# The fourth retirement pillar in rich nations

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## Abstract

What role does the fourth retirement pillar of home ownership and private saving play in rich nations? Does this asset-based welfare spread the risks of retirement provision or does it distort consumption patterns and fail to improve the non-housing consumption of the elderly? Is it associated with more or less inequality of retirement consumption? This paper examines the role of home ownership and non-pension saving in supporting the consumption of the elderly in eight wealthy nations using data from the Luxembourg Wealth Study.

Home ownership rates among the elderly are very high in some nations (Australia and US) and expected to increase in the other countries. In Australia, the country with the highest rate of home ownership, home ownership wealth partly compensates for low average pension income, but also shifts the consumption balance away from non-housing goods. In the US home ownership wealth reinforces patterns of income inequality. Home ownership can potentially diversify the risks associated with retirement saving, but as recent events have shown, this cannot be relied upon.

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# 1. Introduction

Wealthy nations use a variety of methods to support consumption in old age. Each of these methods faces different economic, political and social risks and corresponding advantages. This multi-pronged approach was conceptualised as a three-pillar model of retirement income support by the World Bank in 1994 – comprising public minimum pensions, contributory pensions and private savings. Since then, there has been growing interest in the role that can be played by 'asset-based welfare' to provide social insurance via private accumulation of assets (Doling et al, 2010). Additional pillars have been added to the conceptual model as the contributions of different forms of private savings have been considered.

This paper examines the role of the 'fourth pillar' of private home ownership[1] in supporting consumption in old age, and considers this in the context of both income transfers and other forms of privately held wealth in supporting retirement provision.

Private home ownership in old age both increases non-housing consumption by reducing the housing expenditures required of households and also provides direct flows of housing consumption services. It has been a prominent part of the retirement provision discourse in countries like Australia where the other pillars of the retirement income system are relatively weak.[2] Home ownership rates are also high among the elderly in the US and likely to increase over time in many other countries as new cohorts move into retirement (Churi and Jappelli, 2008).

What lessons can the home ownership leaders provide for other countries as they increase the strength of this pillar? Does this form of asset-based welfare spread the risks of retirement provision or does it distort consumption patterns and fail to improve the non-housing consumption of the elderly? Is it associated with more or less inequality of retirement consumption? These issues are discussed using data from the Luxembourg Wealth Study and additional Australian data. Results are presented for Australia, Canada, the UK, US, Germany (limited results), Italy, Finland and Sweden.

In considering the impact of various models for retirement provision, analysis has generally focussed on either outcomes for representative agents, or on outcomes for the most disadvantaged. Both the outcomes for the median retiree and for the poor are of particular policy interest, and this framework is maintained here. The paper begins by considering consumption outcomes for middle-income households. These are defined as the middle 60 per cent of the population when ranked in terms of equivalent disposable income. The paper then considers the relative positions of the bottom (and top) quintile groups in retirement.

## 2. The Luxembourg Wealth Study

The Luxembourg Wealth Study (LWS) seeks to provide a harmonised household-level database containing information on household wealth, income and demographic

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[1]  See Yates and Bradbury (2010) for further discussion of the home ownership retirement model.

[2]  See Castles (1998), Kemeny (1980), Jones (1990) and Ritakallio (2003).

characteristics. The data from seven countries are used here, Canada, the USA, the UK, Finland, Sweden, Germany and Italy.[3] In addition, data from a recent Australian survey is assembled in a similar fashion and analysed alongside the LWS data.[4]

Information on the original data sources are shown in Table 1. The LWS surveys are mainly household surveys, though in the Scandinavian countries they are based on a combination of interview and administrative register data. The LWS surveys provide income on wealth for various years between 1998 and 2002. Two surveys from the USA are included in the LWS, but only the PSID survey has information on housing costs – which is thus used here.

**Table 1    Data sources**

| LWS code and Country | | Year[a] | Source (all except Australia via Luxembourg Wealth study) | Approx sample size (households) | Special features |
|---|---|---|---|---|---|
| AU03 | Australia | 2003-04 | ABS: Household Income and Expenditure Survey | 11,000 | |
| CA99 | Canada | 1999 | Survey of Financial Security | 16,000 | Family unit. Over-sample of high-income areas |
| UK00 | UK | 2000 | British Household Panel Survey | 8,000 | |
| USP00 | USA (PSID) | 2001 | Panel Study of Income Dynamics | 7,000 | |
| FI98 | Finland | 1998 | Household Wealth Survey | 4,000 | Interview and register data |
| SE02 | Sweden | 2002 | Statistics Sweden: Wealth Survey | 18,000 | Interview and register data |
| DE01 | Germany | 2002 | Socio-Economic Panel | 12,000 | Over-sample of high-income |
| IT02 | Italy | 2002 | Bank of Italy: Survey of Household Income and Wealth | 8,000 | |

Note:    a) The year indicated is the year in which the survey was conducted. The value of the stock variables such as household wealth and demographic composition apply to this year, as do the housing expenditure variables. In most countries, the flow variables such as income refer to a previous time period such as the previous financial year.

Some key reference indicators for these countries and years are shown in Table 2. The PPP (Purchasing Power Parity) index is an index of the number of units of the national currency (in the specified country and year) that would be needed to buy the

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[3]   The German survey has missing housing expenditure data and so measures based on this are not included. See Luxembourg Wealth Study (2010) and www.lisproject.org for the data documentation. The data presented here were extracted from the LWS in May 2010.

[4]   It is anticipated that data from this survey will be added to a future release of the LWS.

same quantity of goods from a given basket as would be purchased by one US dollar in the USA in 2002.

Column 6 uses this index to calculate GDP per capita on a common currency basis. The US has the highest living standard when calculated on this basis, with Finland and UK the lowest.

Column 7 presents an alternative indicator of national living standards, disposable income per household as recorded in the different surveys. Here the US is even more of an outlier. This reflects the different size of the state in different countries (eg low taxes and services in the US means a relatively higher disposable income), but also might reflect differences between the survey coverage of household incomes and the GDP concept.

## Table 2    Key reference indicators

| LWS code | Country | Year | GDP/capita ('000, national currency, current prices) | PPP index (US 2002) | GDP/capita ('000 USD 2002) | Disposable income/ household ('000 USD 2002) | House price to rent ratio relative to long-term average |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 (=4/5) | 7 | 8 |
| AU03 | Australia | 2003-04 | 41.7 | 1.401 | 29.8 | 32.5 | 1.68 |
| CA99 | Canada | 1999 | 32.3 | 1.119 | 28.9 | 35.7 | 1.08 |
| UK00 | UK | 2000 | 16.3 | 0.607 | 26.8 | 30.2 | 1.00 |
| USP01 | USA (PSID) | 2001 | 35.5 | 0.983 | 36.1 | 50.4 | 1.04 |
| GE02 | Germany | 2002 | 26.0 | 0.959 | 27.1 | 28.3 | 0.96 |
| IT02 | Italy | 2002 | 22.7 | 0.825 | 27.5 | 28.0 | 1.06 |
| FI98 | Finland | 1998 | 23.8 | 0.923 | 25.8 | 24.9 | 1.08 |
| SE02 | Sweden | 2002 | 265.7 | 9.365 | 28.4 | 25.5 | 1.20 |

Notes:   Source; columns 4 to 6, SourceOECD, extracted 26/10/07. Australian data are based on averages of the two calendar years. Finland data are in 1999 Euros. The PPP (purchasing power parity) price index is calculated as the multiple of the PPP index (relative to $US) for the given year and the US implicit price deflator for GDP (relative to 2002).
column 7, LWS and ABS, see Table 1;
column 8 (OECD, 2005).

The last column of the table presents information on the cyclical state of the housing market in the given year in each country. This shows the mean dwelling sale price relative to mean dwelling rent, compared to the long term average of this ratio. The largest divergence is apparent for Australia in 2003-04, where prices compared to rents were almost 70 per cent above their long-term trend. This reflects the housing boom of the preceding years. In no other countries were house prices so much at variance with their long-term averages. Sweden is closest, at 20% above the average. The strong growth, and then steep decline, in US house prices came after 2001.

## 3.   Foundations (wealth)

How does the fourth pillar of retirement provision for the middle-class vary across nations? Table 3 shows that wealth holdings in retirement vary considerably.

In this table, as in the remainder of this report, 'the middle' is defined as the three middle quintile groups when the adult population is ranked by household equivalent disposable income.[5]

Results are shown for two age groups, 'older' and 'prime age'. These are defined by the age of the household head (either 45-59) or 65+ respectively. Where the household is headed by a couple, the male age is used.[6] The middle is defined separately for each age group.

Since wealth is most naturally recorded at the household level, the counting units in this table are households. That is, the table shows the average wealth levels of the households containing the middle 60 per cent of the adult population.[7]

If we are interested in how wealth holdings can finance consumption in retirement, it is most natural to consider wealth in relation to income. Hence mean wealth levels are expressed relative to mean disposable income.

The mean disposable income (in national currency units) among the middle income older and prime age populations are shown in the last row of each panel. The final row of the table shows the ratios of these two numbers. The relative incomes of the older population vary considerably across countries. Australia stands out as having a particularly large income decline between prime-age and retirement with incomes among the older population only 44 per cent of the average income in prime-age households. The US, has the highest relative income, at 62 per cent.

The incomes of the elderly derive primarily from pension entitlements and investment returns. The LWS does not include rights to pension entitlements, but it does provide information on investment assets. The top panel of Table 3 shows the US standing out as having the highest level of financial assets relative to disposable income among the older middle-income population. On average, these amount to 2.7 times the average annual income among this group. Excluded from this table is wealth held in business ownership, and so this will be an underestimate of income-generating assets.

When real estate other than the main residence is included, the older US middle income households have 3.5 times their income in potentially income generating assets – as do the Australian retired.  (Though note that some of the 'other real estate' comprises non-income generating holiday houses etc). The lowest levels of non-own-home assets are found in the European countries – which are also the countries with the most developed income-related pension systems.

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[5]   Bradbury (2008) includes related results for the whole population.

[6]   Except in Canada, where the survey definition of household head is used.

[7]   In later sections of this paper, where the focus turns to consumption outcomes, individuals are used as the counting unit.

But the largest cross-national variation in asset holdings (relative to income) is with respect to wealth held by home-owners (the top row of Table 3). This ranges from 2.2 times average income in Sweden to 11.3 times in Australia.

This partly reflects variations in home-ownership rates. Australia and the US have very high levels of home ownership among the older population (84%), while Germany, the UK and Sweden have less than 60 per cent home-owners. The cohort analysis of Churi and Jappelli (2008) suggests that many of these other countries will catch up to these higher home ownership rates in the future.

The variation in own-home wealth also reflects cyclical variation in housing markets. The 2003-04 data in Australia was collected at the end of a 5-year house price boom, while the other countries have house prices much closer to the longer term average relative to rents (see Table 2). The US and UK data were collected prior the most recent house price boom (and bust). Nonetheless, even if Australian house prices were deflated by the factor in the last column of Table 2, they would still be higher relative to income than in any other country.

In an arithmetic sense, Australian result also reflects the fact that the incomes of the older population in Australia area also low. Table 4 presents the data from Table 3 in terms of the share of wealth held in housing. From this perspective Australia is not such an outlier – even if no adjustment is made for the housing market cycle. However, the compositional picture shown in Table 4 is misleading in that it only provides part of the story of wealth holdings after retirement. A more comprehensive view of wealth as including all rights to future consumption would also include the value of future pension entitlements.[8] These entitlements include both public pension entitlements as well as private pensions that deliver income streams. These are both relatively low in Australia, and so if they were included, the Australian share of wealth held in housing would increase commensurately.

Because this data is not available, we turn in the next section to outline a consumption-based approach to the living standards of the older population. To what extent does the fourth pillar provide resources for consumption after retirement? Because owner-occupied housing constitutes the main component of non-pension wealth (53 to 79% in Table 4) we focus primarily on the consumption implications of this form of wealth holding.

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[8]   It is arguable whether one should follow this approach as a general principle. Future entitlements are different from current holdings in several ways. For example, you cannot pass on future pension entitlements to heirs (except for spouses in some cases). Nonetheless, from the perspective of the financing of living standards in retirement, it makes sense to include entitlements such as future pension rights in a symmetrical way to wealth holdings.

**Table 3    Wealth relative to disposable income among the older and prime-age middle-income households (wealth relative to annual income)**

| | Australia | Canada | UK | US | Germany | Italy | Finland | Sweden |
|---|---|---|---|---|---|---|---|---|
| | | | | Older (65+) | | | | |
| Main residence | 11.3 | 3.4 | 4.9 | 3.5 | 4.7 | 5.8 | 3.6 | 2.2 |
| (% owners) | (84) | (70) | (59) | (84) | (44) | (74) | (75) | (51) |
| Other real estate | 1.2 | 0.5 | 0.1 | 0.8 | 0.8 | 0.9 | 1.0 | 0.4 |
| Financial assets | 2.3 | 1.7 | 1.4 | 2.7 | 0.9 | 1.0 | 0.7 | 1.7 |
| Total assets | 14.8 | 5.6 | 6.3 | 7.0 | 6.3 | 7.7 | 5.3 | 4.3 |
| Total debt | 0.1 | 0.2 | 0.1 | 0.4 | 0.2 | 0.0 | 0.1 | 0.4 |
| Net worth | 14.7 | 5.4 | 6.2 | 6.6 | 6.1 | 7.7 | 5.2 | 3.9 |
| Disposable income (pa) | 23,060 | 25,387 | 10,690 | 32,048 | 18,955 | 14,874 | 13,846 | 157,951 |

| | Australia | Canada | UK | US | Germany | Italy | Finland | Sweden |
|---|---|---|---|---|---|---|---|---|
| | | | | Prime-age (45-59) | | | | |
| Main residence | 5.4 | 2.5 | 4.2 | 2.5 | 3.4 | 4.6 | 2.6 | 2.2 |
| (% owners) | (84) | (78) | (83) | (82) | (52) | (75) | (85) | (70) |
| Other real estate | 1.7 | 0.6 | 0.3 | 0.5 | 0.6 | 0.9 | 0.7 | 0.3 |
| Financial assets | 0.6 | 0.6 | 0.8 | 0.8 | 0.4 | 0.7 | 0.5 | 0.6 |
| Total assets | 7.6 | 3.6 | 5.2 | 3.8 | 4.4 | 6.2 | 3.8 | 3.1 |
| Total debt | 1.4 | 1.0 | 1.0 | 1.1 | 1.0 | 0.2 | 0.5 | 1.2 |
| Net worth | 6.2 | 2.6 | 4.1 | 2.7 | 3.4 | 6.0 | 3.3 | 1.9 |
| Disposable income (pa) | 52,988 | 47,023 | 22,501 | 51,886 | 32,769 | 26,870 | 26,830 | 306,003 |
| Older/prime age | 0.44 | 0.54 | 0.48 | 0.62 | 0.58 | 0.55 | 0.52 | 0.52 |

Notes:   The population is households containing the middle 3 disposable income quintile groups of people (only head and spouse counted when defining quintile groups). The age categories are defined using the age of the male household head where there is one. Wealth items excluded are life insurance and unrealised pension assets, business assets and debt, vehicles, household durables and collectibles. In Australia, superannuation account balances are included but not entitlements to defined benefit plans or other income streams. Other real estate wealth is net of debt in the US. NB UK data does not add up because of cases with missing data (there are no missing data for main residence value). Source: Australia, Australian Bureau of Statistics 2003-04 Household Income and Expenditure Survey, confidentialised unit record file. Other countries, Luxembourg Wealth Study (LWS).

**Table 4     Wealth relative to total wealth among the older and prime-age middle-income households (%)**

| | Older (65+) | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | Australia | Canada | UK | US | Germany | Italy | Finland | Sweden |
| Main residence | 77.1 | 63.6 | 78.7 | 53.2 | 76.6 | 75.9 | 68.8 | 56.2 |
| Other real estate | 8.1 | 9.6 | 2.1 | 12.6 | 12.6 | 11.1 | 19.9 | 9.0 |
| Financial assets | 15.8 | 31.2 | 23.3 | 40.4 | 14.4 | 13.4 | 13.0 | 44.1 |
| Total assets | 101.0 | 104.4 | 101.2 | 106.1 | 103.6 | 100.4 | 101.7 | 109.4 |
| Total debt | 1.0 | 4.4 | 1.2 | 6.1 | 3.6 | 0.4 | 1.7 | 9.4 |
| Net worth | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

| | Prime-age (45-59) | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | Australia | Canada | UK | US | Germany | Italy | Finland | Sweden |
| Main residence | 87.3 | 93.8 | 102.3 | 91.4 | 98.0 | 77.3 | 77.7 | 115.8 |
| Other real estate | 26.8 | 21.6 | 7.6 | 18.2 | 18.9 | 14.3 | 22.1 | 13.5 |
| Financial assets | 9.1 | 21.9 | 18.5 | 29.7 | 12.8 | 11.6 | 14.8 | 33.6 |
| Total assets | 123.2 | 137.3 | 128.4 | 139.3 | 129.7 | 103.2 | 114.6 | 162.9 |
| Total debt | 23.2 | 37.3 | 25.0 | 39.3 | 29.7 | 3.2 | 14.6 | 62.9 |
| Net worth | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Source:  Table 3.

## 4.   A housing-consumption framework

The role of the fourth pillar in providing for consumption during the retirement years is most clearly understood if we consider resources in terms of their impact on household consumption. This section describes a simple framework for considering the impact of housing wealth on consumption during retirement. The approach is a variant on the approach of adding imputed rent to disposable income in order to provide a more comprehensive measure of household resources.

This framework is illustrated in Figure 1. This describes the role of housing in relation to the economic concepts of disposable income, imputed rent, full income, saving, consumption and expenditure. The first column shows the allocation of household disposable income to non-housing consumption (purchases of goods and services other than housing), rent, mortgage repayments (interest and principal) and non-housing saving (the increase in value of other assets). Cash saving can be negative if people are drawing down on their non-housing assets, in which case the sum of non-housing consumption, rent and mortgage repayments will be greater than disposable income.

Unlike most other forms of saving used to support retirement, own-home housing both provides consumption services as well as being an investment. Imputed rent is the income that the household could be receiving if it were renting its home to itself. It can be defined as the gross rent that would be obtained for the dwelling, minus the maintenance costs and (preferably inflation-adjusted) interest costs of financing the dwelling. One way of estimating gross rent is as a function of the value of the house

and land.[9] Here, it is assumed that 5 per cent of the gross house value of dwelling value (adjusted for the house price cycle) is a reasonable estimate of rental value in all the countries. This value has been used in Australian research[10] and Davis et al, 2008, estimate a similar value for the US but we do not have evidence for the other countries.

The 'full income' concept shown in the figure adds capital gains to disposable income and imputed rent. (It does not include the other non-housing elements that some might include in such a concept, see note to the table). Saving is defined as those flows that add to the stock of the household's wealth. Here this includes (real) mortgage principal repayments, non-housing saving and capital gains.

Consumption, is full income minus saving. It has two components, housing and non-housing consumption. As shown in the final column, this is different from expenditure.[11]

**Figure 1      Housing-related income and consumption concepts**

| Component | Disposable income (DI) | DI plus imputed rent | Full income | Saving | Consumption | Expenditure |
|---|---|---|---|---|---|---|
| Housing consumption of home owners = F(house value) | | ▓ | ▓ | | ▓ | |
| Rent | ▓ | ▓ | ▓ | | ▓ | ▓ |
| Non-housing consumption | ▓ | ▓ | ▓ | | ▓ | ▓ |
| Mortgage interest and maintenance costs | ▓ | | | | | ▓ |
| Mortgage principal repayments | ▓ | ▓ | ▓ | ▓ | | ▓ |
| Non-housing saving | ▓ | ▓ | ▓ | ▓ | | |
| Capital gains | | | ▓ | ▓ | | |

Notes:  Excludes non-housing durables, state and employer-provided non-cash income, value of home production and the value of leisure. Mortgage components assumed be on an inflation-adjusted basis.

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9    Other approaches have also been used. See Yates (1991, 1994) and Saunders and Siminski (2005).

10   See previous footnote.

11   These concepts can nonetheless be estimated with household expenditure data. However, the additional costs associated with the collection of this data mean that it is less readily available in cross-nationally comparable form. The irregular timing of expenditures introduces other problems, particularly if it is desired to estimate the distribution of consumption.

It can be seen from this figure that non-housing consumption can be estimated from several sources. One approach is to subtract rent, mortgage interest, maintenance, mortgage repayments and non-housing saving from disposable income. Another is to collect data on non-housing expenditure. We do not have suitable expenditure data, but we can approximate the first approach by deducting rent and mortgage payments from disposable income.

This housing-related income and consumption framework forms the basis for the results below. However, there are several important caveats that should be appreciated when considering the results.

First, we do not have data on maintenance expenditures (and other landlord costs such as land taxes which should be considered in the same way). If we calculate non-housing consumption as income minus housing costs, then this will be too large as some of this residual income should be devoted to maintaining the value of the asset.

More importantly, though this framework incorporates the housing wealth component of the fourth pillar, it does not directly address all of the other aspects of private saving for retirement. Some are incorporated because they generate income which is included in the disposable income measure. Wealth held in the form of annuities is fully incorporated because both the interest return and capital draw-down will typically be included in income. Other forms of private saving are only incorporated to the extent to which they generates income, but not to the extent to which the capital might be drawn-down to finance current consumption. Such wealth draw-downs should be included as negative non-housing saving in Figure 1. If they were included they would contribute to non-housing consumption, since this is the item that is calculated as a residual.

It is not obvious how these items should be included. One approach is to remove capital income from disposable income and then add the value of an annuity that could be purchased using the current value of all non-housing wealth. (eg Wolff and Zacharias, 2003). This gives a measure of total potential consumption.

The problem with this is that this describes a behaviour that is not actually undertaken. Some people might approximate this dissaving flow via a gradual liquidation of their assets. However, it is probably equally common for people to hold constant the nominal value of financial assets while consuming the income flow. This income flow would probably be included in the income measure used here. Indeed, in the absence of comprehensive insurance markets to cover longevity and care needs risks, maintaining a substantial level of precautionary saving is a sensible strategy.

For these reasons, no attempt is made to impute annuity flows to assets. Nonetheless, we return to consider possible implications of potential dissaving patterns below (in Section 7).

Finally, the treatment here excludes many other components that some might include in full income, such as the value of home production and leisure, and the value of government services used. This exclusion is mainly for data availability reasons. However, it should be noted that when comparing the living standards of people of different ages, the inclusion of these other components in the calculation would also require the inclusion of assumptions about the relative needs of people of different

ages. This would be of particular importance when incorporating the value of health services, where the needs of the older population for health services are clearly much greater than those of the prime age population.

## 5. Methods

The model outlined above is operationalised using the following measurement definitions.

*Age.* Households are classified according to the age of the household head (the male if partnered). Two groups are considered, *prime age*, aged 45 to 59 and *old* if aged 65+.

Other than in Table 3, all income, expenditure and consumption variables are presented in adult equivalent units, divided by the square root of the number of people in the household (top-coded to 6 to match the Australian data). In addition, the own-home wealth and housing expenditure values are Winsorised at the 99th percentile within each age group in each country.[12]

*Disposable income* This is total household cash income, minus income tax and compulsory employee social security contributions. Negative incomes are set to zero.

*Middle income.* Households are defined as middle income if their disposable income falls into the middle three quintile groups (middle 60%) of the disposable income distribution for their age group (prime age or old). For this calculation, each quintile group is defined to contain the same number of household heads and spouses. This approach is used, rather than the more common counting by people, because we are primarily interested in a comparison of the living standard of prime age adults with that of older adults.[13]

The main focus of the analysis is on the middle income group, but some results are also presented for the top and bottom quintile groups.

*Owner-occupied housing wealth* This is the market value of the dwelling (usually as estimated by the respondent). Set to zero where the dwelling is not owned by any household members. For farms, only the value of the dwelling and immediate surrounding land area is included.

*Home ownership* Households with positive owner-occupied housing wealth are defined as home-owners.

*Other wealth* variables. These follow the LWS definitions (see discussion of Table 3).

*Own-housing consumption*: 5 per cent of owner-occupied housing wealth adjusted for the house price to rent ratio (ie divided by column 8 of Table 2). This adjustment

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[12]  Winsorisation of variable X means that the value of $X_i$ is replaced with $\min(X_i, X(99))$ where X(99) is the 99th percentile of X. The main motivation for this adjustment is that US data contains a small number of cases with very high housing expenditures, possibly reflecting some large lump-sum mortgage repayments that are not indicative of average expenditure patterns.

[13]  Ideally, the analysis would be conducted at the person level. However, we cannot do this for the Canadian survey.

removes the impact of cyclical variations in house price movements. It mainly has an effect on the Australian estimates, as the 2003-04 survey was conducted towards the end of a house price boom.

*Rent* Annual rent paid for the dwelling. In the UK this is gross rent paid before reductions due to housing benefit.[14]

*Housing expenditure* Rent plus mortgage principal and interest payments.[15] This is only available in Australia, UK, US and Italy.

*Housing expenditure excluding mortgage repayments.* Rent plus mortgage interest payments. Only available in Australia, Canada, Finland and Sweden.[16]

*Housing consumption:* Own-housing consumption plus rent.

*Income after housing expenditure:* Disposable income minus housing expenditure. Ignoring the impact of other forms dissaving, this an indicator of *non-housing consumption*.

*Income after current housing expenditure:* Disposable income minus housing expenditure excluding mortgage principal payments. *Non-housing consumption plus mortgage repayments*.

*Consumption:* Housing consumption plus income after housing costs (non-housing consumption).

*Full income*: Housing consumption plus income after current housing costs.

The full income measure is thus consumption plus saving due to mortgage principal repayments. The terms 'consumption' and 'full-income' should be interpreted in the context of the caveats given above – particularly the exclusion of other forms of dissaving which might contribute to consumption after retirement.

## 6. Consumption patterns for middle-income households in retirement

Table 5 shows the decomposition of household income, housing expenditure and consumption using this framework. This shows the mean levels of consumption for the middle-income older population in each country, all expressed relative to mean disposable income for this population group. The actual PPP-adjusted mean dollar values can be found in Appendix Table 10.

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[14]   The LWS variable RIXP is used (plus NRCBEN for the UK). Rent is set to zero for home-owners (because RIXP also includes mortgage payments).

[15]   LWS variable RIXP (plus NRCBEN for the UK). Ideally, maintenance expenditures should also be included.

[16]   German data is nominally available in the data, but has been excluded from this version of the paper because of a high fraction of missing data.

**Table 5    Consumption and expenditure relative to disposable income for the middle-income older population (%)**

|  | Australia | Canada | UK | US | Germany | Italy | Finland | Sweden |
|---|---|---|---|---|---|---|---|---|
| (1) Disposable income | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| (2) Housing consumption | 35 | 24 | 32 | 20 | 27 | 39 | 20 | 23 |
| Own home | 32 | 15 | 24 | 17 | 24 | 28 | 16 | 9 |
| (3) Housing expenditure | 4 |  | 9 | 11 |  | 38 |  |  |
| (4) Housing exp. excl m. prin. | 4 | 21 |  |  |  |  | 4 | 26 |
| (5) Income after housing expenditure (Non-housing consumption) = (1) - (3) | 96 |  | 91 | 89 |  | 62 |  |  |
| (6) Income after current housing expenditure (Non-housing consumption + mortgage repayments) = (1) - (4) | 96 | 79 |  |  |  |  | 96 | 74 |
| (7) Consumption = (2) + (5) | 131 |  | 124 | 108 |  | 101 |  |  |
| (8) Full income = (2) + (6) | 131 | 102 |  |  |  |  | 116 | 96 |

Notes:   The table shows the mean consumption or expenditure aggregate relative to mean disposable income. All measures are equivalised and the mean of each component is calculated across household heads and spouses (where present). Note UK data does not add up because of missing data on housing expenditures for a small fraction of households.

Source:   Calculated from Appendix Table 10.

Housing consumption as a share of disposable income is greatest in Italy where it amounts to 39 per cent of disposable income. It is also relatively high in Australia, UK and Germany, and lowest in Canada, the US and Finland.

In interpreting these numbers it is important to be cognisant of both the numerator and denominator. In particular, the Italian pattern is unusual in that the housing consumption to disposable income is high both for the old and prime age. For the prime age, the ratio is 31 per cent, compared to 22 per cent or lower for all the other countries (this can be calculated from Appendix Table 10). This is suggests that disposable income might be systematically under-reported in Italy.

The own-home component of housing consumption is highest in Australia and lowest in Sweden.

Housing expenditure, on the other hand, is generally only a small proportion of the disposable income of the older population in most countries. This includes rent plus mortgage interest payments and, in some countries, mortgage principal repayments. Mortgage payments both with and without principal repayments are available in Australia. The average difference between them is only about 0.3 per cent of average disposable income.

The primary exception to the low housing expenditure pattern is again Italy, where housing expenditure is a very large proportion of disposable income – reinforcing the suggestion of income under-reporting discussed above. However, it should also be noted that housing expenditures are around a fifth to a quarter of disposable income in Canada and Sweden.

The measures of income after housing expenditure subtract these housing expenditures, and so vary in the opposite direction. Finally, the 'consumption' and 'full income' items add housing consumption to the after-housing measures to show the overall housing-adjusted consumption measure (or consumption plus mortgage saving). Because of its high level of housing consumption and low level of housing expenditure, Australia has the highest level of total consumption relative to disposable income among the older population.

Table 6 presents this same information, but here expressed as a fraction of total consumption or full-income. If we ignore the difference between consumption and full income (there is little difference for Australia where we have both), we can use this to compare the share of total consumption committed to housing consumption in the different countries. This is highlighted in bold in the table.

After Italy, Australia and the UK have the highest share of consumption devoted to housing (26-27%), followed by Sweden and Canada at 23-24 per cent. The US and Finland have relatively low shares of consumption devoted to housing (17-18%).

**Table 6    Consumption shares for the middle-income old (%)**

| | Australia | Canada | UK | US | Germany | Italy | Finland | Sweden |
|---|---|---|---|---|---|---|---|---|
| **Consumption shares** | | | | | | | | |
| Disposable income | 76 | | 81 | 92 | | 99 | | |
| **Housing consumption** | **27** | | **26** | **18** | | **38** | | |
|   Own home | 24 | | 19 | 16 | | 28 | | |
| Housing expenditure | 3 | | 7 | 11 | | 37 | | |
| Income after housing expenditure (non-housing consumption) | 73 | | 74 | 82 | | 62 | | |
| Consumption | 100 | | 100 | 100 | | 100 | | |
| **Full income shares** | | | | | | | | |
| Disposable income | 76 | 98 | | | | | 86 | 104 |
| **Housing consumption** | **27** | **23** | | | | | **17** | **24** |
|   Own home | 24 | 15 | | | | | 14 | 9 |
| Housing expenditure | 3 | 21 | | | | | 4 | 27 |
| Income after current housing expenditure (non-housing consumption + mortgage repayments) | 73 | 77 | | | | | 83 | 76 |
| Full income | 100 | 100 | | | | | 100 | 100 |

Notes:    As for Table 5.

However, these results are based on many assumptions. They do not take account of any liquidation of assets (which would increase non-housing consumption if included), and they also use a very simple approach for estimating own-housing consumption (a fixed fraction of home value). Similarly, for renters, rent paid is used as an estimate of housing consumption, which will not be appropriate when there are substantial subsidies.[17]

The impact of the last two assumptions is ameliorated if we compare across the lifecycle within the same country. Indeed, this is probably the more interesting question when looking at the role of private saving in providing for retirement. How do consumption levels and patterns change between prime age and retirement in these different countries?

## 7. The middle-income transition from prime age to retirement

Table 7 shows the difference in income and consumption levels between the prime-age (head 45-59) and retirement age (head 65+) middle-income households. These ratios are all derived from a single cross-section and so do not represent the retirement transition for any particular cohort. As noted above, increasing home ownership rates mean that the wealth holding patterns of future cohorts of retired will be quite different in some countries. Nonetheless they do present a picture of how different features of the consumption maintenance package have become more important in different countries. This picture is indeed quite variable.

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[17]   The impact of the UK housing benefit is removed, but similar data for other countries was not available. See footnote 14.

**Table 7      Old relative to prime-age in middle-income households (%)**

|  | Australia | Canada | UK | US | Germany | Italy | Finland | Sweden |
|---|---|---|---|---|---|---|---|---|
| (1) Disposable income | 54 | 68 | 63 | 73 | 73 | 74 | 64 | 64 |
| (2) Own home consumption | 111 | 98 | 76 | 105 | 103 | 94 | 87 | 64 |
| (3) Housing consumption | 105 | 110 | 93 | 105 | 102 | 93 | 91 | 107 |
| Housing expenditure | | | | | | | | |
| (4)  Current (rent+mort int) | 28 | 73 | | | | | 67 | 100 |
| (5)  All (rent+mort int+prin) | 19 | | 56 | 26 | | 76 | | |
| (6) Income after housing expenditure (Non-housing consumption) | 59 | | 64 | 96 | | 73 | | |
| (7) Income after current housing expenditure (Non-housing consumption + mortgage repayments) | 56 | 67 | | | | | 63 | 57 |
| Consumption = (3)+(6) | 67 | | 70 | 97 | | 80 | | |
| Full income = (3)+(7) | 64 | 74 | | | | | 67 | 64 |
| Housing consumption as a percentage of total consumption | | | | | | | | |
| Old | 27 | | 26 | 18 | | 38 | | |
| Prime-age | 17 | | 19 | 17 | | 33 | | |
| Ratio | 1.58 | | 1.34 | 1.08 | | 1.17 | | |
| Housing consumption as a percentage of full income | | | | | | | | |
| Old | 27 | 23 | | | | | 17 | 24 |
| Prime-age | 16 | 16 | | | | | 13 | 14 |
| Ratio | 1.64 | 1.49 | | | | | 1.37 | 1.66 |

Notes:   The table shows the mean consumption or expenditure aggregate for people in 'old' households (head aged 65+) relative to the mean for prime age households (head 45-59). All measures are equivalised and the mean of each component is calculated across household heads and spouses (where present). Note UK data does not add up because of missing data on housing expenditures for a small fraction of households.

Source:  Calculated from Appendix Table 10.

In the US, Germany and Italy older households have equivalent incomes around ¾ of those with prime-age heads. Canada is only slightly lower and the UK and the two Nordic countries have 'replacement rates' of just under 2/3. The middle-income Australian older population, however, has incomes only just above ½ that of their prime-age compatriots.

Since these calculations are based on equivalised income, they provide some indication of the relative living standards of the different age groups. However, even aside from the role of the 'fourth pillar' in supporting consumption (and possible cohort differences), we should not assume that the middle class must inevitably face a decline in living standards after retirement. In particular, there is no consensus on how to take account of different needs associated with ageing and retirement. The retired have less work-related expenditures, more leisure time, but also poorer health and greater health expenditures.

These different patterns of needs associated with retirement, however, apply in all the countries here. Does the fourth pillar compensate for these differences? Australia is the greatest outlier in terms of disposable income replacement rates and, as was discussed in the introduction, this trade off between the retirement pillars is a long-accepted feature of the retirement system there. In this table, we can see that the relatively high rates of home ownership among the Australian elderly do compensate for their relatively low income, but not entirely. In terms of non-housing consumption, the relative position of the middle-income Australian elderly is only just behind that of the UK, Finland and Sweden. Using the consumption/full income measures, the retirement replacement rates are the same as the Nordic countries and close to that in the UK.

It is interesting to compare the situation of Australia with that of the US, both countries where forms of private saving are generally accepted as part of retirement provision. In both cases, the housing consumption of the elderly is slightly higher than that of the prime age (line 3 of Table 7). However, the total consumption (or full income) 'replacement rate' (the last two lines of the top panel) is very low in Australia (equal lowest with Sweden), but very high in the US (by far the highest). This result arises because in the US middle income families benefit from strong pension systems in addition to home ownership and other forms of private saving. In Australia, on the other hand, private saving is a replacement for a weakly developed middle-income pension system.[18]

The last panel of Table 7 shows the fraction of either consumption or full income that is allocated to housing consumption among the middle income prime age and older population. In all countries, the older population devotes more of its consumption/full income to housing. The shift in apparent consumption patterns is greatest in Australia and Sweden and lowest in the US. In Australia, this result arises because the older population have high home ownership rates (and high home values) but low incomes. In Sweden, this arises because the older population have relatively high housing expenditures (particularly rent, see Appendix Table 10) – which also reduces non-housing consumption. In the US, high home ownership and hence low repayments, coupled with high disposable incomes lead to relatively high level of non-housing consumption.

Whether these differences imply a problematic pattern of relative housing consumption by the middle-class elderly in some countries cannot be ascertained on this evidence alone. It does suggest, however, further investigation of potential relative over-consumption of housing (and corresponding under-consumption of non-housing goods) in Australia (because of high home-ownership) and in Sweden (because of housing costs reducing non-housing consumption). In the former country at least, this is consistent with an often stated policy concern that the elderly are housing-asset rich, but income poor (eg AHURI, 2004).

It is also possible that non-housing consumption might be higher in some countries because of the liquidation of assets in retirement. Some of this is included in disposable income and hence non-housing consumption as defined above (annuities

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[18]    This will change for future cohorts, with publicly mandated private saving schemes (superannuation) expanding rapidly.

and the income flows from investments, which might thus be declining in real value over time), but other forms, such as the liquidation of financial and non-financial assets and indeed of owner-occupied housing, is not.

As discussed in section 4 above, calculating the maximum potential consumption that could be derived from these goods is not really appropriate when looking at patterns of consumption, because these assets are unlikely to be fully liquidated before death.[19]

However, a feel for the order of magnitude of the potential consumption available from liquidating non-housing wealth can be obtained from the data in Table 3. For example, this table shows that the low disposable income in Australia is indeed balanced by a high level of other assets in addition to owner-occupied housing. Ignoring debt, these add up to 3.5 times disposable income, compared to 1.5 to 2.2 times in the other countries (apart from the US, which is the same as Australia). The additional potential non-housing consumption possible in this country can be crudely measured by assuming that approximately 1.5 units of average disposable income were drawn down linearly over a 15 year period – adding 10 per cent to disposable income per annum. If this is added to the disposable income calculation of Table 7, the old to prime-age disposable income ratio in Australia increases from 54 to 60 per cent, which is still the lowest among these countries. The housing consumption ratios in the bottom panel based on consumption and full income similarly fall, from 1.58 to 1.47 and 1.64 to 1.53 respectively. These changes would still leave Australia as an outlier in terms of the increase in housing consumption share after retirement.[20]

## 8.   Comparing the middle with the top and bottom retired

How effective have these different models of retirement income provision been in providing for the most disadvantaged elderly? This section examines how their outcomes compare to those of 'the middle' discussed in the earlier sections. We also consider how the top 20 per cent fare.

Table 8 shows the average values of the income and consumption items described above for the bottom quintile group, relative to those for the middle three quintile groups (of equivalent income). This is thus a measure of inequality in the bottom half of the older population. It is not a measure of income replacement, which might compare the living standards of the bottom quintile prime-age and old or a measure of poverty, which might compare the living standards of the bottom quintile of the old with a fixed standard (absolute poverty) or with the average living standards of the overall population (relative poverty). Estimates of relative poverty using this

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[19]   With respect to housing equity, in the US, there is mixed evidence. Haider et al (2000) find some evidence that retirees do tend to move their wealth into non-housing forms. Fisher et al (2007), on the other hand, conclude that home equity increases after retirement with few retirees leaving home ownership or increasing their housing debt. Across countries, Disney and Whitehouse (2002) find some limited evidence of home ownership down-sizing. Churi and Japelli (2008), find, across several countries, that home ownership rates decline by about one percentage point per annum after age 75.

[20]   These simple calculations ignore the impact of saving among the prime-age sample. However, some of this saving is already removed from disposable income (in Australia, contributions to mandated private superannuation funds are not included in disposable income, but the lump-sum payouts will be included in the wealth of the elderly).

consumption framework can be found in Yates and Bradbury (2010). That paper focussed on relative poverty in after-housing income (or non-housing consumption). Estimates of a similar nature can be derived from the tables shown in this paper by combining the results in Table 8 with those in Table 7. Multiplying the results in both tables will show the relative position of the low income old to that of the middle income prime age (who dominate estimates of population medians.[21]

A comparison with the results in Table 7 also helps in interpreting the results shown in Table 8. For example, the latter shows that, among the old population, the disposable income of the bottom in Australia is relatively close to the income of the middle – though Sweden, Finland and Canada fare better in this regard. This reflects the level of the universal minimum pension in Australia, but also the fact that the denominator in this ratio (the income of the old middle) is also relatively low in that country.

With respect to inequality among the elderly, the variation in disposable income relativities between the bottom and middle is quite striking. The average income of the bottom quintile group in the US is only 36 per cent that of the middle, while the same ratio is in Sweden is 63 per cent. The generous minimum pension in Canada means that it is similar to the Nordic countries in this regard. The US and Sweden are similarly outliers when comparing the top vs the middle (Table 9).

Turning to the more comprehensive measures of living standards that take account of housing wealth we find that this reduces inequality among the elderly in some countries but not others. The consumption and full-income measures suggest that the Australian retirement housing model has been generally successful in reducing inequality among the older population, with the bottom quintile group have a consumption level of around 2/3 that of the middle – higher than in any other country. Elsewhere (Yates and Bradbury, 2010) we show that this is despite the existence of a doubly disadvantaged sub-group with low incomes and no housing wealth. One important caveat is that again, it should be noted that if account were taken of draw-downs in other forms of non-retirement wealth, this would probably benefit the middle more than the bottom and so consumption inequality would be greater than that shown here.

This makes the US result even more striking as an example of how reliance on the fourth pillar can generate an even more marked inequality of consumption in retirement. US consumption levels for the bottom quintile are only 38 per cent of those of the middle. Moreover, the ranking here is on the basis of income rather than consumption or full income. If the latter were used, the inequality would be even more striking.

This divergence between the Australian and US patterns in fourth pillar retirement provision arises from the very different patterns of own-home wealth in retirement. Though both countries have high rates of home ownership, the housing wealth holdings of the bottom income quintile in Australia are essentially the same as for the middle group, whereas they are about half that in the US (line 2 of Table 8). To put

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[21]   Estimates of income replacement for the low-income population can be found in Section 5 of
      Bradbury (2008).

this another way, the correlation between income and housing wealth is weak in Australia, but strong in the US. The strength of this correlation (and the inequalities in lifecycle wealth accumulation patterns that drive it) is crucial for determining the impact of fourth pillar savings on inequality in retirement.

**Table 8    Older population: The bottom vs the middle**

|  | Australia | Canada | UK | US | Germany | Italy | Finland | Sweden |
|---|---|---|---|---|---|---|---|---|
| (1) Disposable income | 57 | 60 | 49 | 36 | 51 | 49 | 61 | 63 |
| (2) Own home consumption | 101 | 55 | 97 | 50 | 76 | 66 | 60 | 63 |
| (3) Housing consumption | 106 | 94 | 89 | 63 | 76 | 71 | 93 | 102 |
| Housing expenditure |  |  |  |  |  |  |  |  |
| (4)   Current (rent+mort int) | 157 | 99 |  |  |  |  | 210 | 101 |
| (5)   All (rent+mort int+prin) | 152 |  | 69 | 62 |  | 66 |  |  |
| (6) Income after housing expenditure (Non-housing consumption) | 53 |  | 48 | 33 |  | 39 |  |  |
| (7) Income after current housing expenditure (Non-housing consumption + mortgage repayments) | 53 | 49 |  |  |  |  | 54 | 50 |
| Consumption = (3)+(6) | 67 |  | 59 | 38 |  | 52 |  |  |
| Full income = (3)+(7) | 67 | 60 |  |  |  |  | 61 | 62 |

Note:    Each cell shows the mean value for the bottom quintile group relative to the value for the middle three quintile groups. All measures are equivalised and the counting unit is heads and spouses. Quintiles are defined according to household equivalent disposable income (of heads and spouses).

**Table 9    Older population: The top vs the middle**

|  | Australia | Canada | UK | US | Germany | Italy | Finland | Sweden |
|---|---|---|---|---|---|---|---|---|
| (1) Disposable income | 255 | 225 | 229 | 328 | 220 | 238 | 252 | 197 |
| (2) Own home consumption | 176 | 168 | 232 | 199 | 209 | 173 | 179 | 244 |
| (3) Housing consumption | 164 | 131 | 179 | 177 | 192 | 150 | 157 | 124 |
| Housing expenditure |  |  |  |  |  |  |  |  |
| (4)   Current (rent+mort int) | 72 | 118 |  |  |  |  | 82 | 111 |
| (5)   All (rent+mort int+prin) | 80 |  | 41 | 139 |  | 167 |  |  |
| (6) Income after housing expenditure (Non-housing consumption) | 262 |  | 247 | 352 |  | 281 |  |  |
| (7) Income after current housing expenditure (Non-housing consumption + mortgage repayments) | 262 | 253 |  |  |  |  | 260 | 228 |
| Consumption = (3)+(6) | 236 |  | 228 | 320 |  | 231 |  |  |
| Full income = (3)+(7) | 236 | 225 |  |  |  |  | 242 | 203 |

## 9.  Conclusions

These countries vary considerably in the extent to which home ownership and other forms of private saving are used to support consumption in retirement. Australian and the US are the two leaders in this respect, currently with the highest rates of home ownership among the older population. However, ownership rates are high among younger cohorts in many other countries and so the experience of these two countries might provide some indication of what they might experience in the future when home ownership becomes prevalent among their post-retirement populations.

The summary indicators presented here suggest quite different patterns of consumption over the lifecycle of middle-income households and across income groups in these two countries. The US model has home ownership on top of a substantial pension system (for middle and high-income people). The Australian model has used home ownership as a replacement for a generous pension system. High land prices which, surprisingly for some, have been sustained across the recent economic crisis, have provided support for this.

In the broadest sense, the Australian model is successful in helping support post-retirement consumption. Australia has a particularly low retirement replacement rate when calculated on the basis of disposable income. Adding the imputed consumption from housing services to this, moves the replacement rate up to levels similar to those found in the other countries here. The US model, if anything, seems to over-support the living standards of the middle-income older person, with particularly high retirement replacement rates once housing consumption is included.

Though the Australian model increases total consumption in retirement, it has the potential to lead to under-consumption of non-housing goods. Several other countries (not the US though) also have a high fraction of their consumption in retirement devoted to housing consumption, but the change in consumption patterns between prime age and retirement are particularly dramatic in Australia. There, the share of consumption derived from housing services increases from 17 to 27 per cent between prime-age and retirement.[22] Taking account of draw-downs in other forms of wealth doesn't seem likely to change this conclusion significantly.

This potential problem could be alleviated if it were possible to draw upon housing wealth to finance non-housing consumption. If this is not possible, then much of the wealth value in housing will eventually pass to the next generation via inheritances – lessening its usefulness as an across-lifecycle resource transfer mechanism. However, housing markets have substantial transaction costs and mechanisms to support wealth draw-downs such as reverse mortgages and equity-sharing arrangements are only at a rudimentary stage of development. They need to be coupled with insurance mechanisms to cover longevity and caring needs risks. The private market has, so far, been unable to develop these insurance markets.

Are there broader implications for the other countries with increasing rates of private home ownership? How will this additional retirement pillar complement the existing retirement support pillars in these countries? The policy support for the 'pillars'

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[22]  The increase is also large in Sweden because of high housing expenditures in retirement.

model has stemmed from the ability of the different pillars to independently cope with different risks. Public pensions are subject to fiscal and political sustainability risks but relatively insulated from financial market risks, while private pensions and savings have the opposite characteristics.

Housing investments are, of course, subject to substantial risks – as recent events in many countries have shown. Again, as recent events have shown, these risks are often correlated with the risks facing private and public retirement funds. Paradoxically, one of the limitations of housing as a means of saving for retirement, its illiquidity, means that the volatility of housing markets are less important for retirement living standards. Once people own their home, it doesn't matter if its value plummets – they still can live in it. (The next generation of inheritors will be the ones to bear the burden of lower house values). However, housing market characteristics can have important implications for who owns their house upon entering retirement. Volatility can drive low and middle income prime-age households out of home ownership, or sustained high land prices can prevent many from entering.[23]

The very different outcomes in the two home-ownership leaders, Australia and the US, also point to the very different distributional outcomes that might occur as other countries increase their home ownership rates in retirement. The much weaker correlation between retirement income and housing wealth in Australia means that housing wealth has an equalising effect on the distribution of living standards, while the opposite is the case in the US. Generalised predictions of the impact of increasing home ownership on inequality among the aged are therefore not possible, but there is a need for further country-specific research forecasting the future interactions between retirement income packages, housing and other forms of private saving.

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[23] This is the greatest threat to the Australian model, where there is strong evidence that home ownership rates may be lower for future cohorts of retirees (Yates and Bradbury, 2010).

## 10. Appendix: Additional Data

**Table 10    Mean income, consumption and expenditure components for the middle 3 quintile groups of each age category (equivalised 2002 USD)**

| | Australia | Canada | UK | US | Germany | Italy | Finland | Sweden |
|---|---|---|---|---|---|---|---|---|
| DI: Disposable income | | | | | | | | |
| Old | 13,244 | 18,816 | 15,223 | 26,458 | 16,480 | 13,721 | 12,645 | 14,623 |
| Prime age | 24,443 | 27,515 | 24,248 | 36,059 | 22,714 | 18,516 | 19,905 | 22,713 |
| OHC: Own home consumption (5% of own-home value) | | | | | | | | |
| Old | 4,220 | 2,815 | 3,637 | 4,506 | 3,921 | 3,833 | 2,033 | 1,309 |
| Prime age | 3,799 | 2,876 | 4,817 | 4,309 | 3,813 | 4,066 | 2,340 | 2,041 |
| RentC: Rental housing consumption (rent paid + subsidies) | | | | | | | | |
| Old | 403 | 1,655 | 1,268 | 749 | 585 | 1,494 | 522 | 2,012 |
| Prime age | 585 | 1,173 | 447 | 710 | 602 | 1,651 | 453 | 1,077 |
| Housing consumption | | | | | | | | |
| Old | 4,623 | 4,470 | 4,905 | 5,255 | 4,506 | 5,327 | 2,555 | 3,321 |
| Prime age | 4,384 | 4,049 | 5,264 | 5,019 | 4,415 | 5,717 | 2,793 | 3,118 |
| RentAndMI: Rent paid plus morgage interest | | | | | | | | |
| Old | 493 | 4,007 | . | . | . | . | 551 | 3,868 |
| Prime age | 1,740 | 5,476 | . | . | . | . | 819 | 3,864 |
| RentAndMIP: Rent paid plus morgage interest and principal | | | | | | | | |
| Old | 527 | . | 1,384 | 3,030 | . | 5,180 | . | . |
| Prime age | 2,819 | . | 2,452 | 11,540 | . | 6,807 | . | . |
| Income after HX: Income after housing expenditure (DI - Rent paid - Mortgage interest - M. principal) | | | | | | | | |
| Old | 12,717 | . | 13,868 | 23,428 | . | 8,540 | . | . |
| Prime age | 21,624 | . | 21,822 | 24,519 | . | 11,709 | . | . |
| Income after CHX: Income after current housing expenditure (DI - Rent paid - Mortgage interest) | | | | | | | | |
| Old | 12,751 | 14,809 | . | . | . | . | 12,094 | 10,755 |
| Prime age | 22,703 | 22,039 | . | . | . | . | 19,087 | 18,849 |
| Consumption: (Income after HX + OHC + RentC) | | | | | | | | |
| Old | 17,339 | . | 18,861 | 28,683 | . | 13,868 | . | . |
| Prime age | 26,009 | . | 27,133 | 29,537 | . | 17,427 | . | . |
| Full income: (IncomeAfterCHX + OHC + RentC) | | | | | | | | |
| Old | 17,373 | 19,279 | . | . | . | . | 14,649 | 14,076 |
| Prime age | 27,088 | 26,088 | . | . | . | . | 21,879 | 21,967 |

Source: Australia, Australian Bureau of Statistics 2003-04 Household Income and Expenditure Survey, confidentialised unit record file. Other countries, Luxembourg Wealth Study (LWS).

Notes    The table shows the mean equivalent income component averaged across household heads and spouses. Note UK data does not add up because of missing data on housing expenditures for a small fraction of households. German housing cost data is excluded because of large numbers of cases with missing data.

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