



International Actuarial Association  
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# Interaction Between Pension and Housing

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## Interactions Between Pension and Housing

This Discussion Paper (paper) was prepared by the Population Issues Working Group (PIWG) of the International Actuarial Association (IAA).

The lead author was Martin Stevenson. Other contributors included Morteza Aalabaf, Yair Babad, Assia Billig, Ted Goldman, Dermot Grenham and Sam Gutterman. Constructive comments were made by other members of the PIWG and the Scientific Committee.

This paper has been approved for publication by the PIWG and the Scientific Committee of the IAA.

The IAA is the worldwide association of professional actuarial associations, with several special interest sections and working groups for individual actuaries. The IAA exists to encourage the development of a global profession, acknowledged as technically competent and professionally reliable, which will ensure that the public interest is served.

The role of the PIWG is to identify population issues of particular interest to actuaries and in respect of which the actuarial profession, at an international or national level, could make a useful contribution in the public interest.

The views expressed in this paper are not necessarily the views of the IAA.



International Actuarial Association  
Association Actuarielle Internationale

**Tel:** +1-613-236-0886 **Fax:** +1-613-236-1386

**Email:** [secretariat@actuaries.org](mailto:secretariat@actuaries.org)

1203-99 Metcalfe, Ottawa ON K1P 6L7 Canada

[www.actuaries.org](http://www.actuaries.org)

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## 1. Introduction

This paper discusses the current trends of Retirement Income Systems in several developed countries. It then explores the characteristics of the housing markets in these countries. The paper's objectives include an exploration of the role of housing in providing retirement wealth and income. It sets out instances where consideration of both pensions and housing simultaneously can lead to favourable outcomes.

It is hoped that this paper will encourage a long-term broadening of actuarial activity in three areas. First, that actuaries already involved in Retirement Income Systems (both as practitioners and influencers of public policy) will incorporate housing into their framework, along with pensions and social security arrangements. Second, that those actuaries that advise individuals on pension issues will also consider housing implications. Third, while there are a small number of actuaries already involved with housing (for example, through bank financing), there is scope for significantly more actuarial involvement in the many facets of housing, such as financing (current and innovative), supply and demand, taxation and social issues. It is also hoped that increased public discussion will be held regarding the relationship between housing and Retirement Income Systems.

Retirement Income Systems can be described in a number of ways. One description involves four pillars: (a) social security programs, (b) mandatory employer-sponsored pension plans, (c) voluntary pension plans, homes and other personal savings, and (d) work income. Their relative importance depends upon the country and individual. Although actuaries have played prominent positions in the domains of pensions and social security, a retiree's living arrangements (home ownership<sup>1</sup> or affordable rental, including rebates and subsidies) can be at least as important for retirement outcomes.

Retirement Income Systems broadly have two aims: to enable retirees to enjoy an adequate standard of living and to alleviate poverty in old age. They are currently under stress as a result of low fertility, decreasing mortality rates of retirees and past and potential low real investment returns.

In many circumstances, home ownership is a critical element for attaining the overall goals of Retirement Income Systems. Moreover, the amount of wealth in an owned home can exceed that held in pension funds and other personal savings, often by a significant margin. Home ownership is widespread around the globe, particularly for those at or near retirement. Nevertheless, three recent trends are of potential concern: an increasing number of individuals entering retirement with mortgages and other debt, a decline in home ownership by the young and home prices that are increasing significantly faster than wage increases. Although some of these trends, such as the

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<sup>1</sup> *Home ownership* here refers to the place of residence, and does not include real estate used for income and investment. *Home ownership* includes long-term, affordable rental arrangements with laws that protect renters from evacuation and non-regulated rent increases.

rapid increase in house prices, will not continue indefinitely, their effects may remain for many years.

Housing, pensions and other forms of wealth are distributed unevenly in the population. It is the second, third and fourth quintiles of wealth distribution that provide the greatest opportunities for interaction between pensions and housing to enable better ultimate outcomes. People in the first (i.e. lowest) quintile are the least likely to own their own homes and are most likely to need state assistance in retirement. In contrast, members of the fifth quintile are financially secure. In general, this paper does not explore state-based approaches, such as housing subsidies and/or rent assistance. It is mainly concerned with the inter-relationship of housing and pension plans.

## **2. Description of retirement income systems**

Retirement Income Systems can be described in a number of ways. As mentioned above, one description is a four-pillar format, as follows:

*Pillar 1:* A state-run universal pension system, which offers basic coverage and often has a focus on reducing poverty. Pillar 1 is usually referred to as “social security”.

*Pillar 2:* A funded or partially funded mandatory system that employees and employers pay into; this includes contributory social insurance plans, mandatory occupational pension funds and mandated defined contribution or defined benefits arrangements.

*Pillar 3:* Voluntary occupational pension plans and voluntary private funded accounts, including voluntary contributions to pension plans, individual savings plans and insurance policies with a savings component.

*Pillar 4:* Although outside the scope of this paper, there is an increasing trend for people to work longer as a means of supplementing income post retirement from full-time work (see Population Issues Working Group, 2016).

There are essentially two aims of Retirement Income Systems:

1. Alleviate poverty in old age, which is primarily undertaken within Pillar 1; and
2. Allow retirees to enjoy an adequate standard of living post retirement commensurate with their pre-retirement standard of living. The attainment of this is generally the objective of Pillars 2 and 3, with residual support from Pillar 4, after taking into account the level of support provided by Pillar 1.

### **3. Global pressures on retirement income systems**

Many social security and social insurance arrangements are funded on a pay-as-you-go approach or are partially unfunded. That is, taxes and contributions from the current working population and program sponsors, if any, directly provide benefits for the current retired population. Thus, their viability (financial soundness) is directly related to the relationship between the number of beneficiaries and the number of people in the workforce who pay taxes/contributions; the so-called old-age dependency ratio<sup>2</sup>). All other things being equal, the higher the old-age dependency ratio, the greater the financial stress on unfunded systems.

There are two main drivers of the level of the old-age dependency ratio. Low fertility increases the ratio because the number of people entering the workforce will decline. Reduction in mortality rates for those at higher ages also increases the ratio because the number of people in the retired group increases compared to the position where mortality rates are stable. (Net immigration can also change the old-age dependency ratio, but the effect is country-specific rather than being a global trend.)

Pillars 2 and 3 (and sometimes part of Pillar 1) are generally funded to a certain extent. That is, their benefits are provided by pre-paid contributions plus any investment earnings. The viability of funded arrangements depends upon rates of real investment return (net of expenses) and upon the rates of mortality of retirees. The lower the rates of real investment return and the lower the rates of mortality of retirees, the greater the cost for a given level of pension benefits (defined benefit plans) or the lower the total level of benefits (defined contribution plans).

Another pressure comes from the lower level of interest rates at the time of annuitization of defined contribution accounts. The lower the interest rates, the lower the levels of benefits.

Thus, other than the level of benefits and extent of coverage, five main determinants of financial soundness of Retirement Income Systems are:

- Rates of fertility;
- Rates of mortality of retirees;
- The old-age dependency ratio (a function of the first two parameters);
- Rates of real investment return net of expenses; and
- Level of interest rates.

All five determinants have moved unfavourably in many countries in recent times. (The information in the next three paragraphs is sourced from Population Issues Working Group, 2016.)

In respect to fertility rates, on average, in more developed countries the number of children per female over her lifetime has declined from 2.8 children in the 1950s to about 1.6 children at the beginning of the 2000s. Since then, a slight decrease in fertility has been seen in many of these countries. Most national and international agencies have projected a relatively stable fertility rate

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<sup>2</sup> The old-age dependency ratio is often expressed as the percentage of those aged 65-plus per 100 people to those between the ages of 15 and 65.

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for these countries, below 2.0 children per female in most cases. The fertility decline has been more pronounced in many less developed countries, with, on average, a fall from 6.1 children in the 1950s to 2.7 children from 2005 to 2010. The overall decrease in fertility is expected to continue.

In respect of mortality of retirees, globally, in the period from 1950 to 2010 the life expectancy of a 60-year-old has broadly increased on average from 14 to 20 years.

The inevitable effect of lower rates of fertility and lower rates of mortality of retirees has been an increase in the global old-age dependency ratio. Between 1970 and 2015 it increased from 9.2 percent to 12.6 percent. This trend is even more pronounced in developed countries.

Finally, adverse stock market returns during the period from 2007 to 2009 and the resulting global economic downturn (sometimes called the “global financial crisis” or “great recession”), sluggish rebound of markets to pre-crash levels (indeed, in some countries pre-crash levels have still not been achieved) and the long-term trend of interest-reduction steps by central banks have contributed heavily to financial stress on Retirement Income Systems. One of the enduring legacies of this period in many countries has been very low interest rates, and while they have boosted returns for some asset classes in the short term, they may provide a dampening effect on future investment returns.

The trends identified here of lower rates of fertility, lower mortality rates for retirees, higher old-age dependency ratios and subdued investment returns have resulted in financial stresses on Retirement Income Systems in many countries, which have resulted in pressure on either contribution or benefit levels.

One further significant trend in relation to Retirement Income Systems in many markets has been a switch from defined benefit arrangements to defined contribution programs, which has placed more financial responsibility on the individual.

## **4. Importance of housing**

Access to affordable housing (shelter) is fundamental to the achievement of the two over-arching goals of Retirement Income Systems: to reduce poverty and enable retirees to maintain an adequate standard of living.

The benefits of affordable housing are well summarized in an Australian report (Productivity Commission, 2004):

Access to affordable and quality housing is central to community wellbeing. Apart from meeting the basic need for shelter, it provides a foundation for family and social stability, and contributes to improved health and education outcomes and a productive workforce. Thus, it enhances both economic performance and social capital.

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Further, the Productivity Commission in a later report (Productivity Commission, 2015) indicated: “Renting in old age is associated with a number of potential risks, including poverty, homelessness and adverse impacts upon mental health and wellbeing.”

An example of the quantification of the effect of housing and its relationship to pension funding can be found in Australia, where the foremost pension industry association in Australia, the Association of Superannuation Funds of Australia (ASFA), produces a quarterly report. It shows the amount of income that retirees need to provide for a comfortable standard of living, and the amount needed to save to achieve that income. One of the assumptions underlying its calculations is that the retiree owns his or her home.

For the December 2016 quarter edition, the ASFA also estimates the effect of renting in Sydney. For retirees owning their own home, the amount needed to be saved for a comfortable standard of living, according to ASFA calculations, was AUS\$545,000 for a single person and AUS\$640,000 for a couple. In contrast, for retirees who rent instead, the corresponding amounts were AUS\$1,045,000 and AUS\$1,166,000, respectively (ASFA, n.d.).

## **5. The financial significance of housing**

In most countries, housing is the most significant asset held by the population. Examples from various countries include:

### **Pensions and housing wealth as a multiple of GDP, 2016**

<b>Country</b>	<b>Pension assets<sup>1</sup></b>	<b>Gross housing assets</b>	<b>Net housing assets (i.e., after deducting mortgage debt)</b>
<b>Australia</b>	1.2	3.7 <sup>2</sup>	2.8 <sup>2</sup>
<b>Singapore</b>	0.8	2.1 <sup>3</sup>	1.5 <sup>3</sup>
<b>UK</b>	1.0	2.4 <sup>4</sup>	2.0 <sup>4</sup>
<b>U.S.</b>	1.3	1.2 <sup>5</sup>	0.7 <sup>5</sup>

*Notes: 1. OECD, 2017. 2. Australian Bureau of Statistics, 2016 & 2017b. 3. Phang and Heble, 2016. 4. Savill Newsletter, 2017. 5. U.S. Federal Reserve Board, Financial Accounts of the United States, n.d.*

### **Distribution of housing and other wealth**

As one would expect, there is a wide variation in the level of wealth between different socio-economic groups.

In the U.S., the median home equity and financial wealth of households aged 65 to 69 in 2012 by wealth quintile, is set out in the following table:



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### **Distribution of wealth of U.S. households, aged 65 to 69**

<b>Wealth quintile</b>	<b>Net financial wealth (excluding home equity) US\$'000</b>	<b>Home equity US\$'000</b>
<b>First</b>	0	0
<b>Second</b>	5	60
<b>Third</b>	40	105
<b>Fourth</b>	175	175
<b>Fifth</b>	1,150	330

*Source: U.S. Board of Governors of the Federal Reserve System, 2013.*

In Australia, the average (mean) is shown for all households, for 2015 to 2016:

### **Distribution of wealth of Australian households**

<b>Wealth quintile</b>	<b>Net financial wealth (excluding home equity) AUS\$'000</b>	<b>Home equity AUS\$'000</b>
<b>First</b>	28	0
<b>Second</b>	98	84
<b>Third</b>	141	306
<b>Fourth</b>	295	552
<b>Fifth</b>	1,342	1,450

*Source: Australian Bureau of Statistics, 2017b.*

The broad conclusion from the two sets of statistics is the same: people in the lower quintile are likely to require financial assistance from the state; and people in the highest quintile are financially secure. However, for people in the second to fourth quintile, optimizing wealth between pensions and housing is worthy of consideration.

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### **Level of home ownership**

Prevalence of home ownership is high in many countries. Note that home ownership is defined as the percentage of homes that are occupied by the owner (and household):

### **Level of home ownership by country**

Country	% of home ownership	Country	% of home ownership	Country	% of home ownership
Romania	96.0	Czech Rep	78.2	Euro area	66.4
Singapore	90.9	Iceland	77.8	Sweden	65.2
Macedonia	90.6	Spain	77.8	New Zealand	64.8
Croatia	90.1	Mexico	76.4	France	64.1
China	90.0	Slovenia	75.1	U.S.	63.7
Slovakia	89.5	Portugal	74.8	UK	63.5
Lithuania	89.4	Greece	73.9	Denmark	62.0
Mauritius	88.9	Brazil	73.5	Japan	61.9
Russia	87.1	Luxemburg	73.2	Turkey	60.7
Hungary	86.3	Cyprus	73.0	South Korea	56.8
Nepal	85.3	Italy	72.9	Austria	55.0
Poland	83.7	Finland	71.6	Germany	51.9
Norway	82.7	Belgium	71.3	Hong Kong	50.4
Bulgaria	82.3	Ireland	70.0	Ghana	47.2
Estonia	81.5	EU	69.5	Switzerland	43.4
Serbia	81.1	Netherlands	69.0		
Latvia	80.9	Australia	67.0		
Malta	80.8	Canada	66.5		

Source: Trading Economics, n.d.

### **Trends in home ownership**

Around the world there are different trends in home ownership. In many countries, a declining trend in homeownership was observed. In others, the level of ownership is either stable or increasing. Some examples of countries for which data are available are provided below.

#### ***Australia***

Australia generally has exhibited a trend of declining home ownership, particularly among younger people and the prime-working-age population:

#### **Level of home ownership – Australia**

<b>Age</b>	<b>1981</b>	<b>1991</b>	<b>2006</b>	<b>2016</b>
	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>
<b>15–24</b>	25	24	24	23
<b>25–34</b>	61	56	51	45
<b>35–44</b>	75	74	69	62
<b>45–54</b>	79	81	78	72
<b>55–64</b>	81	84	82	78
<b>65 plus</b>	78	84	82	82
<b>Total</b>	70	72	70	67

*Source: Census 2016 and earlier years, via Judith Yates, University of Sydney.*

As can be seen above, home ownership is currently about 80 percent for retirees. However, it is projected to fall to 55 percent by the middle of the century (Senate Economics Reference Committee, 2015).

#### ***New Zealand***

A similar trend of declining home ownership is also evident in New Zealand, particularly among the younger age cohorts.

**Level of home ownership – New Zealand**

<b>Age group</b>	<b>2001</b>	<b>2006</b>	<b>2013</b>
	<b>%</b>	<b>%</b>	<b>%</b>
<b>25–29</b>	26	23	18
<b>30–34</b>	48	44	36
<b>35–39</b>	61	57	50
<b>40–44</b>	69	65	58
<b>45–49</b>	74	71	64
<b>50–54</b>	78	75	68

*Source: Stats NZ, n.d.*

***United Kingdom***

The trend of declining home ownership is also evident in the UK.

**Level of home ownership – UK**

<b>Age group</b>	<b>2005/06</b>	<b>2015/16</b>
	<b>%</b>	<b>%</b>
<b>16–24</b>	20	10
<b>25–34</b>	56	36
<b>35–44</b>	71	57
<b>45–54</b>	77	69
<b>55–64</b>	79	74
<b>65+</b>	81	77

*Source: Department of Works & Pensions, 2017.*

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### ***Israel***

Israel also shows a trend of declining home ownership among the young.

#### **Level of home ownership – Israel**

<b>Age group</b>	<b>1997 %</b>	<b>2015 %</b>
<b>20–29</b>	52.3	49.9
<b>30–39</b>	68.7	55.3
<b>40–49</b>	78.7	71.6
<b>50–59</b>	81.2	80.1
<b>60+</b>	72.1	78.3
<b>All ages</b>	70.2	67.6

*Source: Israeli Central Bureau of Statistics, 2018*

### ***United States***

In the U.S., the level of home ownership has been relatively stable, but the extent of outright home ownership has declined.

#### **Level of home ownership – U.S.**

	<b>1983</b>	<b>2013</b>
<b>Under age 65</b>		
<b>% own homes</b>	58.1	53.6
<b>% own homes without mortgage</b>	17.7	12.0
<b>Over age 65</b>		
<b>% own homes</b>	74.6	72.0
<b>% own homes without mortgage</b>	64.9	47.7

*Source: Author's calculations and U.S. Board of Governors of the Federal Reserve System, 1983 & 2013.*

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### **Canada**

Overall home ownership rates have increased in Canada.

#### **Level of home ownership – Canada**

<b>Year</b>	<b>Home ownership rate %</b>
<b>1971</b>	60.3
<b>1976</b>	61.8
<b>1981</b>	62.1
<b>1986</b>	62.4
<b>1991</b>	62.6
<b>1996</b>	63.6
<b>2001</b>	65.8
<b>2006</b>	68.4
<b>2011</b>	69.0

*Source: Statistics Canada, 2015.*

### **Singapore**

In Singapore, resident home ownership rates have been reasonably stable.

#### **Level of home ownership – Singapore**

<b>Year</b>	<b>Home ownership rate %</b>
<b>1990</b>	87.5
<b>2000</b>	92.0
<b>2010</b>	87.2
<b>2015</b>	90.3

*Source: Phang and Heble, 2016.*

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In those countries where home ownership among the young is declining, there is anecdotal evidence that the position is worse than revealed by the statistics: many young people are only able to achieve home ownership because of material financial support from their parents.

### **Trends in house prices**

In recent years price increases have tended to greatly outstrip wage increases. The following table compares house price increases in the five years from 2012 to 2017.

### **Comparison of nominal home prices and wages, 2012–2017**

<b>Country</b>	<b>Increase in home prices %</b>	<b>Increase in wages %</b>	<b>Sources</b>
<b>Australia</b>	45.9	13.2	1, 2
<b>Canada</b>	48.3	8.9	3, 4
<b>Hong Kong</b>	53.1	23.9	5, 6
<b>UK</b>	33.3	10.2	7, 8
<b>U.S.</b>	34.6	13.2	9, 10

*Sources: 1. Australian Bureau of Statistics, 2017c. 2. Australian Bureau of Statistics, 2017a. 3. Canadian Real Estate Association, 2019. 4. Statistics Canada, n.d. (Average Weekly Earnings, 2012–2017 average October to September). 5. Government of Hong Kong, n.d.a. 6. Government of Hong Kong, n.d.b. 7. HM Land Registry, 2017. 8. Office for National Statistics, 2018. 9. Federal Housing Finance Agency, n.d. 10. Social Security Administration, n.d.*

In some property “hot spots”, price increases of houses have been even more dramatic. For example, over the 2012 to 2017 period, house prices in Sydney increased by 74.2 percent, compared to the Australian average of 45.9 percent. House prices in Greater Vancouver increased by 76.1 percent compared to the Canadian average of 48.3 percent. There were similar effects in Israel, where the largest increases in house prices occurred in the main cities rather than the periphery.

Further information in respect of house prices can be found at [www.imf.org/external/research/housing/index.htm](http://www.imf.org/external/research/housing/index.htm).

## **6. Reverse mortgages**

### **Introduction**

Many retirees have inadequate retirement incomes but have very large financial equity in their home. An obvious course of action for them would be to release part of this equity to increase post-retirement income. One possible release method is a reverse mortgage, termed “equity release” in some countries or “home equity conversion mortgage” in others.

### **Features of reverse mortgages**

The main features of and relating to reverse mortgages are:

1. A reverse mortgage enables an individual to borrow against the value of his or her home. The loan accumulates with interest and is repaid from the proceeds of the sale on termination of the contract.
2. The borrower has to be above a certain age.
3. The maximum amount that can be borrowed (loan-to-value ratio) increases with age.
4. Payments are usually made as a lump sum, which can meet some financial needs. If the aim is to supplement the first three pillars, then income payments (for life or a fixed term) are preferable (referred to as an income reverse mortgage). A reverse mortgage can also serve as a line of credit.
5. A no-negative-equity guarantee is a valuable feature to be included in a reverse mortgage. This guarantee ensures that the final total repayment of the borrower is capped at the realized value of the mortgaged property.
6. Potential participants must be provided with such education, legal advice and financial advice as is relevant to the decision to affect a reverse mortgage.
7. Tax and social security implications are important. For example, in Australia, the residential home is exempt from means testing for eligibility for social security benefits, but the lump-sum proceeds of a reverse mortgage are not exempt.

### **Barriers to reverse mortgages**

Reverse mortgages have not been popular in most countries in the past. From the demand side, there are many reasons why this is so:

- Aversion to debt. Many people have spent decades paying off home mortgages. For these people the thought of going back into debt through a reverse mortgage is anathema. This is especially the case for people working and still paying off a traditional mortgage. However, retirees with little or no traditional debt can often see the advantage of a reverse mortgage, even if it is not their desired approach for funding retirement;
- Past scandals leading to (possibly unfair) stigmatization. Issues have included debt exceeding home equity (before no-negative-equity guarantees were introduced), aggressive sales tactics and premature foreclosures;
- Desire to preserve home equity for personal catastrophes or long-term care provision;
- Desire to leave a bequest;
- Uncertainty about future interest or other costs;



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- Level of expenses and lack of transparency of reverse mortgage products; and
- Low availability/awareness of products.

From the supply side, disadvantages have included longevity uncertainty, the risk of falling house prices and reputational risk (see the second bullet point above).

### **Current low take-up of reverse mortgages**

Currently, reverse mortgages are not widespread. Some examples follow.

Australia: The reverse mortgage market is about 1–2 percent of properties of home owners aged 65 and over. The value of outstanding reverse mortgages is 0.4 percent of the value of property owned by older Australians (Productivity Commission, 2015).

Canada: Reverse mortgages have been available for over 30 years in Canada, but usage is limited. However, from a low base there has been a significant increase in the past few years. The Office of the Superintendent of Financial Institutions recently determined that outstanding reverse mortgage credit reached \$2.69 billion, a 44.6 percent increase from the previous year. (which mortgage, n.d.)

Hong Kong: The government introduced a reverse mortgage scheme in 1997 for elderly property owners.

Singapore: The government assists elderly home owners to monetize their housing units, but not through reverse mortgages. See later in this paper.

UK: Annual lending is £2.15 billion compared with housing equity of £1.8 trillion for people aged over 55 (Equity Release Council, 2017). While small, this represents a rapid increase from a level of £788 million in 2011.

U.S.: Current penetration is less than 2 percent of all households, but 12 to 14 percent of all retired households are suitable for, and might sensibly use, a reverse mortgage option (Warshawsky, 2017). Note that in the U.S., the federal government provides backing for lenders who offer this product, if certain criteria are met.

### **Opportunities for reverse mortgages**

With increasing financial stress on pension funds and social security systems, limited personal savings for many and the rapid rise in home prices in many geographies, the future may see an upsurge in the take-up of reverse mortgages.

A simple example of how this might work in practice in Australia is to consider a single person with a pension account balance of AUS\$200,000, living in a home valued at AUS\$1,000,000 (not atypical values for Sydney or Melbourne). The pension account balance, combined with the social security (Old Age) pension, is expected to provide an indexed income stream of AUS\$36,700 per annum. Suppose that this person wishes to receive an income of AUS\$42,893 per annum. (At the date of calculation this was the ASFA comfortable standard – a widely used benchmark in Australia. See

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also the previous section “Importance of housing”.) This could be achieved through an income reverse mortgage with a drawdown of AUS\$6,193 per annum, Consumer Price Increase indexed. Twenty-five years from the commencement of the reverse mortgage, the reverse mortgage debt is expected to be AUS\$444,000 and the value of the home is expected to be AUS\$3,386,000, leaving AUS\$2,942,000 of home equity. In this example, the retiree has attained the desired standard of living and still has sufficient home equity remaining for an aged-care accommodation payment and/or a bequest. (Main assumptions: rate of investment return on pension account balance 5.75 percent per annum; rate of increase in inflation 2.5 percent per annum; rate of increase in value of home 5 percent per annum; rate of interest of reverse mortgage 6.0 percent per annum; rate of increase in Old Age pension 3.5 percent per annum. Amounts shown are in Australian nominal dollars.)

The key variable in this example is the rate of increase in house prices. The base value of 5 percent per annum was chosen as being representative of past house increases in Australia (Australian Bureau of Statistics, 2017c). A conservative assumption is that house prices increase at the rate of inflation – assumed here at 2.5 percent per annum. With this alternative assumption, the value of the home at the end of the 25 years is \$1,854,000 and the remaining equity is \$1,410,000, which is still a satisfactory outcome.

Academic literature supports the proposition that individuals gain utility<sup>3</sup> from (fairly priced) reverse mortgages. See, for example, Hanewald et al. (2016), which finds that higher utility results from loan-to-value ratios in excess of 50 percent with take-up early in retirement.

Another paper (Pfau et al., 2017) emphasizes the flexibility of reverse mortgages in retirement planning. Reverse mortgages can be used to:

- Delay taking (U.S.) Social Security benefits, thereby increasing their level;
- Increase monthly income in predictable ways through regular payments;
- Increase accessible wealth, to be used for unforeseen emergencies or long-term care expenses; or
- Reduce downside volatility and the chance that total income will fall below specified thresholds.

The latter paper also points out that reverse mortgages are more appropriate for retirees who intend to stay in their home for an extended period.

Very recently the Australian Government introduced a reverse mortgage arrangement, known as the Pensions Loan Scheme. This scheme is open to all Australians over pension age. People may borrow against the equity in their family home or investment property. The money can only be borrowed as an income stream and not as a lump sum. The maximum annual income stream (initially) is \$17,800 for a couple or \$11,800 for a single person. The interest rate charged is 5.25 percent per annum (Australian Budget, 2018 -19).

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<sup>3</sup> *Utility* here means maximizing lifetime consumption and bequest, taking into account a subjective discount factor of the individual and relative risk aversion.

Another recent development is that the Chinese Banking and Insurance Regulatory Commission has expanded the reverse mortgage pension program to the whole country (Sixth Tone, 2018). Reverse mortgages had been introduced in 2015. The program was expanded in 2016 to selected cities. The program is intended to meet the retirement needs of the elderly.

## **7. Other home equity release mechanisms**

There are methods other than reverse mortgages to utilize home equity to improve retirement outcomes.

One approach is simply to downsize; i.e., selling the existing home and buying a less expensive dwelling, with the difference being used to boost post-retirement living standards. This approach may be particularly suitable for families where the children have moved away and the home becomes too big for the retiring couple (or single parent). Although this may be a suitable approach for many retirees, there are material disadvantages. Firstly, it means the retiree(s) may move away from the family home and the neighbourhood where they have many social contacts. Secondly, there are considerable frictional costs (buying and selling residences).

Another approach is to sell a portion of the equity in the house. A home can be regarded as part life-interest and part reversionary interest. The debt-free equity can be released by selling part of the reversionary interest. Such home reversionary products have the advantage that the home owner has certainty about the final outcome: that he/she will be entitled to a fixed percentage of the proceeds when the house is eventually sold. However, the take-up of home reversionary products is considerably lower than the reverse mortgage market.

### **Interaction**

In a defined contribution world with improving longevity and potentially reduced investment returns, and with financially stressed social security systems, it is increasingly difficult for retirees to enjoy an adequate standard of living in retirement. A recent survey (American Academy of Actuaries et al., 2017) of pre-retirees in Australia, the UK and the U.S. reported that 58 percent of respondents expect to have a poor or modest lifestyle during retirement.

In contrast, for the current generation of retirees home ownership is at a high level in countries with a robust housing market. These conditions are favourable for home equity to be released to enhance income in retirement. This is an opportunity for financial advisers and institutions to make retirees aware of the opportunities, and for retirees to incorporate housing as a financial asset that can improve their retirement income outcomes.

## **8. Use of pension accounts to help young people purchase a home**

### **Introduction**

While older people can benefit from high house equity to offset inadequate retirement income, young people can suffer from rapidly rising home prices and stagnant wage levels that make it very difficult to afford a deposit for a home.

Under these circumstances, it can make sense for members of pension funds to apply their pension balances to a home deposit to purchase a home.

If utilizing a pension fund balance can make the difference between being able to purchase a home and not affording a home deposit, then the application of the balance in this way may improve the person's retirement outcome, compared to retaining the balance in the fund to accumulate to retirement.

Note that it is not claimed that people should automatically access pension balances for housing purposes. Many people can afford a deposit for a home without additional assistance. For others, renting can provide a more flexible lifestyle, and in some cases may be financially advantageous compared to buying.

### **Example**

A simplified, specific example shows how accessing a pension balance for housing purposes might work in practice. In Australia, employers must contribute to a pension fund for all employees. It is intended that the rate of contribution will eventually be 12 percent of salaries. Consider a person earning AUS\$72,000 per annum, which is a level between average earnings and average full time earnings (Australia Bureau of Statistics, 2017a). If a typical member makes no withdrawal from his/her pension fund, then the end balance would be AUS\$507,000 in real terms. Alternatively, if the member was permitted to remove the balance of AUS\$44,000 after six years of membership and use it for a deposit (or partial deposit) on a home, then the end balance would be AUS\$410,000. It is clear that AUS\$410,000 plus a home is a better outcome than AUS\$507,000 with no home. (Main assumptions: rate of increase in prices of 2.5 percent per annum, rate of increase in salaries of 3.5 percent per annum, rate of investment return of 5.75 percent per annum.) The other side of the equation is that in the no-home scenario the member is paying rent during his/her working lifetime, whereas in the purchase scenario the member is paying off the mortgage and incurs property and maintenance expenses. In practice, in many instances any difference in these payments will be reflected in consumption during employment rather than being saved for retirement.

A considerably more rigorous approach is taken in an unpublished paper (Xu et al., 2016). The authors consider the question of the optimal time to become a home owner. They examine this question by looking at how purchasing home property at different ages affects an individual's pre-retirement consumption and retirement savings, and ultimately the lifetime utility level.

The paper notes:

Our simulation results show that purchasing the property earlier during the working life often leads to a higher level of wealth at retirement due to a higher home equity value and more liquid assets . . . The downside of purchasing the property relates to the dramatic consumption drop that lasts for a few years. A significant proportion of liquid assets are locked in the housing wealth (which is illiquid) after a large amount of down payment is made. The consumption cut results in utility loss, and the earlier the property is purchased, the higher the discounted utility loss. On the other end of the spectrum is to keep renting during the working life. We find it unattractive both in terms of retirement wealth and utility level. Individuals who rent the property throughout the working life have to incur high rental costs. This not only constrains the spending on non-housing consumption, which results in a low utility level, but also slows down the wealth accumulation.

It would be interesting to extend the analysis to using part of a person's pension balance to a home deposit, particularly at younger ages.

### **Factors to be considered**

In respect of using pension balances for assisting people to buy houses, there are a number of issues to consider.

1. As stated earlier, one of the core aims of Retirement Income Systems is to provide retirees with an adequate income in retirement. Outright home ownership, which generally significantly reduces housing costs, is consistent with this objective. In a number of countries, home ownership also enhances dignity in retirement.
2. Financially, outright home ownership is an income stream in retirement, in the sense that it reduces expenditure that is otherwise payable by people renting or paying off a mortgage. In this sense it is a mitigant against longevity risk (lasting through life), investment risk (the savings are less volatile; the value of residential property has traditionally been relatively stable compared to many financial assets) and inflation risk (i.e., protection against rents rising, although inflation risk still exists through property taxes, insurance, utilities and cost of maintenance).
3. Potential participants need to be provided with relevant education/financial advice. Any financial plan developed needs to consider important expected financial factors, including tax and social security of the relevant jurisdiction.
4. An assessment needs to be made as to whether the implied rate of return of using pension monies for housing is satisfactory. This assessment will need to take into account financial and economic conditions, and the tax and social security environment, as well as the individual's job situation.
5. Generally, young people have not been engaged with pension funding. However, most young people do have an interest in obtaining a home. Hence, allowing pension monies to be used for a housing deposit is likely to achieve interest in pension funding throughout working lifetimes.
6. Investment in a house enables leverage to be obtained (i.e., people borrow a high proportion of the purchase price of a home), whereas this is generally not possible in a pension fund.

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This leveraging is likely to increase both investment return and the member's overall level of saving. However, as always, leveraging increases investment risk.

7. Restrictions should be applied to any arrangement where pension fund balances can be used for housing purposes. The aim of such a feature is to help people enter into the home ownership market, and hence eligibility should generally be restricted to first-home buyers/occupiers. Also, the amount that can be utilized should be capped, so that end retirement balances are not overly reduced.
8. It is sometimes argued that allowing members to use pension balances for housing will not benefit members; rather, it will increase house prices and hence benefit existing home owners and developers. Counter-arguments include: (1) this is a relatively minor impact, as there have been many housing booms and busts that have occurred independently of any housing grant schemes; (2) the class that the proposal will apply to – first-time owners/occupiers – is less likely to precipitate a material increase in housing prices compared to other groups such as investors and owners upsizing and downsizing; (3) in the view of the Productivity Commission (2004) there are not only benefits to members in the short term, but also in the longer term – the price impact will be reduced as higher demand will lead to more production that will lead to a stabilization of prices; and (4) housing will be needed, whether for rent or for purchase.
9. Another argument often put forward by those opposed to the idea of using pension accounts for housing purposes is that there will be pressure for other purposes (e.g., repayment of education debts). The counter-argument is that housing has a particular niche, in that it becomes part of a person's assets that can be used in his/her post-retirement framework.
10. Policymakers considering the introduction or amendment of a scheme to allow pension accounts to be used for housing need to take into account the above factors. In addition, extensive modelling of different structures should be undertaken before determining the preferred approach. The modelling needs to take into account a range of issues, including:
  - The macro effects on pension cash flows and funds under management;
  - The micro effects for a range of individuals' retirement outcomes;
  - The effect on government revenue (including taxes and social security);
  - The macro effects on the housing market;
  - The micro effects for individuals in respect of their housing, income and savings outcomes; and
  - Any other economic flow-on effects.

### **Practice**

The following are examples of pension balances being used for housing purposes.

Australia: All employers must provide "Superannuation Guarantee" contributions to a pension fund for all employees. Currently these contributions are 9.5 percent of salaries. There are no opt-out provisions.

On 1 July 2017, the First Home Super Saver Scheme was introduced. Under this scheme, individuals can make voluntary contributions (in excess of the employer's Superannuation Guarantee contributions) up to AUS \$15,000 per year (AUS \$30,000 in total) to their pension accounts to

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purchase a first home (ATO, 2017). For most people, the scheme will boost the savings that can be put toward a deposit by at least 30 percent compared with savings through a standard deposit account. This is due to the concessional tax treatment and the higher rate of earnings often realised in the pension environment.

Canada: The Canadian government's Home Buyers' Plan (HBP) allows first-home buyers to borrow up to \$25,000 from their individual tax-assisted Registered Retirement Savings Plan for a down payment, tax-free. However, since the HBP is considered a loan, it must be repaid within 15 years. No interest is charged. (Investopedia, 2018)

New Zealand: KiwiSaver is a national defined contribution pension fund. There is compulsory enrolment of employees by employers, but employees may opt out.

After three years' membership, a person may be entitled to a KiwiSaver Home Start Grant. The maximum grant is NZ\$10,000 per person. The grant is available for first-home buyers/occupiers only and is limited to those with incomes of less than NZ\$85,000 per annum. (KiwiSaver, n.d.)

Singapore: The Central Provident Fund pays out more for housing purposes than for retirement. Full details are set out in a later section.

UK: Individuals can invest in a Lifetime ISA (Individual Savings Account) to buy a first home or to save for retirement. New joiners must be over 18 and under 40. Contributions up to a maximum of £4,000 per annum may be made up to age 50. Monies withdrawn for a first home (with a value of £450,000 or less) or for retirement attract a 25 percent government bonus, up to a maximum of £1,000 per annum. (Gov.UK, 2017)

U.S.: No such arrangements exist.

## **9. Mortgage disintermediation**

### **Overview**

Pension funds generally do not invest in mortgages on residential property. Rather, they invest significant amounts in tranches of banks' financial offerings (deposits, fixed-term securities and equity), where a large part of the return arises from the banks' holdings of mortgages.

In many instances, banks are burdened by high-cost branch networks, legacy technology, poor customer experience and regulatory complexity. This situation is potentially open to disruption by digital technology (Fintech) that may simplify the mortgage transaction chain and eliminate significant costs. In turn, these savings can be passed on to mortgagees and investors.

Pension funds are in an ideal position to partner with a provider that possesses the necessary finance and IT expertise. The pension fund could be a fixed-interest mortgage investor, an equity partner in the arrangement, or both. In addition, through the provision of financial planning advice,

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the pension fund can assist members to obtain lower mortgage rates, both as a service to members and a powerful engagement tool.

Nonetheless, there are potential disadvantages in this arrangement, such as default on mortgage repayments. It is essential that all risks are identified and mitigating strategies put in place.

Lower mortgage rates can assist retirement outcomes. On a 30-year-term \$300,000 mortgage, a saving of 50 basis points could translate to additional contributions to a pension fund amounting to \$80,000 at the end of the 30 years.

### **Practice**

Pension mortgage disintermediation is already applied in the Netherlands. An institution called MUNT Hypotheken originates mortgages through 1,700 mortgage brokers.

An associated entity, the Dutch Mortgage Fund – an independent investment manager in Dutch residential mortgages – invests in the mortgages on behalf of 11 pension funds. The program commenced writing mortgages in 2014 and has now originated EUR12billion residential mortgages (Institutional Asset Manager, 2018).

Banks used to provide all the mortgage finance in the Netherlands but now non-bank lenders comprise 20 percent of the market.

## **10. The Singapore experience – total integration**

The purpose of this section is to describe the experience of one country – Singapore – where there is total integration between housing and pension policies. The material in this section has mainly been sourced from Phang and Heble (2016).

There are three pillars of housing policy in Singapore: the HDB (the Housing Development Board), which was established in 1960; the Land Acquisition Act enacted in 1966; and the expansion of the CPF (Central Provident Fund) to become a housing finance institution in 1968.

The Land Acquisition Act gave the state broad powers to acquire land. State land, as a proportion of total land, grew from 44 percent in 1960 to 76 percent in 1985 and was about 90 percent in 2005. A significant proportion of the increase in state land can be attributed to land reclamation.

The acquired land is partially developed by the government and then sold to private developers on a leasehold basis. These leases are all long-term with the period for private residential development being 99 years. Net proceeds from land sales are channelled into government reserves – now estimated at 2.5 times GDP. Investment income from the reserves contributes to the government's annual operating revenue.

The HDB was set up to provide “decent homes equipped with modern amenities for all those who needed them”.



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In its initial years of operation, the HDB provided only rental units. It began offering housing units for sale on a 99-year leasehold basis from 1964 under its Home Ownership for the People scheme. Houses are made affordable through both price subsidies and grants, which can be highly targeted depending on the needs of the purchaser.

Price subsidies and housing grants are given to eligible households at the point of purchase. Government support for the HDB is in the form of (1) annual grants from the current budget to cover its deficits incurred for development, maintenance and upgrading of estates; (2) loans for mortgage lending and long-term development purposes; and (3) land allocation for HDB housing and comprehensive HDB town planning.

The effect of the HDB has been profound. The level of HDB housing stock increased from 120,138 in 1970 to 968,856 in 2015, a factor of eight times. Over the same period, the population increased from 2,075,000 to 5,535,000, a factor of 2.7 times. As a result, the residential home ownership rate increased from 29.4 percent in 1970 to 90.3 percent in 2015.

The progressive nature of housing purchase taxes and subsidies is illustrated from the following table (Phang and Heble 2016).

#### **Singapore housing purchase taxes and pensions**

<b>Residences/Incomes/ Housing Types</b>	<b>Additional Buyer Stamp Duty (+) Price Subsidy (-)</b>
	<b>%</b>
<b>Foreigners</b>	15
<b>SPR<sup>1</sup> investors</b>	10
<b>Singaporean investors</b>	7
<b>SPR home owners</b>	5
<b>Singaporean high-income home owners</b>	0
<b>Executive condominium</b>	-10
<b>HDB 5-room</b>	-12
<b>HDB 4-room</b>	-20
<b>HDB 3-room</b>	-35
<b>HDB 2-room</b>	-50

*Note: 1. SPR = Singapore permanent resident.*

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The HDB has also played a role in the Singaporean government's desire to avoid racial violence. One of the potential causes of such violence was the existence of single-race residential enclaves. Consequently, the HDB sets quotas for each race (Chinese, Malay, Indian/Other) for each neighbourhood block, thereby ensuring residential diversity.

Financing of housing in Singapore is greatly enhanced by the CPF. The CPF is a defined contribution fund (with annuitization options at retirement), where the employee contribution rate is 20 percent of wages and the employer contribution rate is 17 percent of wages, with wages capped at a ceiling of S\$6,000 per month.

Under the Public Housing Scheme, members of the CPF can use their CPF Account savings to buy an HDB flat (new or resale). Very generous limits (even exceeding the value of the property) apply as to the amount that may be withdrawn for housing purposes. Upon the sale of the HDB flat, the original withdrawal plus accrued interest must be repaid to the CPF.

The Private Properties Scheme enables members to use their CPF Account savings to buy or build private residential properties in Singapore for their own occupation or investment. Again, very generous limits apply as to the amount than can be utilized.

Singaporeans have embraced the opportunity to use the CPF for housing purposes. The purposes of withdrawals from the CPF in 2014 were:

- HDB housing 38.1%
- Private housing 15.0%
- Attain age 55 23.6%
- Medisave and medical insurance 11.9%
- Purchase of annuity 11.4%

That is, over 50 percent of withdrawals were in respect of housing.

With price subsidies and housing grants, the government has long been concerned about the potential for windfall profits from resale of HDB properties. Over the years, a number of policy initiatives have been launched (and some have been subsequently rescinded) to prevent excess profits. Measures that have been adopted at various times include:

- Ban on market transactions;
- Resale only available to citizens;
- Market resale not permitted for owners of any other residential property;
- Resale restricted to households of a minimum size; and
- Imposing an income ceiling.

Another general concern of the government that has arisen has been to avoid excessive price increases of residential property. Steps that have been taken over the years to overcome this concern have included:

- Varying the supply of HDB properties in a controlled manner;
- Imposing a capital gains tax;

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- Introducing a stamp duty; and
- Limitations on the ratio of loan to value.

As noted previously, many retirees have a significant proportion of their wealth in their home but are income-poor. In Singapore, reverse mortgages are generally not efficacious because of the leasehold nature of HDB properties.

To resolve the problem, the HDB introduced the Lease Buyback Scheme. In effect, the owner of a property that has a lease period to run of  $x$  years (for example, 65) could decide to sell the last  $y$  years (for example, 35) of the lease and retain the right to the property for  $x - y$  years (in this case 30). As a result, the home can be monetized.

### **Summary**

The level of compulsion that underlies Singapore's policies is such that they are unlikely to be suitable for many (any?) other countries. However, the results of interaction between pensions and housing (together with proactive government initiatives) are impressive. For example,

1. Pension savings have been mobilized for housing;
2. Housing assets can be monetized, as required;
3. Home ownership has been increased (29 percent in 1970 to 90 percent in 2015);
4. House price increases have been contained to reasonable levels;
5. Housing has been made available to lower socio-economic groups and housing policy has promoted racial harmony; and
6. The public-private partnership for the development of residential property has contributed positively and significantly to the economic and financial position of the country.

### **Europe**

There are few examples in this paper derived from Europe. There are several reasons for this:

1. In many European countries, households still predominantly rely on public pay-as-you-go pension schemes in which current contributions are used directly to finance current pension payments and hence no pension assets are built up. Thus there is less scope for interaction between pensions and housing.
2. Partly because of the first point above, households living in the Euro area on average have fewer assets compared to households in the U.S., the UK, Canada and Australia. In Europe the average level of assets (housing, other property, financial assets) is 5.5 times annual disposable income, compared to 6.5 to 8 times in the above-mentioned four countries (ING, 2016). Again, this provides less scope for interaction between pensions and housing.
3. The housing market is not homogeneous in Europe. One study (Wind et al., 2016) identified seven different housing models in Europe, depending on whether the country had a Western or communist background, whether rental rather than home ownership dominated, and whether home ownership was encouraged through government subsidies or the liberalization of finance conditions. This heterogeneity means that Europe cannot be considered as a single entity for the purpose of this paper.

Nevertheless, further research could be carried out on individual countries within Europe.

## **11. Conclusion**

Inevitably the financial environment will change and recently-observed trends will not continue indefinitely. However, it is highly likely that regardless of the future scenarios that unfold, an integrated approach to pensions and housing will continue to yield optimum results.

Actuaries have the skill sets to provide insights and innovative solutions in the complex interaction of pensions and housing, and it is hoped that this paper will encourage holistic thinking in this area.

Many current retirees have high home equity but at the same time are income-poor. A reverse mortgage on the family home can in some cases provide a valuable means of supplementing an inadequate post-retirement income. While reverse mortgages have not been popular in the past, there is a combination of factors that may lead to greater uptake: inadequate post-retirement income from other sources, high rates of home ownership among retirees and recent significant surges in property prices in many areas. There are, however, many barriers to the use of reverse mortgages, some of which are explored in this paper.

At the other end of the age spectrum, many young people are experiencing difficulty in raising a deposit to purchase a home, because of recent house price increases and low wage increases. If using pension funds can make the difference between a person being able to purchase a home rather than missing out, then the application of the balance in this way may improve the person's retirement outcome, compared to retaining the balance in the fund to accumulate to retirement. The advantages of gaining access to housing in this way must be balanced by the disadvantage of a reduced pension balance at retirement.

A third potential area of combining pensions and housing is in mortgage disintermediation. It is feasible for pension funds, together with a suitable partner, to take advantage of technology to provide less expensive mortgages for members, compared to the traditional channels.

An example of interaction between pensions and housing is the situation of Singapore. There, housing and pensions and proactive government involvement are totally integrated. The level of compulsion underlying the system may make replication impractical in other countries, but the end results are impressive: pension savings mobilized for housing, a high level of (and steady) home ownership, house prices constrained to a reasonable level, possible monetization of housing assets, and subsidies provided.

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