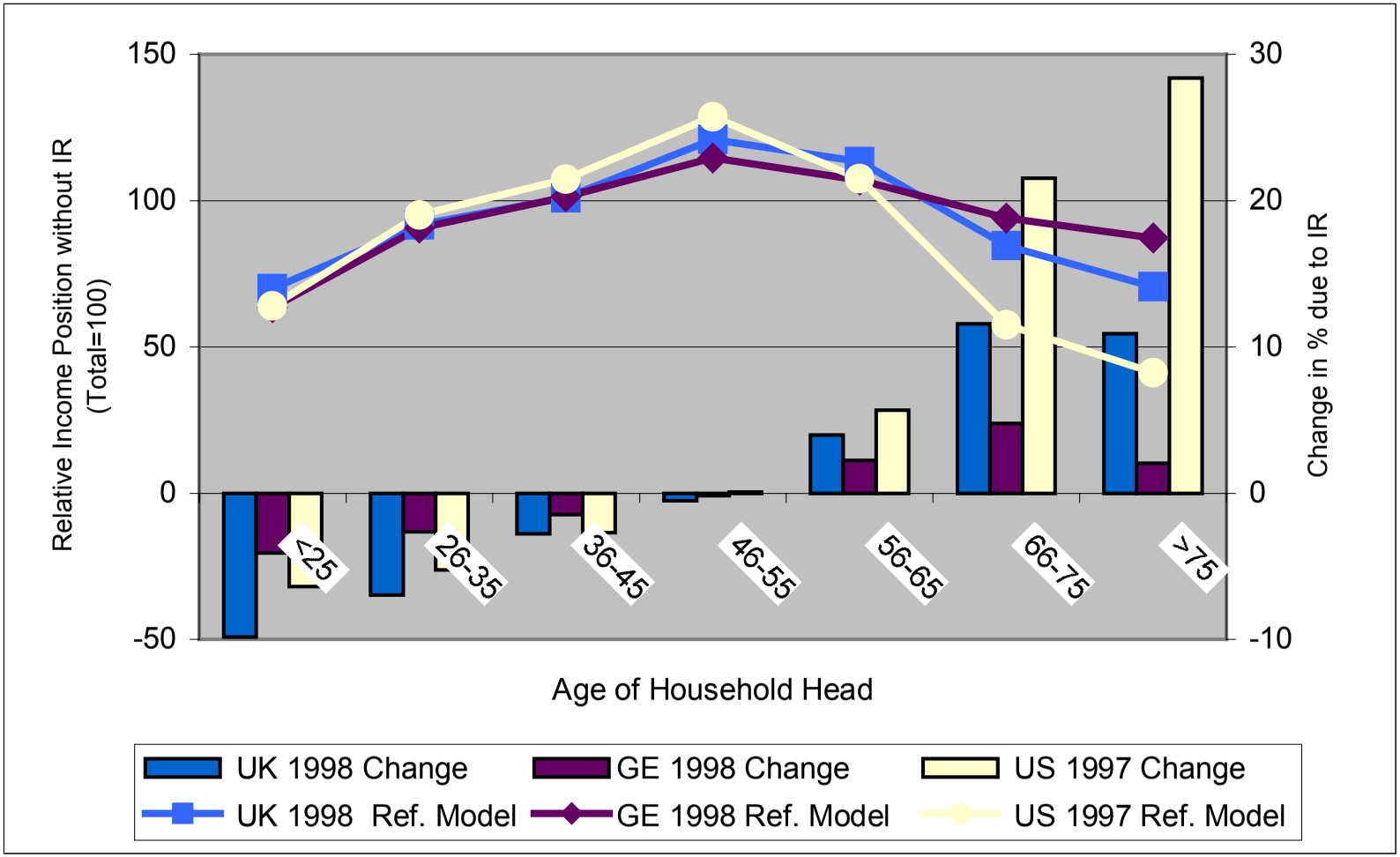
Source: BHPS, SOEP, PSID, CNEF; Authors' calculations.

Figure 2: Population Share with Positive Imputed Rental Value in UK, West Germany and the USA by Age of Household Head



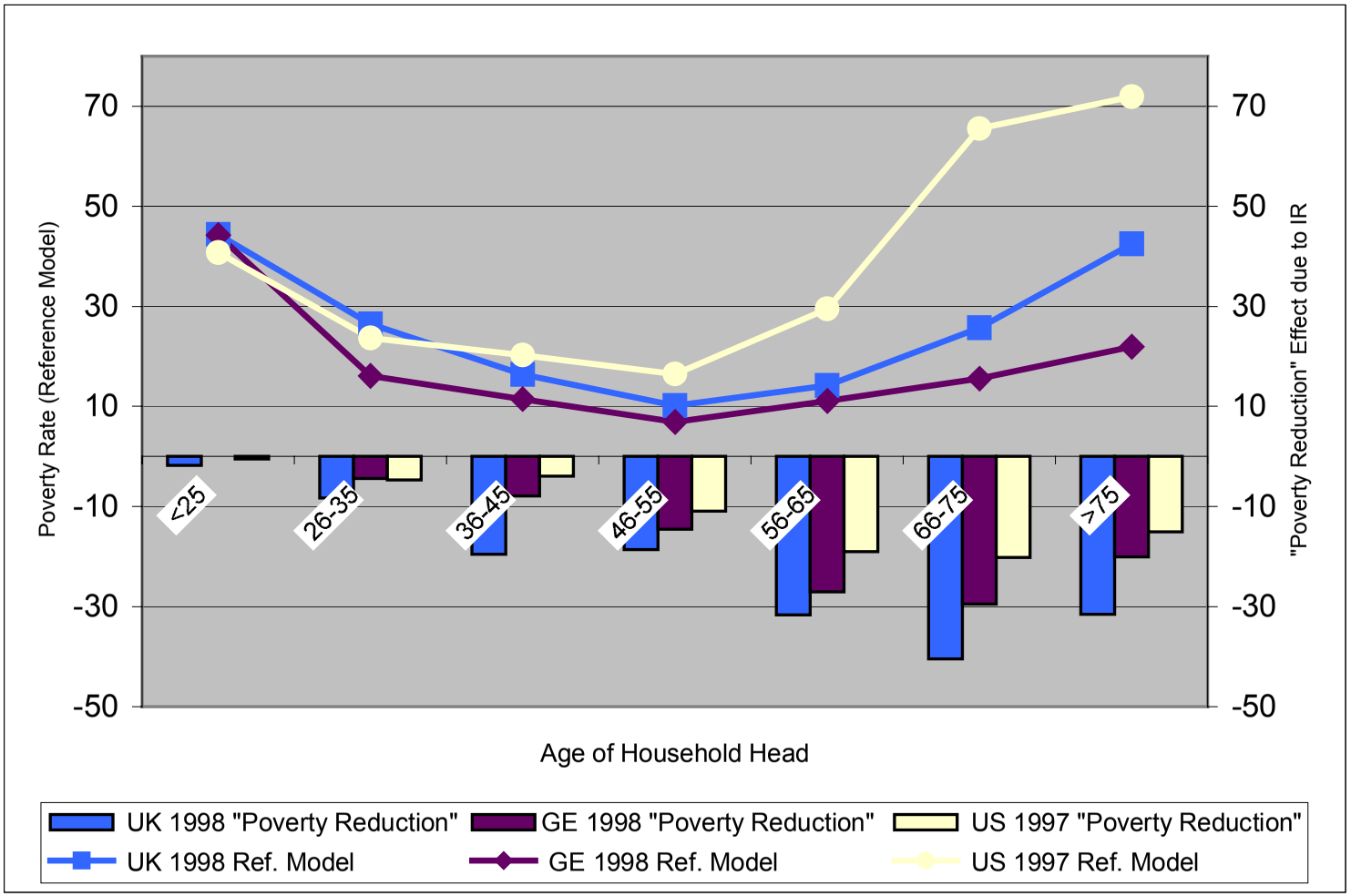
Source: BHPS, SOEP, PSID, CNEF; Authors' calculations.

Figure 3: Imputed Rent and Relative Income Position in UK, West Germany and the USA by Age of Household Head



Source: BHPS, SOEP, PSID, CNEF; Authors' calculations.

Figure 4: Imputed Rent and Relative Income Poverty in UK, West Germany and the USA by Age of Household Head



Source: BHPS, SOEP, PSID, CNEF; Authors' calculations.

Table 4: Imputed Rent and Decomposition of Income Inequality in the UK, West Germany and the USA by Age of Head of Household

	UK 1998		West Germany 1998		USA 1997	
	Reference Model	Income incl. IR	Reference Model	Income incl. IR	Reference Model	Income incl. IR
	Mean Log Deviation					
Total Population	.1438	1.9	.1184	-1.4	.3973	-13.9
	Decomposition (MLD) in Reference Model and % change in group-specific inequality due to inclusion of IR					
Age Group						
• <25	.1843	0.9	.2066	0.2	.2153	0.2
• 26-35	.1553	0.8	.1230	-2.4	.2907	-0.3
• 36-45	.1309	-2.5	.1136	1.0	.3009	-4.3
• 46-55	.1108	2.3	.0964	-7.3	.2729	-5.8
• 56-65	.1306	-3.3	.0979	-2.3	.4324	-12.1
• 66-75	.1131	10.5	.1065	-5.9	.7817	-35.4
• >75	.1222	22.8	.1191	3.5	.7647	-31.1
	Between-group inequality as a % of total inequality					
Decomposition of MLD: Between-group	9.32	9.01	5.57	6.43	9.15	7.95

Source: BHPS, SOEP, PSID, CNEF; Authors' calculations.

6 Summary and Recommendations

- IR and overall income inequality
  - UK: slight increase in inequality
  - USA and West Germany: decrease in income inequality (in line with the international literature)
  - Decomposition by housing tenure → Overall changes are *net* effect of conflicting changes in all three countries:
    - increasing inequality between owner-occupiers and renters
    - decreasing inequality within the group of outright owners

- IR as a means of old age provision
  - Decomposition by age of household head yields ...
    - increasing income inequality among the elderly in the UK
    - decreasing inequality for the elderly in the USA and West Germany
  - Considering IR in the measure of economic well-being ...
    - Improves relative income position
    - Lowers poverty risk

    ... for the elderly in all three countries

- Results support the claim of "The Canberra Croup" for a standardized definition of net IR (cross-national comparison)
    - Extension towards including: Social or company housing
    - Rent-free households (longitudinal analyses)

Appendix: *Equivalent Post-Government Income and Imputed Rent in the UK, West Germany and the USA*

	UK				**West Germany**				**USA**			
	1993		1998		1993		1998		1993		1997	
	Reference Model	Disposable Income incl. IR	Reference Model	Disposable Income incl. IR	Reference Model	Disposable Income incl. IR	Reference Model	Disposable Income incl. IR	Reference Model	Disposable Income incl. IR	Reference Model	Disposable Income incl. IR
	Mean Income in Current GBP (Mean Imputed Rent in Current GBP)				Mean Income in Current DEM (Mean Imputed Rent in Current DEM)				Mean Income in Current USD (Mean Imputed Rent in Current USD)]			
Total	9,491 (0)	10,575 (1,084)	11,488 (0)	12,894 (1,406)	30,787 (0)	31,646 (858)	33,409 (0)	34,892 (1,483)	20,140 (0)	21,780 (1,640)	21,987 (0)	23,796 (1,809)
Owner-occupiers, total	10,717 (0)	12,256 (1,539)	12,744 (0)	14,667 (1,923)	34,114 (0)	35,985 (1,870)	37,721 (0)	40,883 (3,162)	22,791 (0)	25,251 (2,460)	24,705 (0)	27,323 (2,618)
• Owned outright	9,754 (0)	12,404 (2,650)	11,807 (0)	15,055 (3,248)	30,696 (0)	34,127 (3,430)	35,253 (0)	40,495 (5,242)	18,403 (0)	21,734 (3,331)	17,149 (0)	20,676 (3,527)
• On mortgage	11,096 (0)	12,197 (1,101)	13,155 (0)	14,497 (1,342)	36,538 (0)	37,303 (764)	39,759 (0)	41,203 (1,443)	24,860 (0)	26,909 (2,049)	28,135 (0)	30,340 (2,205)
Renters, total	6,563 (0)		8,079 (0)		27,966 (0)		29,602 (0)		14,836 (0)		15,906 (0)	
Population share receiving IR (%)	*61.4*		*63.1*		*28.8*		*34.2*		*64.8*		*64.4*	
N	*12 212*		*11 865*		*11 710*		*11 156*		*14 480*		*10 657*	

Source: BHPS, SOEP, PSID, CNEF; Authors' calculations.