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The Economic Well-Being of Older People in International Perspective: A Critical Review

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The economic well-being of older people in international perspective: a critical review

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This paper surveys a dozen international comparative studies of poverty, income distribution and older people in industrialized countries using data up to the mid-1990s. It addresses a series of questions. At what level are the incomes of the elderly relative to the population as a whole? How has this changed over the past two decades? How many of the old are poor? How many of the poor are old? Are the oldest of the old poorer than younger pensioners are? The results show that the incomes of older people are typically around 80 per cent of incomes of the whole population. This ratio has been increasing over the past two decades in most countries. Although there remain pockets of poverty among the elderly, the old are generally represented proportionally or under-represented among the poor.

Industrialized countries have adopted a variety of retirement-income systems. How well do these different systems fare in ensuring that older people have the resources to maintain a decent standard of living? And how should we measure countries' success at achieving this goal?

The cross-national analysis of income distributions is a relatively recent research topic, and most studies in this area have focused on the distribution of income across the population as a whole. Nevertheless, it is possible to extract the results relevant to the economic position of older people. We draw on a dozen such studies, typically covering

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the early and mid-1990s, to attempt a 'meta-analysis' of the economic well-being of older people.

The following sections look in turn at three standard measures of economic well-being. Section 1 compares the average incomes of households comprising older people with those of the population as a whole ('average replacement rates'). Since averages can disguise a range of differences, we also disaggregate replacement rates for pensioners by sex, age and marital status. Section 2 concentrates on the bottom end of the income distribution. It asks: relative to standard poverty benchmarks, how many of the old are poor? The next section looks at inequality of pensioners' incomes. Section 4 considers how the relative incomes of older people have changed over time. Section 5 compares income-distribution outcomes and the features of retirement-income systems. Section 6 looks at broader concepts of command over resources beyond the standard measure of cash and near-cash incomes. In Section 7, we discuss the implications of these findings.

1. The relative incomes of older people

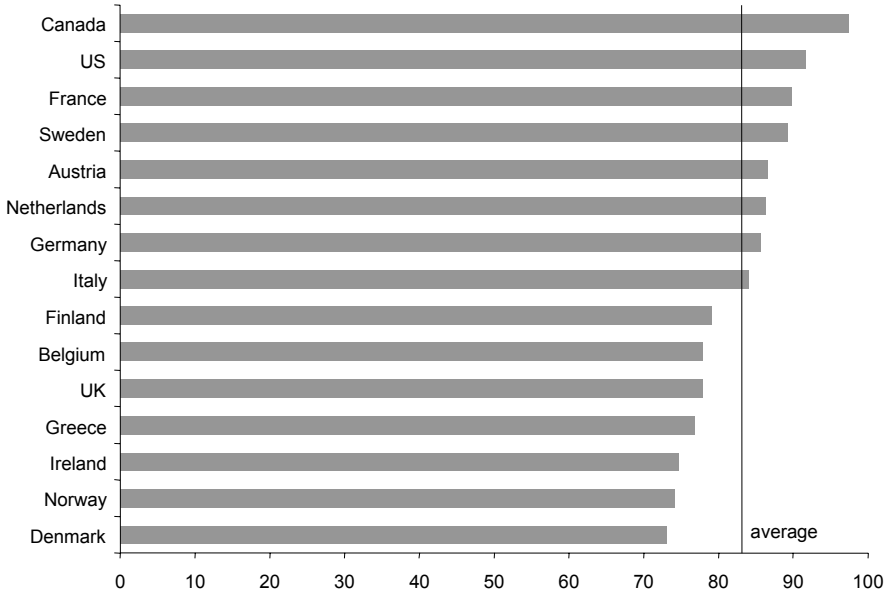
The simplest way of measuring the relative economic well-being of older people is to compare their average incomes with those of the population as a whole. Figure 1 shows the results of the latest income-distribution analysis compiled by the OECD (on the basis of contributions from national experts).

In this study, older people are defined as individuals over 65. Incomes are measured on a household basis. They are adjusted for household size using an 'equivalence scale'. Individual equivalent income is here defined as the household income divided by the square root of the number of household members. (See Buhmann *et al.*, 1988 and Atkinson, Rainwater and Smeeding, 1995 for a discussion of equivalization in a cross-national context.) Since older people tend to live in smaller households, this adjustment boosts the measured economic well-being of older people relative to the population as a whole. Income comprises earnings, public transfers, investment incomes, private pensions *etc.* It excludes capital gains and incomes in kind (from public provision of health care, for example).

Averaging across the 15 countries, older people's equivalent incomes are 83 per cent of those of the population as a whole. Interpreting this average is quite difficult for a number of reasons. For example, people no longer face the costs of work (commuting, special clothing *etc.*) when they are retired. A replacement rate of 100 per cent would

therefore probably reflect a sizeable increase in living standards relative to the working life. Younger pensioners may also derive utility from increased leisure time, particularly if the requirements of their pre-retirement job prevented them from adjusting working hours to optimize the trade-off between work and leisure. Increased leisure time also provides opportunities for home production (home improvement, cookery, gardening *etc.*) that might not have been possible before retirement. These additions to utility are not measured in conventional distributional studies.

Figure 1. **Pensioners' incomes as a percentage of population incomes in 15 countries**



Source: Förster and Pellizzari (2000), Table 2.3
Note: data are from 1994 and 1995 with the exception of Italy (1993); income is adjusted for household size by dividing by the square root of the number of household members

Another important issue is the pattern of marginal utility of income with age. For example, the very elderly may be unable to enjoy expensive leisure pursuits. However, they may have large health and care costs, which are not taken into account. Morbidity rates are much higher for older people than for the working-age population and the costs of disability are recognized in benefit systems. In the United Kingdom, for example, recipients of disability benefits are much less likely to be in the lowest quintile of the population income distribution (13 per cent) than pensioners as a whole (27 per cent), because of their extra benefit entitlement (Department of Social Security, 2000*b*, Table 7.5).

Nevertheless, it is not possible to adjust incomes for the extra cost of disability and so there is a danger in overstating the purchasing power of the disabled.

Turning to the pattern across countries, the replacement rate in this study is highest in North America (97 per cent in Canada and 92 per cent in the United States) and lowest in two Nordic countries (Denmark and Norway: 73 and 74 per cent). Other countries are bunched near to the average.

Comparing these results with other studies is hampered by a number of methodological and presentational differences: for example,

- The studies in Disney and Johnson (2001) disaggregate replacement rates by age, sex and marital status but do not present overall figures (nor are there population weights allowing one to derive the overall average); older people are defined as over 65s plus people aged 60-64 who are not in work;
- Hauser (1997) presents results divided by age; older people are defined by receipt of a pension benefit rather than age alone; the replacement rate is calculated relative to the incomes of households headed by someone under age 55;
- Disney, Mira d'Ercole and Scherer (1998) compare households where the head is aged *circa* 67 with households headed by people aged *circa* 55; they show results separately for single people and couples and do not use an equivalence scale.

Nevertheless, the two OECD-based studies — Burniaux *et al.* (1998) and Förster and Pellizzari (2000) — can be compared directly. They report very similar results: the correlation coefficient of replacement rates across the nine countries common to both studies is 0.98 and the means are similar. However, both correlate very weakly with the earlier results of Whiteford and Kennedy (1995).

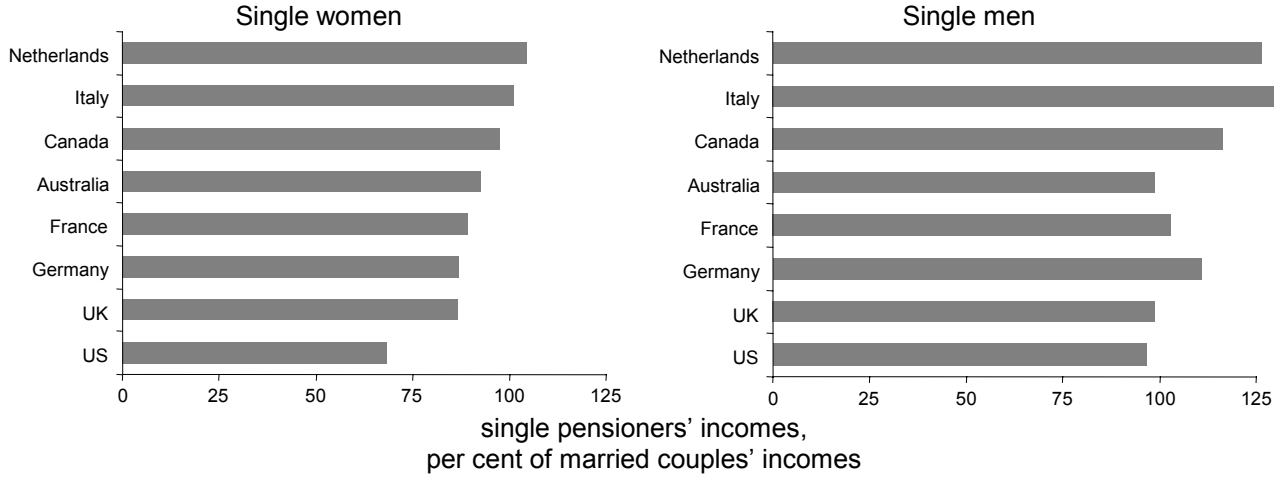
1.1 The effect of sex and marital status

Many studies differentiate results between different age groups and between single and married pensioners. These differences have obvious policy implications. For example, should the pension system pay more to older pensioners than to younger? What is the appropriate level of survivors' pensions relative to the pension paid to a couple?

Figure 2, based on Disney and Johnson (2001), splits the results by sex and compares single pensioners with married couples. Typically, single women's incomes are

lower than those (equivalized) of married couples. The exceptions are Italy and the Netherlands, a finding confirmed by Disney, Mira d'Ercole and Scherer (1998) and Hauser (1997). The latter also reports higher incomes for single women in Germany and Luxembourg. In contrast, single men typically fare better than married couples. The exceptions are Australia, the United Kingdom and the United States, but single men's incomes in these countries are only marginally lower (two to four per cent) than are married couples'.

Figure 2. **Single pensioners' incomes as a percentage of married couples' by sex in eight countries, equivalised**



Source: Disney and Johnson (2001), Table 1.13
Note: data are mainly from between 1995 and 1997, with the exceptions of Germany (1993) and the Netherlands (1993-94)

The results of replacement rates for married couples can be compared directly among three studies. The pair-wise correlation coefficients vary between 0.2 and 0.6 and none is statistically significant. Mean replacement rates also vary widely. Similarly, the results for the two studies that allow us to separate out the replacement rate for single pensioners provide unrelated results.

The most convincing explanation for the patterns of incomes by sex and marital status is the difference in structure of social-security (public-pension) benefits. For example, most continental European systems base the amount of social security wholly on contribution and earnings (see the descriptions of pension systems in section 5 below and in OECD, 2001 and Whitehouse, 2002*a*,*b*). A consequence is that the equivalized incomes for married couples in which one partner has an incomplete contribution history are lower

than for single pensioners. But the flat-benefit systems of Denmark, Ireland and the United Kingdom (and the means-tested system in Australia) pay a higher benefit to married couples where one partner (usually the wife in the case of these cohorts) has accumulated little or no pension rights of her own. This means that replacement rates for single pensioners are much closer to those of married couples than they are in other countries. Other features of retirement-income systems also have an effect on the pattern of incomes by sex and marital status.

1.2 Living arrangements

Disney and Johnson (2001) posit another explanation for the relatively low incomes of single women. Many single female pensioners, especially those with few pension rights of their own, live with other family members. Since the means tests for social-assistance benefits can depend on household incomes, these single women can have little if any entitlement to public transfers. They therefore often have little income of their own.

However, Disney and Johnson's results, uniquely among the studies surveyed, are not based on household incomes. Instead, they are based on 'family' or 'income' units, which consist of a single person or couple and any dependent children. An elderly couple living with a grown-up child and his or her spouse count as two units under this approach, and their incomes are treated separately. Results of measures of income inequality and poverty are quite sensitive to the choice of unit: typically, the smaller the unit of measurement, the larger is measured poverty and inequality. Goodman, Johnson and Webb (1997), for example, report that using the family unit in the United Kingdom would increase the proportion of the population with incomes below half the average by a third compared with household-based measures.

The effect will also vary between countries because of significant differences in the living arrangements of older people. Table 1 shows the proportions of the elderly living with their children. These are high in Japan and southern Europe and very low in the Nordic countries and the Netherlands. In most countries, there has been a substantial decline in co-residence over time. In the United Kingdom, for example, a third of the elderly lived with their children in the early 1960s, twice today's level.

Table 1. **Proportion of over 65s living with their children**

	per cent
Japan	65
Italy	39
Spain	30
Austria	25
France	17
United Kingdom	16
United States	15
Finland	14
Germany	14
Norway	11
Netherlands	8
Sweden	5
Denmark	4

Note: data for various years between 1987 and 1990
Source: OECD (1994)

OECD (2001) investigates the role of living arrangements in income-distribution outcomes in (its own words) a 'pseudo-simulation'. This illustrates what would happen if other countries were assumed to have the living arrangements of Japan or of Finland, keeping all other attributes of the population unchanged (Table 2). Although this is implausible (because living arrangements are highly correlated with other characteristics), it does illustrate the possible scale of effects. Using the example of the United Kingdom, the results show that original incomes would be 50 per cent higher if older people had the same living arrangements as in Japan and pensioners were presumed to share in the incomes of their adult children. After taxes and benefits are taken into account, average net income would increase by 20 per cent.

Table 2. **Differences in mean incomes when countries assumed to have the living arrangements of Japan and of Finland, 65-79 year olds, mid-1990s**

Changes, per cent	*Large households (Japan)*		*Small households (Finland)*	
	Original income	*After taxes and benefits*	*Original income*	*After taxes and benefits*
Canada	38	13	-11	-5
Finland	177	18	—	—
Germany	159	9	-3	0
Japan	—	—	-45	-18
Netherlands	8	-4	-2	-1
Sweden	16	3	-1	-1
United Kingdom	52	20	-5	-3
United States	25	7	-7	-4

Source: OECD (2001), Table 2.3

1.3 The effect of age

Figure 3 shows that pensioner incomes tend to decline with age, with the exceptions of Canada and Australia. Hauser (1997) also reports declining income by age for thirteen countries: the exception in his study is Luxembourg. In six countries — Denmark, France, Germany, the Netherlands, Portugal and the United Kingdom — the difference in replacement rates between 65-74 year olds and people over age 75 exceeds ten percentage points. There are many explanations for this pattern.

i) A cohort (date-of-birth) effect. When people reach pension age, their benefit is determined by their past earnings, which tend to be higher for younger cohorts, who have usually had higher real lifetime incomes than their predecessors.

ii) Incomplete indexation of past pension benefits to inflation (especially private pensions and annuities).

iii) Women live longer than men so older pensioners are disproportionately female. Older women tend to be poorer than older men are.

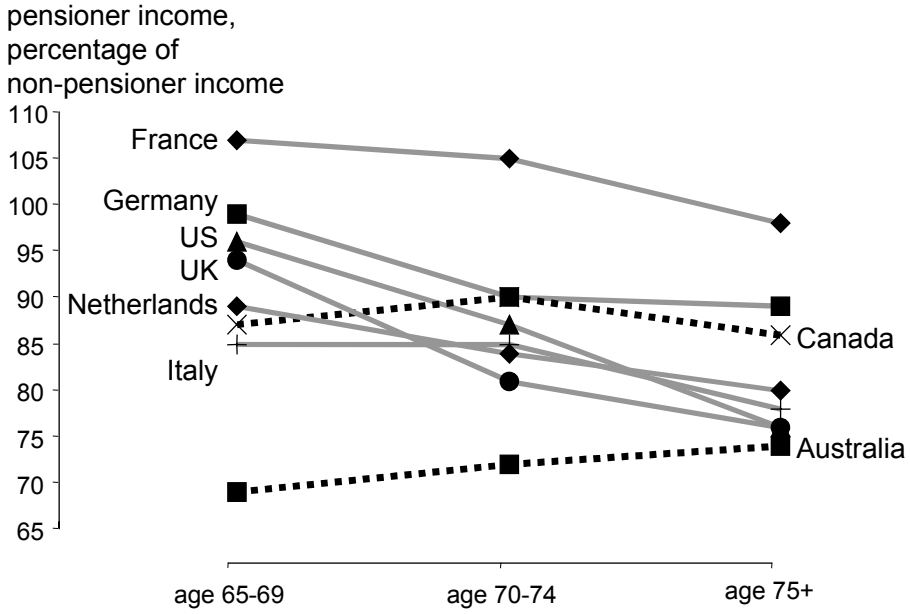
iv) Pension-scheme immaturity. Where schemes are contribution-based, earlier contributors may not have accumulated sufficient entitlements for a 'full' pension. The United Kingdom is one example. The second-tier, state earnings-related pension scheme (Serps) was only introduced in 1978. Benefits for successive cohorts of retirees peaked only in 1998 so only after twenty years or more will all pensioners have full, mature SERPS entitlements (for periods spent contracted in to the scheme).

v) The role of earnings among younger pensioners. According to the United Kingdom's Department of Social Security (2000*a*), earnings make up nearly 60 per cent of the difference in incomes between recently retired single pensioners and single over 75s. Nevertheless, only a small minority has income from earnings: 23 per cent of couples and 16 per cent of single pensioners among the recently retired and 15 per cent and 4 per cent respectively for pensioners of all ages. The pattern of average incomes by age is therefore distorted by a small number of younger elderly who are still working and are relatively well off.

vi) Decumulation of wealth. If older pensioners have spent down their assets — as the lifecycle hypothesis would imply — then they will have lower incomes from

capital than younger pensioners have. (Whether or how much this decumulation takes place is the subject of a long-running debate: see Disney, 1996 for a survey.)

Figure 3. **Pensioner incomes as a percentage of non-pensioner incomes by age in eight countries, couples**



Source: Johnson (1998), Table 4.2
Note: data are mainly from between 1995 and 1997, with the exceptions of Germany (1993) and the Netherlands (1993-94)

However, there is one counteracting factor: differential mortality of pensioners across income groups. Survivors to old ages will typically have greater financial, housing and pension wealth than pensioners who die young will. This composition effect means that older pensioners will tend to be the richer of their cohort. Following pensioner incomes across time allows some of the cohort effect to be disentangled from the age effect. Johnson and Stears (1995) find that the average income of each cohort in the United Kingdom increases over time. Differential mortality offsets clear evidence of cohort effects, under-indexation of pension benefits and decumulation of assets.

Australia has the reverse pattern to other countries: older pensioners are richer than younger ones. This probably stems from two unique features of the Australian retirement-income system (on which see Bateman, Kingston and Piggott, 2001). First, most private pension benefits are paid as lump sums. Such lump sums are not counted as income (see section 6). Secondly, the age pension (the public pension benefit) is both

income- and asset-tested. This encourages people to dissipate private-pension assets into housing, consumer durables *etc.*, which do not reduce the age-pension entitlement.

The following tables examine pair-wise the correlation of replacement rate rankings across countries for studies that divide replacement rates by age group. There is a further split because Hauser reports results using 'old'- and 'new-OECD' equivalence scales (in his terminology). The first line in each cell shows the correlation coefficient between the replacement rates reported for each overlapping country in the relevant two studies. The significance level, from a standard test, is reported in parentheses. The second line in each cell reports the mean respective replacement rate in the two studies that are compared. The third line reports the number of countries that the two relevant studies have in common. (Note that the means reported in each case are calculated only for the countries that the two relevant studies have in common.) The final line shows the results for the United States.

Comparing the two results from Hauser, the results are highly correlated between countries but the mean replacement rate shifts substantially. The correlations between the OECD studies for the 65-74 age group (Table 3) are fairly close, but there is much greater disparity in the findings of the five studies in Table 4 for older pensioners. Although the means are similar, the correlations are lower, indicating that the rankings of countries by average replacement rates vary significantly across countries.

Table 3. **Comparison matrix for replacement rates: age 65-74, four studies**

	Hauser (old scale)	Hauser (new scale)	Whiteford/Kennedy
Förster/ Pellizzarri	Correlation: 0.76 (0.01) Means: 87,92 Observations: 11 US: 99,101	Correlation: 0.80 (0.01) Means: 88,86 Observations: 10 US: 99,95	Correlation: 0.78 (0.01) Means: 89,94 Observations: 10 US: 99,105
Hauser (old scale)		Correlation: 0.99 (0.00) Means: 93,86 Observations: 12 US: 101,95	Correlation: 0.78 (0.01) Means: 95,96 Observations: 9 US: 101,105
Hauser (new scale)			Correlation: 0.79 (0.01) Means: 88,97 Observations: 9 US: 95,105

Table 4. **Comparison matrix for replacement rates: age 75 plus, five studies**

	Hauser (old scale)	Hauser (new scale)	Disney/Johnson	Whiteford/Kennedy
Förster/ Pellizzari	Correlation: 0.53 (0.10) Means: 71,98 Observations: 11 US: 82,98	Correlation: 0.55 (0.09) Means: 78,77 Observations: 10 US: 82,90	Correlation: 0.24 (0.60) Means: 82,82 Observations: 7 US: 82,83	Correlation: 0.13 (0.74) Means: 80,86 Observations: 9 US: 82,82
Hauser (old scale)		Correlation: 0.99 (0.00) Means: 87,78 Observations: 12 US: 98,90	Correlation: 0.40 (0.45) Means: 87,82 Observations: 7 US: 98,83	Correlation: 0.41 (0.35) Means: 88,89 Observations: 9 US: 98,82
Hauser (new scale)			Correlation: 0.35 (0.38) Means: 79,82 Observations: 7 US: 90,83	Correlation: 0.35 (0.26) Means: 79,89 Observations: 9 US: 90,82
Disney/ Johnson				Correlation: 0.74 (0.04) Means: 81,87 Observations: 8 US: 83,82

2. Income-poverty rates

There are two basic approaches to defining income-poverty:

- An absolute standard: either the resources to meet basic needs or to reach the safety-net income specified by the social-assistance system; and
- A relative standard, where poverty is defined in comparison with the living standards of society as a whole.

Over the long term, governments have tended to increase the safety-net level of income faster than prices, implying that societies' (or at least governments') views of poverty change over time. Absolute poverty standards are problematic for international comparisons since:

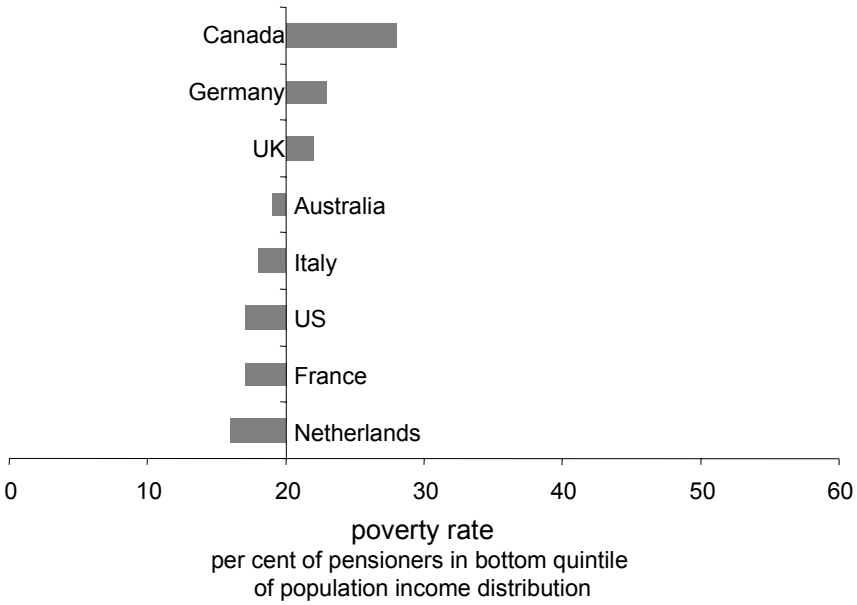
- Basic needs differ between countries;
- The poverty line must be translated into different currencies. Market currency rates are very volatile and even purchasing power parities — which compare the cost of a common consumption basket — are inappropriate, because they aim to equalize the cost of total domestic expenditure and not the consumption of the poor; and
- Countries' average incomes differ. For example, poverty rates measured against a threshold of 50 per cent of average consumption across the European Union varied

from under five per cent in Belgium, Denmark and the Netherlands to nearly 70 per cent in Portugal (Eurostat, 1990).

The most common measure of poverty in international studies is therefore the proportion of the population with incomes below some ratio of the average (mean or median) income. Two of the studies surveyed here define poor older people as those in the bottom fifth of the overall income distribution (a definition which obviously makes no sense when comparing aggregate poverty rates).

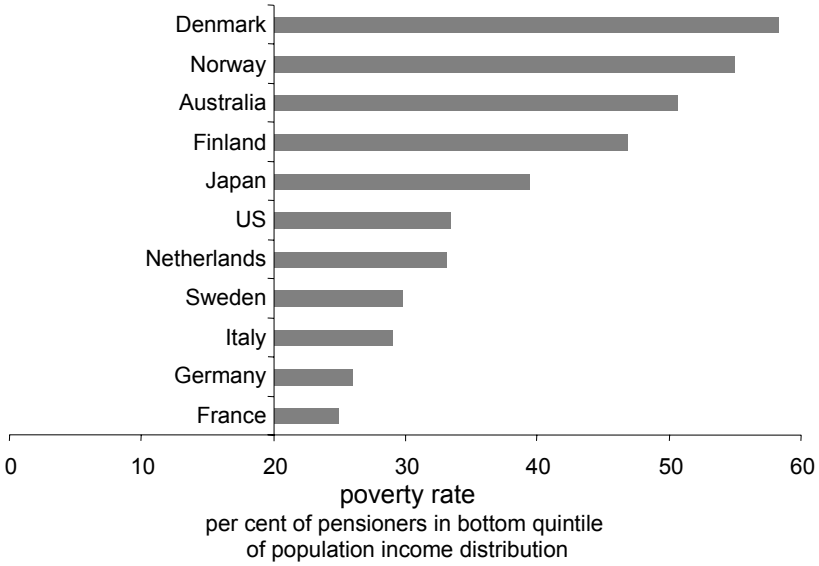
Figure 4 shows the results from one of these (Johnson, 1998). The intercept of the chart is drawn at 20 per cent, so that bars to the right imply that older people are over-represented among the poor and to the left, that they are under-represented. In most countries, the proportion of older people in the bottom quintile of incomes is close to the 'neutral' level of 20 per cent. Canada shows the highest degree of over-representation. In five countries, however, fewer than one in five pensioners are in the bottom quintile of the population income distribution.

Figure 4. **Pensioner income-poverty rates in eight OECD countries: percentage of elderly in the bottom quintile of the population income distribution**



Source: Johnson (1998), Table A1
Note: uses an equivalence scale of one plus 0.7 per additional adult in an income unit and 0.5 per additional child. Pensioner income units are defined as all family units headed by someone over 65 or someone aged 60-64 who is not working. Data are mainly from between 1995 and 1997, with the exceptions of Germany (1993) and the Netherlands (1993-94)

Figure 5. **Pensioner income-poverty rates in 11 OECD countries: percentage of elderly in the bottom quintile of the population income distribution**



Source: Burniaux *et al.* (1998), Table 5.3

Note: data are from 1993 to 1995 with the exception of France (1990)

Figure 5, drawn from an OECD study, shows that older people are over-represented in the bottom quintile of the income distribution in all 11 countries. Most striking is the difference between the results for Australia and the extremely high poverty rates reported for the Nordic countries — Denmark, Finland and Norway — which typically show high replacement rates for older people. (Note that we are unable to rationalize these results and communications with the authors have not elicited an explanation.)

One possible explanation is the Nordic countries' relatively egalitarian distribution of income among the population as a whole compared, for example, with the United States. The ratio of the value of the twentieth percentile of the income distribution to the median and the mean income in some example countries (from Förster and Pellizzari, 2000, Table 2.2) illustrates these differences.

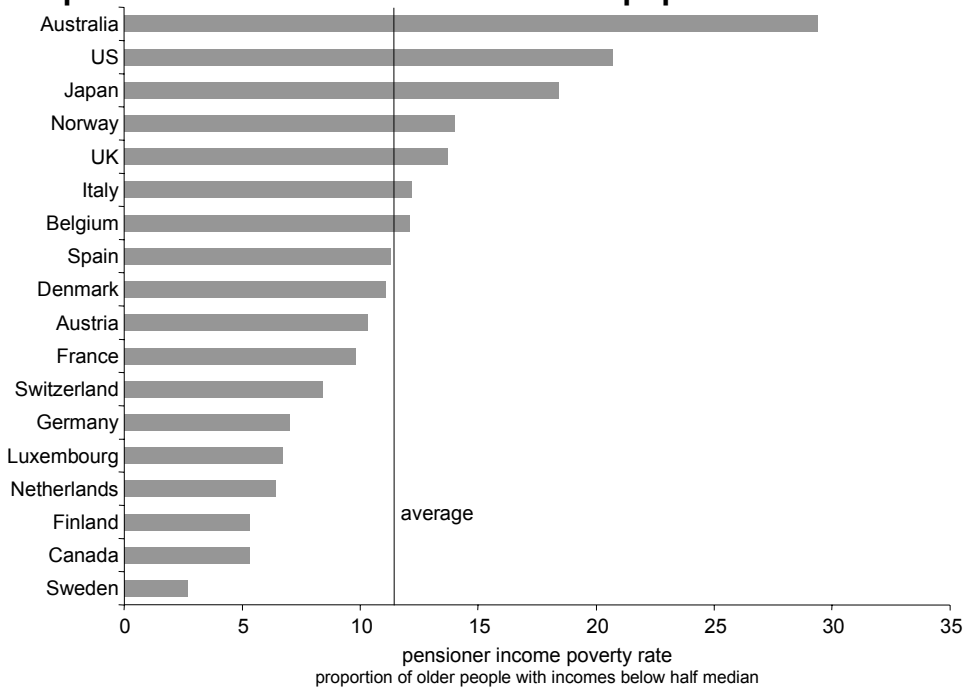
	Sweden	United Kingdom	United States
P20/median	68%	61%	53%
P20/mean	62%	51%	43%

Therefore, while many more pensioners in Denmark (which has a similar income distribution to Sweden) are found in the bottom quintile of the income distribution, their incomes will be higher as a proportion of the population average than low-income pensioners in the United States.

Comparing the data in Figure 5 with Figure 4, the correlation coefficient is –0.08. Measured income poverty rates for the six common countries are completely unrelated between these two studies (which use the bottom quintile of the overall income distribution as a measure of income poverty).

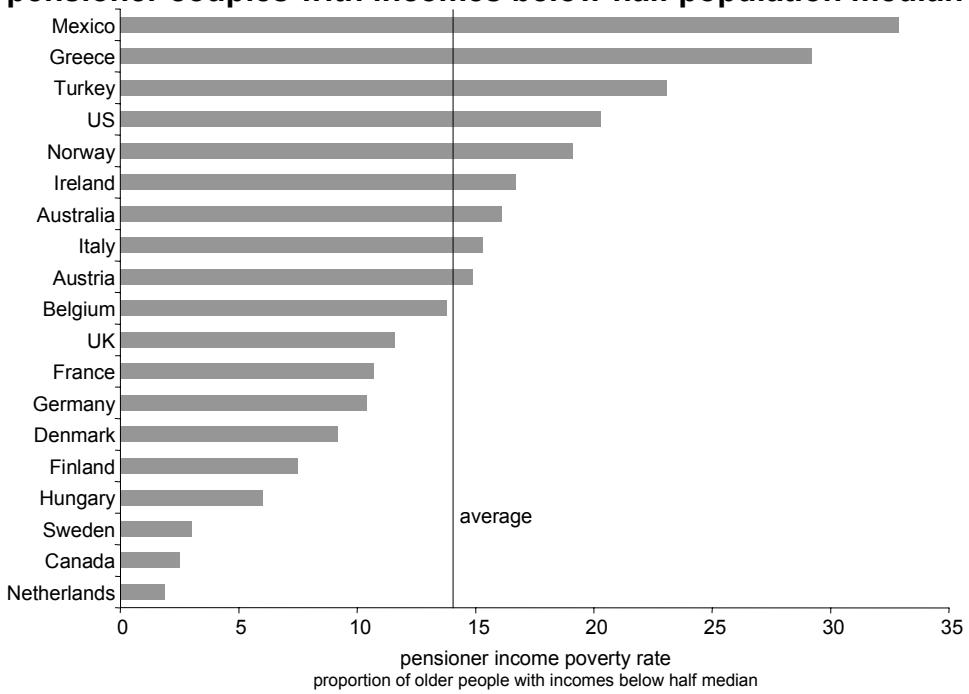
The remaining studies define income poverty as having an income below half of the population average income. This measure is more robust with respect to changes in the shape of the overall income distribution than the bottom-quintile measure. For example, a higher proportion in the bottom quintile of a more equal income distribution might generate higher measured poverty. However, this might mean that pensioners are relatively better off than their counterparts in a country with a more dispersed distribution of income. The final difference is in the average of population income that is used. Hauser (1997) employs the mean while the other studies use the median. Use of the mean, of course, leaves the results vulnerable to the effect of outliers and measurement error. It also produces a higher threshold in those countries with a more dispersed overall income distribution.

Figure 6. **Pensioner income-poverty rates in 18 countries: percentage of pensioners with incomes below half population median**



Source: Smeeding and Williamson (2001), Table 1
Note data are from 1994 and 1995, with the exceptions of Canada and the United States (1997), Belgium, Japan, Switzerland, Denmark (1992) and Spain (1990)

Figure 7. **Pensioner income-poverty rates in 19 countries: percentage of pensioner couples with incomes below half population median**



Source: Förster and Pellizzari (2000), Table 5.4
Note: data are from 1994 and 1995, with the exception of Austria and Italy (1993) and Hungary (1997)

Figure 6 is based on the latest published analysis of the Luxembourg Income Study database. Averaging across the 18 countries shown, 11.4 per cent of older people have incomes below half the median. The income-poverty rate varies from less than three per cent in Sweden to nearly 30 per cent in Australia.

Figure 7 uses the results of the latest OECD study of income distribution. The average income-poverty rate in this case is 13.9 per cent. These two studies produce quite similar results. The correlation between these two sets of results is close (0.76, significance level 0.00: see Table 5). The largest difference is in the poverty rate for Australia, which is reported as 16.1 per cent by Förster and Pellizzari and 29.4 per cent by Smeeding and Williamson.

An income-poverty threshold of half-average income has become something of a standard, but the relative position of different countries can be sensitive to the choice of poverty line. Many studies, recognizing this, provide results with different cut-off points. Comparison of these analyses is unfortunately hampered by the use of different thresholds: for example,

- Smeeding and Williamson (2001) use 40 and 50 per cent;
- Atkinson, Rainwater and Smeeding (1995) use 50 and 70 per cent; and
- Hauser (1997) and Whiteford and Kennedy (1995) use 40, 50 and 60 per cent.

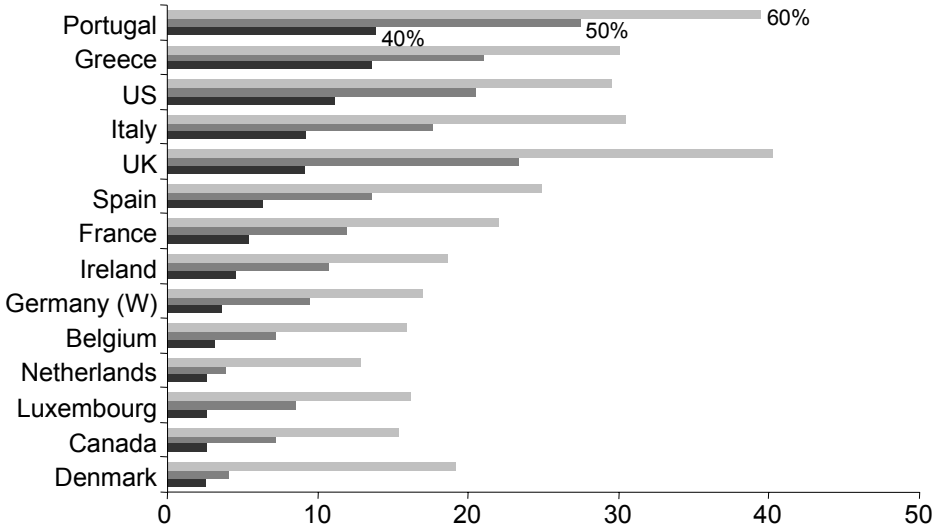
We use Hauser's results as an illustration (Figure 8). Naturally, a higher threshold increases measured poverty. An average of six per cent of pensioners have incomes under 40 per cent of the population average, 13 per cent are under the 50-per-cent threshold and 24 per cent count as poor with a 60-per-cent poverty line. Note that countries are ranked in the chart by their poverty rates with a 40-per-cent cut-off.

There are some re-rankings in countries' relative poverty rates with different poverty lines. In the United Kingdom, nine per cent of pensioners have incomes below 40 per cent of average, the fifth highest proportion. However, with a 60-per-cent threshold, the United Kingdom has the highest measured elderly poverty rate (at 40 per cent). Similarly, Denmark has the second lowest poverty rate with the lowest threshold but moves up six places with the highest poverty line. Conversely, the United States has the third highest poverty rate with a 40-per-cent threshold, falling to fourth highest (50 per cent) and fifth highest (60 per cent). Whiteford and Kennedy (1995) report similar results, again using data from the Luxembourg Income Study. The United Kingdom has the third

and fourth lowest pensioner poverty rate with a cut-off of 40 and 50 per cent respectively. However, if poverty is defined as an income below 60 per cent of the average, then the United Kingdom slips to eighth place.

The overall sensitivity of the results to the choice of poverty line can be quite small. In Hauser's study, for example, the correlation coefficients between results at the three different thresholds vary between 0.88 and 0.98, with significance levels of zero to four decimal places. Whiteford and Kennedy's results give correlation coefficients of between 0.51 and 0.91, implying a significant difference between the 40 and 60 per cent thresholds (p=0.1050). An alternative approach is to use different poverty measures that are less sensitive to the choice of threshold. Examples include the 'poverty index' — the poverty rate multiplied by the mean shortfall of incomes from the poverty line — and the general class of measures that also take account of the degree of inequality among the poor (Foster, Greer and Thorbecke, 1984).

Figure 8. **Pensioner income poverty rates in 14 countries: proportion of pensioners with incomes below specified proportions of population mean**



Source: Hauser (1997), Table 7
Note data are from between 1989 and 1992, with the exception of Greece (1987-88)

Finally, Table 5 compares the cross-country correlations of poverty rankings over pair-wise comparisons for the six studies that define poverty as having an income below half the average that were presented in the charts above. Five of these analyses are based on the Luxembourg Income Study, the exception being Förster and Pellizzari (2000).

In general, the six papers give similar results. The correlation coefficients for poverty rate rankings across countries are positive and relatively high: some are significant on standard tests. Moreover, mean poverty rates in the countries that change rankings tend to be similar. The income-poverty rate in the United States lies between 20.3 and 25.3 per cent in different studies, but other countries show much more variation.

Most significant is the United Kingdom. Atkinson, Rainwater and Smeeding and Whiteford and Kennedy report one of the lowest poverty rates for the United Kingdom: the third and fourth lowest respectively (at seven and eight per cent). In contrast, Bradshaw and Chen and Hauser suggest a very high poverty rate among British pensioners (36 and 23 per cent respectively). In the former case, we suspect that the main reason for this result is the exclusion of housing benefit from the measure of income. (The authors are not transparent, but they state on page four: 'Excluded from consideration here are the impacts of housing benefits and subsidies…') This treatment is unique to the Bradshaw-Chen study; all the other papers surveyed define income as all cash income and 'near-cash' income, where the latter specifically includes, for example, housing benefit in the United Kingdom and food stamps in the United States. Given the importance of housing benefits to poorer pensioners in the United Kingdom — some 17 per cent of all pensioners receive the benefit — it is unsurprising that this treatment has a significant effect on measured poverty rates.

The main idiosyncrasy of the Hauser paper is in the definition of a pensioner: all members (irrespective of their own age) of households headed by someone aged 55 or over in which one or more member receives a pension. The other studies simply count people as elderly using a standard cut-off age and do not count other members of households that contain a pensioner. There are many different effects of this treatment and so it is difficult to isolate which might be responsible for the rather different result for the United Kingdom.

There are two other countries where there are substantial differences between the studies. For Australia, Atkinson, Rainwater and Smeeding and Förster and Pellizzari find percentage poverty rates in the high teens, while the other three papers that cover Australia report figures of around 30 per cent. The reported income-poverty rate for Norway varies between 7 and 19 per cent in four studies.

Table 5. **Comparison matrix for poverty rates: proportion of pensioners with incomes below half average**

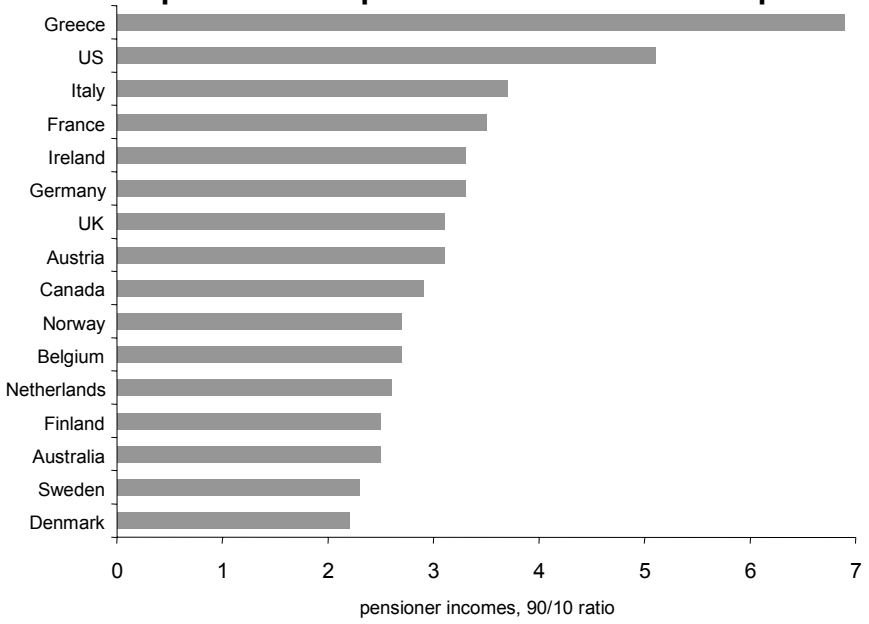
	Bradshaw/Chen	Förster/Pellizzari	Hauser	Smeeding/Williamson	Whiteford/Kennedy
Atkinson *et al.*	Correlation: 0.30 (0.37) Means: 11, 15 Observations: 11 US: 21,25	Correlation: 0.71 (0.00) Means: 11,11 Observations: 13 US: 21,20	Correlation: 0.49 (0.15) Means: 10,12 Observations: 10 US: 21,21	Correlation: 0.72 (0.01) Means: 11, 11 Observations: 13 US: 21,21	Correlation: 0.94 (0.00) Means: 11,12 Observations: 11 US: 21,25
Bradshaw/ Chen		Correlation: 0.46 (0.13) Means: 14,11 Observations: 12 US: 25,20	Correlation: 0.64 (0.05) Means: 15,13 Observations: 10 US: 25,21	Correlation: 0.69 (0.01) Means: 14, 12 Observations: 13 US: 25,21	Correlation: 0.56 (0.12) Means: 16,13 Observations: 9 US: 25,25
Förster/ Pellizzari			Correlation: 0.69 (0.02) Means: 13,12 Observations: 11 US: 20,21	Correlation: 0.76 (0.00) Means: 11,2 Observations: 13 US: 20,21	Correlation: 0.74 (0.01) Means: 11,12 Observations: 10 US: 20,25
Hauser				Correlation: 0.71 (0.01) Means: 12,11 Observations: 11 US: 21,21	Correlation: 0.52 (0.15) Means: 12,11 Observations: 9 US: 21,25
Smeeding/ Williamson					Correlation: 0.87 (0.00) Means: 12,12 Observations: 11 US: 21,25

3. Income inequality

The two previous sections looked at how pensioners' incomes compare with those of the population as whole. This section focuses on the distribution of income among older people.

Figure 9 shows (from the most recent OECD study) a simple measure of income inequality: the ratio of the 90th percentile of the pensioner income distribution to the 10th percentile, called the 90/10 ratio for short. The differences between countries are very large. In the United States, for example, the richest pensioners have incomes more than five times larger than the poorest pensioners, while the ratio is two-and-a-half or less in Australia, the Nordic countries and the low countries (Belgium and the Netherlands). These results are confirmed by Johnson (1998): in the eight countries also covered by the OECD study, the correlation between the results is near perfect (0.99, significance level 0.0000).

Figure 9. **Pensioner income inequality in 16 countries: ratio of 90th percentile of pensioner income to 10th percentile**

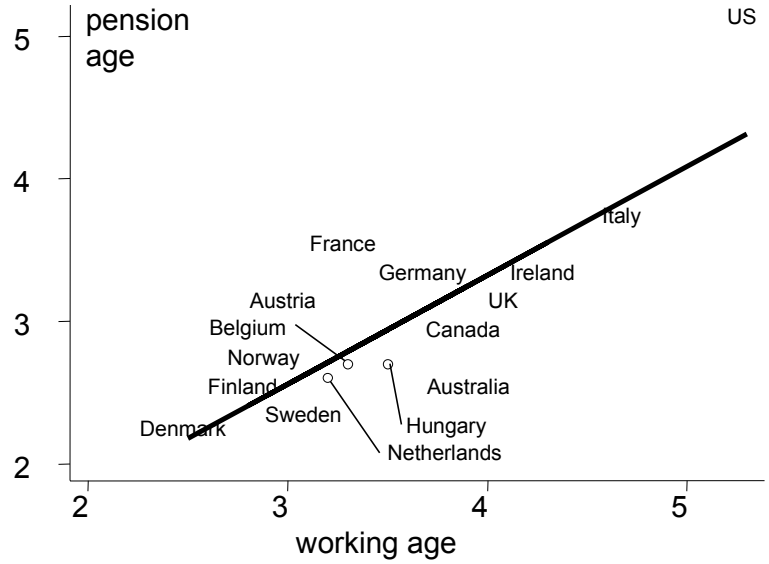


Source: Förster and Pellizzari (2000), Table 2.2
Note: the data are from 1994 and 1995, with the exception of Italy (1993)

A natural conclusion from Figure 9 is that the dispersion of earnings and incomes among people during their working life is continued into retirement. This issue is explored in Figure 10, which plots inequality among older people against inequality among people of

working age, again using the simple 90/10 ratio as the inequality measure. Fitted values are also shown. On average, pensioner incomes are less unequal than workers' incomes (mean 90/10 ratios are three and three-and-a-half respectively). There is, as expected, a very strong relationship between income inequality at working and pension age. At one end of the spectrum, both workers and pensioners have very unequal incomes in the United States while the Nordic countries are more egalitarian in both cases.

Figure 10. **Income inequality among pension-age and working-age populations in 16 countries: ratio of 90th to 10th percentile of income**



Source: Förster and Pellizzari (2000), Table 2.2
Note: the data are from 1994 and 1995, with the exception of Italy (1993). Fitted values are estimated from pension-age ratio = 0.9874 + 0.8655 working-age ratio; standard errors 0.5568 and 0.1803 respectively

A second explanation for the pattern of pensioner income inequality lies in the structure of pension systems. We would expect redistributive pension systems to result in a relatively egalitarian distribution of pensioner income compared with systems of comprehensive social insurance. An example of the former is the means-tested age pension in Australia. The 9010/ratio for people of working age is the fifth highest in Australia (at 3.9), while the ratio for people of pension age is the fourth lowest (2.5). Similarly, Canada, the Netherlands and the United Kingdom pay mainly flat-rate public pension benefits. The 90/10 ratios for pensioners are lower than we would expect given the distribution of income among workers (since they lie below the fitted-value curve).

They are also lower than in Italy and France, which have comprehensive earnings-related public pensions paying larger benefits to higher earners.

Johnson (1998) also produces 90/10 ratios separately by sex, marital status and age. Typically, the incomes of single men are the most broadly distributed — with the exceptions of Australia and the United Kingdom, where couples' incomes are the most dispersed — but the differences are not large. The pattern is also similar for different age groups. The only exceptions here are Italy, with a large decline in the 90/10 ratio with age, and the United Kingdom, with a modest fall. Johnson also analyses 60-64 year olds who are not in work. This age group has vastly more unequal incomes than people over pension age in Canada and the United States. This tends to suggest that there are 'two nations' of early retirees: those forced to retire on low incomes because of illness or redundancy and those with generous private pensions and early retirement benefits.

These results are a useful complement to the earlier measures. Some countries with low 90/10 ratios often have lower average pensioner replacement rates. This implies that much of the cross-country differences in the average living standard of pensioners are generated by the incomes of a small number of richer pensioners rather than by the incomes of the majority.

4. Income trends

The previous sections provide 'snapshots' of pensioners' incomes across countries in a single year. We can extend the analysis to look at how these patterns have changed over time. Förster and Pellizzari (2000) provide a broad analysis of the trend in the relative incomes of older people. The data compare the mid-1990s with the mid-1980s. Table 7 gives the results as the percentage change in the replacement rate over the decade or so. Pensioners' incomes increased faster than the whole population's did in nine of the 13 countries. The mean change is a two per cent increase in the replacement rate. Older people in Canada, France, Germany and the United Kingdom enjoyed large gains, with increases of over five per cent in the replacement rate. The sizeable decline in pensioners' relative incomes in Ireland is probably a reflection of the rapid growth of the economy, which has seen large increases in earnings.

Income changes in virtually all the countries vary significantly between 'younger' and 'older' pensioners. In nine of the 13 nations, gains are larger for pensioners aged 65-74 than for the over 75s; in several countries significantly so. This may arise from the growth

of private pension benefits, real wage growth (affecting incremental replacement rates) and other cohort effects.

Table 7. **Percentage change in replacement rate by age group between the mid-1980s and the mid-1990s in 13 countries**

	Change in replacement rate (%)		
	All	*Age 65-74*	*Age 75-*
Canada	6.0	8.5	0.7
Denmark	4.0	6.5	1.4
Finland	1.5	1.7	1.1
France	6.3	8.6	1.4
Germany	5.5	8.9	1.2
Greece	-2.9	-5.7	0.0
Ireland	-6.9	-9.2	1.4
Italy	3.0	3.6	1.9
Netherlands	-1.8	-2.9	0.8
Norway	4.3	8.6	2.3
Sweden	3.9	6.4	-1.6
United Kingdom	5.4	8.0	1.0
United States	-0.7	-0.3	0.9

Source: authors' calculations based on Förster and Pellizzari (2000), Table 2.3
Note: absolute percentage point changes in the replacement rate have been transformed to (relative) percentage changes. Data for all pensioners derived from results disaggregated by age using 1990s levels and 1980s-to-1990s changes in population shares to provide the relevant weights

5. Income-distribution outcomes and the structure pension systems

We began this paper by observing that industrialized countries have very different pension systems. How do the retirement-income outcomes outlined in the previous sections relate to the structure of these pension systems?

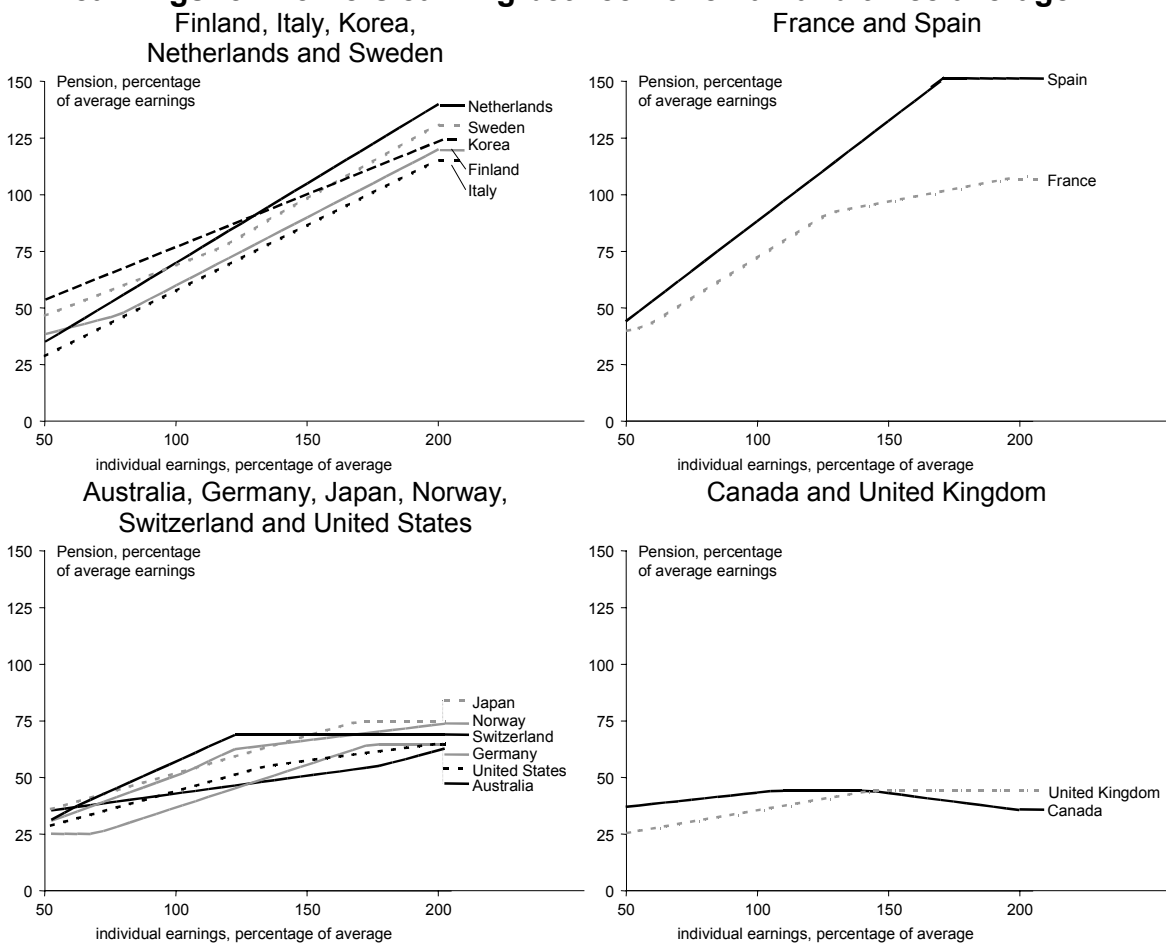
Pension systems are extremely complicated and comparing them is consequently very difficult. Figure 11 shows a simple measure of the structure of pension systems. It projects mandatory pension values for people with different earnings levels based on the rules of today's pension regimes. The charts look at full-career workers earning various proportions of the economy-wide average: half, average, one-and-a-half times and twice mean pay. The vertical axis shows the corresponding individual pension value as a percentage of economy-wide average earnings. This simple measure reveals many of the important differences between countries' pension systems.

In Italy, the public pension scheme has a high ceiling. It is designed to achieve a great degree of earnings replacement, even for high-income workers. A similar effect is achieved by the statutory occupational pension system in Finland and the quasi-mandatory

occupational schemes in the Netherlands and Sweden. The Dutch, Finnish and Korean systems have no ceiling to benefits; in Sweden, the ceiling is very high. In these countries, there is some additional protection for low-income workers, but over much of the income range, projected pension values are linear.

At the other end of the spectrum, the philosophy of the Canadian and British systems is very different. They are redistributive, ensuring that all pensioners achieve a basic standard of living, rather than aiming to give everyone a certain level of earnings replacement. This has led to development of extensive voluntary private coverage, particularly among middle- and higher-income workers. Both countries have mandatory earnings-related public schemes, but these have low ceilings and relatively low accrual rates.

Figure 11. **Projected pension values as a proportion of economy-wide earnings for workers earning between one half and twice average**



Source: Whitehouse (2002*b*)

France and Spain look similar to the first group of countries (over this income range, at least). Their pension systems are focused on a comprehensive-insurance objective, but ceilings are lower than they are in the countries in the first panel of the Figure.

Six countries make up an intermediate group. In Germany and the United States, the public pension systems have a redistributive formula, giving higher replacement rates to lower-income workers. Australia and Switzerland have systems of mandatory contributions to private pension plans at quite low levels along with sizeable basic pension programs. The two-tier Japanese public scheme is similarly redistributive.

We observed in section 3 that the structure of pension systems probably explains the degree of inequality among pensioner incomes relative to inequality among the working age population. However, there is no systematic relationship between the structure of mandatory pension benefits and the other basic measures of economic well-being: the replacement rate and the poverty rate. For example, Canada and the United States typically have the highest replacement rate. But their public pension schemes are much less generous than Italy, which has a replacement rate near to the average.

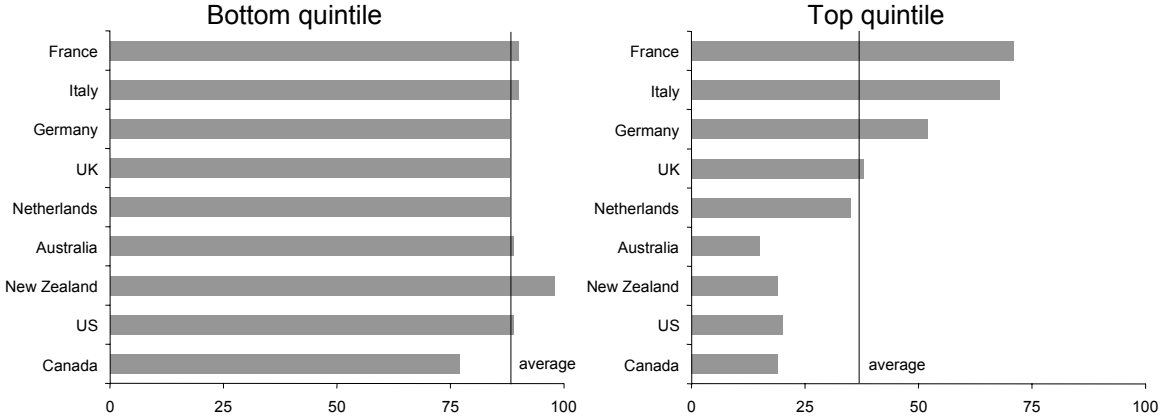
Voluntary retirement-income provision explains the contrast between the structure of public-pension systems and retirement-income outcomes. In particular, the more redistributive public schemes leave space for the development of private pension plans for middle- and high-income workers.

This is illustrated in Figure 12, which shows the proportion of income deriving from the state (pensions and other benefits). Countries are ranked by the average proportion of older people's income that derives from state sources. Unsurprisingly, poorer pensioners everywhere rely on the state for the vast majority of their income. The comprehensive social-insurance schemes in France, Germany and Italy mean that the richest pensioners still get the majority of their income from the state. Indeed, the proportion in France and Italy is only slightly below the proportion for the bottom income quintile. In the other countries, there are predominantly flat-rate public pension systems, or earnings-related public schemes with highly progressive formulae. In Australia, Canada, New Zealand and the United States, only around a fifth of the income of the richest quintile of the elderly derives from public pension programs. These results — confirmed by other studies, such as Disney, Mira d'Ercole and Scherer (1998), Börsch-Supan (1997)

and OECD (2001) — demonstrate the substitutabilty of publicly provided benefits and private sources of retirement support.

There is much less variation in retirement-income outcomes (at least as measured average income-replacement rates and prevalence of poverty) than structural differences in pension systems might imply. The OECD (2001) has described this result as 'convergent outcomes, divergent means'.

Figure 12. **Percentage of pensioners' income from public pensions and other state benefits by quintile of the income distribution, nine countries**



Source: Disney and Johnson (2001)

6. Income concepts

The data underlying the results surveyed here are based on similar concepts of income. This comprises earnings, public transfers, investment incomes, private pensions *etc.* Typically, the studies exclude all (or at least some kinds of) capital gains, because the receipt of a capital gain in a particular period reflects the accrual of gains over the period an asset was held. Including such gains would artificially broaden the income distribution. Incomes in kind are also excluded, as are lump-sum distributions from private pensions.

This raises significant questions concerning the definition of economic well-being and, in particular, the treatment of financial assets and housing wealth. This is particularly pertinent for pensioners who are (or should be, according to the standard lifecycle hypothesis of consumption) dis-saving at this point in their life.

6.1 Capital income and financial wealth

The standard 'statistical' measure of income used in distributional analyses differs from a desirable, 'economic' measure. The Haig-Simons (economic) definition of income is the change in net economic wealth between two points in time plus consumption in that period. Hicks (1946) defines income as 'the maximum amount of money which the individual can spend this week, and still expect to be able to spend the same amount in real terms in each ensuing week'. The difference between the two relates to non-recurring sources of income.

The standard statistical measure is an approximation to the economic definition, but it differs in two important respects. First, it ignores capital gains. Secondly, it does not take account of the effect of inflation. It makes little sense to say that income is the amount one can spend in a period leaving the *nominal* rather than the *real* value of wealth intact. Yet, the standard measure typically includes nominal capital income.

To illustrate, pensioners' investment incomes in the United Kingdom fell by nearly a fifth between 1992 and 1994-95. But during this period, interest rates fell from 15 per cent to less than half that level and inflation fell from a peak of nearly 11 per cent to less than three per cent, leaving real interest rates fairly stable. This implies that the measured decline in the level of investment incomes overstates the change in economic income according to the Hicksian criterion. It would not be possible to spend nominal interest income without reducing the real value of wealth. There are similar distortions in comparisons between countries with different inflation rates.

The Hicksian definition has one undesirable characteristic: it assumes that people's command over resources is limited such that the current stock of wealth is left when they die. (The Hicksian definition underlies the permanent income hypothesis of consumption and saving behavior, which explicitly assumes that people have infinite lives.) However, it is reasonable to suggest that pensioners might finance some of their consumption from running down their wealth. This process is automatic in pension schemes that provide annuities (that is, all public and most private plans). The payment stops when the beneficiaries die and net wealth in the scheme is then obviously zero.

Most other assets, however, are not in the form of annuities, and it may be that the decision to hold part of wealth not in the form of annuities arises from some form of bequest motive. Nevertheless, the stock of wealth represents command over resources that a pensioner *could* spend if she or he so wanted. Moreover, if bequests are altruistic,

then presumably elderly donors derive some utility from the knowledge that their pet charity or relative will benefit after they have passed on. If bequests are strategic, then pensioners enjoy some non-pecuniary return (Bernheim, Shleifer and Summers, 1985).

This invites a comprehensive measure of command over resources that asks: 'how much can people safely spend in a period and expect to have net wealth of zero when they die?' More formally, this measure can be defined as the sum of non-capital income plus initial period wealth times the annuity rate. To examine how this affects income at each age, we utilize age and sex-specific annuity rates to construct an annuity value of wealth (see Disney and Whitehouse, 2001, pp. 75-78 for full details). Data on average holdings of financial assets from a number of countries are drawn from Disney, Mira d'Ercole and Scherer (1998).

Table 8 shows wealth as a ratio to income in the first four columns, split by marital type and between pensioners and older workers. Among the pensioner units, the wealth-to-income ratio is the highest in Australia: single pensioners have assets worth over six times their income; couples, five times. The average across all the countries shown is around 2.5 for both single pensioners and couples, with Japan and the United States also showing high levels of wealth relative to income. The final two columns indicate the effect of including the annuity value of wealth in the income measure. This increase at age 67 is the annuity rate at that age (7.8 per cent) less the return on assets already counted as income (which we have arbitrarily taken as five per cent). The average change is a seven per cent increase in pensioners' command over resources, with significant variation between countries. For example, Australia has a relatively low pension replacement rate but high wealth-to-income ratios, so a broader concept of command over resources puts it closer to other countries. Partly because of fiscal incentives and partly for historical and cultural reasons, most occupational pensions in Australia are drawn as lump sums rather than an annuity. Australian pensioners clearly must finance their consumption by running down their assets: a form of self-provision of an annuity. Compare this with another country, the United Kingdom, say, where most occupational-pension benefits have to be taken as an annuity. Income would be higher and asset holdings lower on standard measures even if the economic position of older people in the two countries were the same. The measure of comprehensive command over resources equalizes the treatment of these two different systems of pension provision. Crystal and Shea (1990) performed a similar exercise on United States data, which showed an increase in the measured

replacement rate for older people from 103 to 124 per cent once the annuity value of wealth was taken into account.

Table 8. **Financial wealth as a proportion of income and effect on income from annuitization**

	Wealth/income ratio		Increase in
	Age 55	Age 67	income
Australia	2.1	5	14%
France	1.5	3.7	10%
Germany	0.5	1.2	3%
Italy	1.3	2.8	8%
Japan	1.7	3.8	11%
Netherlands	0.4	0.9	3%
Sweden	-0.1	0.7	2%
United Kingdom	0.7	1.3	4%
United States	1.5	3.2	9%

Source: Disney, Mira d'Ercole and Scherer (1998), Table 9
Note: data are from between 1992 and 1995, with the exceptions of the United Kingdom (1988-89) and the Netherlands (1990)

6.2 Housing

Many pensioners have a far more valuable asset than their financial wealth in the shape of their own home. Owner occupation yields a flow of services that should, in principle, be treated as an income flow, usually called an 'imputed rent'.

Table 9 shows the extent of home ownership by income across a number of countries. Owner-occupation rates are very high in Australia and the United States and high in Canada, France and the United Kingdom. In continental Europe, they are significantly lower, especially in the Netherlands. In addition, many home-owners still have a mortgage on their property in Germany and the Netherlands. To the extent that housing wealth represents an additional implicit annuity stream, pensioners in the Anglo-Saxon countries are better off than income-based calculations would imply.

Table 9. **Pensioners' housing tenure by income quintile in eight countries**

	Bottom quintile			*Middle quintile*			*Top quintile*		
	Rent	*Mortgage*	*Own*	*Rent*	*Mortgage*	*Own*	*Rent*	*Mortgage*	*Own*
Australia	20	2	78	21	4	75	13	6	81
Canada	42	9	50	23	10	66	21	8	71
France	34	3	62	38	5	57	21	7	72
Germany	63	5	32	64	7	29	37	21	42
Italy	35	4	62	36	3	61	34	3	63
Netherlands	57	11	33	81	7	12	47	26	26
United Kingdom	46	4	50	47	5	48	10	15	75
United States	30	70		15	85		10	90	

Note: 'own' means owned outright except in the United States where it is not possible to separate people who own their home outright from people with a mortgage
Source: Disney and Johnson (2001); authors' tabulations of British Household Panel Survey

Table 10 shows estimates of the value of housing wealth relative to income in a range of countries. Housing wealth is generally much larger for people over retirement age than it is for people of working age. High property prices in Japan and the value placed on home ownership mean that housing wealth is particularly significant there.

The 'asset-rich, income-poor' phenomenon seems particularly pertinent with housing wealth, especially where the tax (and means-test) treatment of retirement-income streams invites individuals to hold their assets in the form of housing. Nevertheless, there are difficulties in simply treating housing as wealth that could be potentially annuitised. Housing is also a consumption good and pensioners are often reluctant to move from their family home (Venti and Wise, 1990; Megbolugbe, Sa-Aadu and Shilling, 1999). Housing wealth may prove a constraint on current living standards rather than simply a source of additional imputed income.

Nevertheless, it would be useful to know what is the annuity value of this housing wealth, and how its use would affect the incomes of pensioners and the poverty rates among pensioner households. Hancock (1998) provides an illuminating account of this in the United Kingdom. Her calculations suggest that the proportion of pensioners (home-owning pensioners) that would gain at least £130 a year from annuitisation of housing wealth rises with age: from 18 per cent (28 per cent) of single men aged 65 or over, to 28 per cent (45 per cent) of single men aged 70 or over and to 44 per cent (75 per cent) of single men aged 75 or over. This is simply because the annuity rate increases with age. However, converting housing equity into an annuity implies the existence of a competitive

and secure equity-release sector. But this market has remained rather thin in both the United Kingdom and elsewhere.

The most common form of equity release practised by older households is therefore through downsizing and changes in tenure status. A number of studies have examined the relationship between house moves and 'excess' housing costs, measured in either physical units or monetary terms. The presumption is that moves are more likely where the house is 'inappropriate' to the size of the family or when there are changes in economic status (such as retirement).

Table 10. **Mean housing wealth to income ratios in eight countries, mid-1990s**

	Under retirement age	*Over retirement age*
Finland	2.1	3.2
Germany	2.8	4.5
Italy	2.1	3.0
Japan	4.2	8.9
Netherlands	1.2	1.6
Sweden	2.1	1.7
United Kingdom	2.6	3.9
United States	1.5	3.0

Source: OECD (2001), Table 2.6

The results of these studies are mixed. Ermisch and Jenkins (1999) find some evidence that retired people in the United Kingdom who move do physically reduce their living space. Evidence from the United States shows that some households move to rented accommodation after retirement as a way of releasing housing equity for consumption (see, for example, Feinstein and McFadden, 1989). But in the United Kingdom, more older households switched from rental to owner occupation than made the reverse move in the late 1980s, perhaps because of 'right-to-buy' policies in local authority housing. Moreover, Disney, Henley and Stears (2002) find no evidence that 'excess' housing budget shares, relative to income, were associated with household moves in the late 1980s. This was perhaps because this was a period of falling house prices that induced elderly households to 'sit tight'. However, that paper does show that moving by elderly households was associated with an increase in financial assets, indicating some evidence of 'equity release' as a motive for moving.

Cross-country comparisons of the value of housing equity (Smeeding *et al.*, 1993; Whiteford and Kennedy, 1995) suffer from two main problems. First, they combine the value of direct subsidies to social rented housing with the value of home-owners' equity. Although both of these relate to housing, they are very different economic issues. Secondly, the data are far from ideal. In most cases, the value of housing equity has to be imputed from a different dataset and matched into the Luxembourg Income Study by age and income. People are then simply assumed to earn a fixed rate of return on the value of housing equity.

Housing wealth is an important determinant of the standard of living for many older households: its use, for example, could reduce significantly measured poverty among very elderly households outside the poorest quintile. Nevertheless, the equity-release market is thin. The evidence that pensioner households use house moves to release equity is strong, but many elderly households are reluctant to move at all, even when they have high potential values of housing equity. Large houses (relative to income) are both a blessing and a curse.

7. Conclusions

This paper has surveyed the results of a dozen recent papers on the relative living standards of older people in a number of OECD countries. The main findings are:

- Average pensioner incomes range from 73 per cent of average population incomes in Denmark to over 90 per cent in Canada and the United States (the 'replacement rate'). Allowing for work-related expenses, and adjusting for differences in family size and composition, pensioners probably have a similar standard of living to their younger counterparts.

- Single women pensioners tend to be worse off than couples, especially if they live alone. Living arrangements differ widely between countries.

- Younger pensioners generally have higher incomes than older pensioners, except in Australia, where the age pension is means-tested and private pensions are mostly taken as lump sums.

- Correlations of cross country rankings of replacement ratios across countries show positive, but not always significant coefficients. Different data sets, methodologies and time periods give different results.

- There is disagreement across studies as to what fraction of pensioners are 'poor', and how these rankings differ across countries. The rankings are sensitive to where the poverty line is set. Another important determinant of the poverty rate is the degree of inequality of incomes of the *working* population.

- Replacement rates for pensioners increased between the mid-1980s and the mid-1990s in most countries, with younger pensioners faring better than older pensioners. Again, however, several countries go against the trend.

- Pensioner income inequality varies substantially. This often reflects differences in inequality in society as whole. :

- Countries have adopted a range of different mandatory pension systems, which differ particularly in the degree of emphasis on insurance and redistributive objectives. There is no systematic relationship between the structure of pension systems and measured replacement rates because of the role of private retirement-income provision. However, pension systems do seem to affect income inequality among pensioners.

- 'Income' in these studies typically comprises income from earnings, pensions (both public and private) and investment income. But many pensioners command other resources, notably financial and housing wealth. Pensioner households can spend more than they receive by drawing down (or annuitizing) this wealth.

- Many older households, however, do not run down their wealth, either by choice (because of, for example, a bequest motive) or because it is illiquid (home ownership). Should the annuity value of this wealth be added to measured income in assessing pensioner well-being? We illustrated the range of impacts to measured income that arise from incorporating the annuitised value of wealth into the calculations and discussed some practical issues that arise when pensioner households try to adopt such a strategy.

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