UNLOCKING HOUSING EQUITY THROUGH REVERSE MORTGAGES:

THE CASE OF ELDERLY HOMEOWNERS IN AUSTRALIA

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UNLOCKING HOUSING EQUITY THROUGH REVERSE MORTGAGES: THE CASE OF ELDERLY HOMEOWNERS IN AUSTRALIA[1]

Abstract:

This paper investigates the extent to which reverse mortgages can improve the economic well-being of elderly Australian homeowners. Reverse mortgages are designed to enable elderly homeowners to unlock illiquid wealth tied up in their housing equity to generate income. The elderly borrow against the value of their homes. However, no repayments are made until the house is sold or the elderly borrower dies. The findings from this paper indicate that the scope for reverse mortgages to improve economic well-being is considerable in Australia. Elderly homeowners who are likely to receive the largest gains from reverse mortgages are very elderly, single, female, and have significant housing equity. However, in areas with slow house price appreciation rates, elderly homeowners who enter into reverse mortgages face the risk of being left with little housing equity to draw on when needed or to bequeath to their beneficiaries when they pass away.

Keywords: Reverse mortgage; Elderly homeowners; Housing equity; Collateral risk

Word Count: 7,754 (excluding abstract and bibliography)

I. INTRODUCTION

The international literature on the economic circumstances of the elderly conventionally classifies the elderly as an income-poor but asset-rich group (Hancock, 1998b; Hurd, 1990; Rowlingson, 2006). In Australia, while the elderly are typically clustered at the bottom end of the income distribution, the majority are homeowners who have paid off all or most of their mortgage. For most elderly homeowners, housing equity represents their most significant asset. Although two-thirds (three-quarters) of elderly Australian couples (singles) rely on social security payments as their principal income source, 85 percent (74 percent) own their homes outright, that is, they have paid off their entire mortgage (Australian Bureau of Statistics, 2007). In a period of rapid population ageing that is driving up government expenditure on social security benefits and health care, fiscal sustainability and the balance of burden-sharing between generations have naturally come to the fore as issues of vital policy concern in industrialised countries. In this context, the housing wealth of elderly homeowners has emerged as a key asset that can be exploited to mitigate their low income levels through reverse mortgages. This has spawned the development of reverse mortgage markets in countries such the United States (US), United Kingdom (UK), Canada and Australia (Creighton, Jin, Piggott and Valdez, 2005).

Reverse mortgages are designed to enable elderly homeowners to unlock illiquid wealth tied up in their housing equity to generate income. The elderly borrow against the value of their homes. However, unlike a traditional forward mortgage, no repayments are made until the house is sold or the elderly borrower dies. The income generated from reverse mortgages clearly enables elderly homeowners on social security payments to become less reliant on government programmes to sustain their economic well-being.

The largest reverse mortgage market is currently in the US. Between 2001 and 2004, the number of reverse mortgages originated annually increased by over 500 percent to 40,000 in the US. Reverse mortgages in countries like the Australia, Canada and the UK are smaller in comparison (Creighton et al, 2005). However, signs of growth have been evident recently in the Australian market. Only three financial institutions were offering reverse mortgages at the start of 2005. By the end of 2006, this had increased to 18 (Wasiliev, 2006a). In 2005, the amount lent through reverse mortgages was $650 million (Munro, 2006). At the end of 2006, reverse mortgages were worth $1 billion in total and are forecasted to grow by at least $500 million annually (Wasiliev, 2006b).

Despite signs of growth in the market, there has been a dearth of quantitative research on the impacts of reverse mortgages on elderly Australian homeowners. Among the few existing Australian studies, Reed and Gibler (2003) and Thosar (2002) discuss the effectiveness of reverse mortgages in the context of population ageing. The possible impediments to reverse mortgage that Australian elderly homeowners face are discussed in Beal (2001). However, thus far studies have been descriptive in nature and have not ventured into the use of quantitative approaches to conduct analysis. This paper contributes to the existing knowledge base by adopting a quantitative approach to investigate the extent to which reverse mortgages can improve the economic well-being of elderly Australians and identify those groups who are most likely to benefit from entering into a reverse mortgage, as well as those who are unlikely to reap much benefit. The remainder of this paper is structured as follows. Section 2 presents an overview of the existing international literature on reverse mortgages. Section 3 outlines the modelling methodology. The empirical findings are presented in section 4. Section 5 concludes.

II. EXISTING LITERATURE

Existing reverse mortgage studies have produced somewhat mixed conclusions about the extent to which reverse mortgages can improve economic well-being. Using the Survey of Income and Programme Participation, Mayer and Simons (1994a; 1994b) find that one-third of elderly homeowners would increase their income by more than 20 percent with reverse mortgages in the US. While Mayer and Simons (1994a; 1994b) present somewhat favourable findings, Venti and Wise (1991) find that the median elderly homeowner only benefits from a small percentage increase in income from reverse mortgages despite using the same dataset as Mayer and Simons. Using the American Housing Survey, Merrill, Finkel and Kutty (1994) also present findings of modest impacts, identifying only 800,000 out of 12 million households as being the prime target group to benefit from reverse mortgages. In the UK, Hancock (1998a) finds that the potential gains in net income from reverse mortgages are small for elderly homeowners.

Studies that have examined the impacts of reverse mortgages on poverty alleviation have also arrived at conflicting findings. In the UK, Hancock (1998a; 1998b) finds that reverse mortgages has little potential to reduce poverty substantially among elderly homeowners. Hancock (1998a) finds that with reverse mortgage, the proportion of elderly homeowners with incomes below the household mean level would fall marginally from 67 to 64 percent after entering into a reverse mortgage. However, in the US, Kutty (1998) finds that 29 percent of all income-poor elderly homeowner households would be raised above the poverty line with reverse mortgages, and Mayer and Simons (1994a) finds that reverse mortgages would cause the poverty rate to drop from 16 percent to 4 percent among reverse mortgage eligible homeowner. When viewed in terms of the income-poor, these estimates indicate that three-quarters of the income-poor would be lifted out of poverty. The differences in findings between the UK and US can partly be attributable to the fact

that reverse mortgage income is subject to taxation and can reduce social security entitlements in the UK, but is tax-free and generally does not affect social security entitlements in the US (Council of Mortgage Lenders, 2007; HECM, 2005).

While findings on the extent to which reverse mortgages can improve economic well-being have been somewhat ambivalent, studies generally agree that the benefits of reverse mortgages are largely restricted to very elderly single homeowners (Hancock, 1998a; Kutty, 1998; Kutty, 1999; Venti and Wise, 1991). Merrill et al (1994a) note that it is those with significant housing equity who are most likely to benefit from reverse mortgages. Studies have also found that women are more likely to benefit than males (Hancock, 1998a; Kutty, 1998; Kutty, 1999). For example, Kutty (1998) finds that among elderly homeowners who can be lifted out of poverty by reverse mortgages, 69 percent are women.

This paper is the first Australian contribution to the international literature on the effects of reverse mortgage on elderly groups. The modelling methodology of this paper is detailed in the next section.

III. MODELLING METHODOLOGY

The Reverse Mortgage Model

A reverse mortgage model is simulated, based largely on the features of the US Home Equity Conversion Mortgage (HECM) programme. The HECM programme is the main programme in the US reverse mortgage market and has expanded rapidly over the last decade. The volume of HECM loans in 1990 was 157. By 1999, the volume was 50 times higher at 7,982 loans. Between 1999 and 2006, the volume of HECM loans increased ten-fold to 76,351 (Foote, 2007).

A HECM-type reverse mortgage has been chosen as the basis of this paper's analysis for two reasons. First, the features of a HECM-type reverse mortgage provide a useful template for analysis that will enable comparison with other existing reverse mortgage studies. For example, studies such as Case and Schnare (1994), Kutty (1998), Kutty (1999) and Morgan et al (1996) are also based on HECM-type reverse mortgages. Second, HECM-type reverse mortgages are typically multi-purpose government-backed programmes where the government protects homeowners (borrowers) from negative equity risk by ensuring that the borrower's liability will not exceed the value of the property at the end of the loan tenure. The elderly have been traditionally identified as risk-averse and financially conservative (Capozza and Megbolugbe, 1994). Hence, the backing of the government will likely assist the development of a reverse mortgages market among the elderly. Beal (2001) has noted that development of a reverse mortgage market among the elderly has not been smooth where the government has not facilitated its development, as in case of the UK.

Following Kutty (1998), Mayer and Simons (1994a), Merrill et al (1994) and Rodda, Herbert and Lam (2000), this study assumes a tenure plan in which monthly payments are made to the borrower in the form of an annuity. There is no algebraic formula for calculating payments for borrowers under the line-of-credit and hybrid plans, since borrowers can make drawings whenever they want to in the amount of their choice (Rodda et al, 2000). However, monthly payments under the tenure payment plan can be determined algebraically. A sinking fund formula derived from HUD's HECM handbook (1994) and Rodda et al (2000) is used to calculate the monthly payments elderly homeowners would receive if they enter into a reverse mortgage programme[2]:

$$A_i = L_i^0 \times \frac{r(1+r)^{m_i}}{(1+r)^{m_i+1} - (1+r)} \qquad (1)$$

where A_i = monthly payments to borrower *i*

L_i^0 = maximum loan advance to borrower *i*

r = monthly compounding rate

m = life expectancy in months

The monthly compounding rate, *r*, is one-twelfth of the sum of an expected average mortgage interest rate and a mortgage insurance premium. As with HECM-type reverse mortgages, the expected average interest is set as the sum of the June 2002 yield on ten-year Commonwealth treasury bonds of 5.86 percent and a lender's margin of 1 percent. The mortgage insurance premium is set at 0.5 percent. The mortgage insurance is designed to protect lenders from collateral risk, that is, the risk that the loan balance may exceed the value of the property by the end of the loan tenure. As lenders generally have to provide borrowers with a no-negative equity guarantee such that the borrower's liability will not exceed the value of the property, borrowers have to pay a mortgage insurance premium to the government so that the loan can be assigned to the government should the loan balance exceed the value of the property (Rodda et al, 2000)[3]. The interest rate *r* is 7.36 percent, or one-twelfth of the sum of the yield on ten-year Commonwealth treasury bonds, the lender's margin and the mortgage insurance premium. The expected remaining life expectancy is calculated as 100 years minus the age of the borrower at the beginning of the loan (Rodda et al, 2003)[4].

L_i^0, represents the maximum loan advance available to the borrower. It is a function of the level of housing equity, the borrower's age and the interest rate. The higher the housing equity level or the borrower's age, or the lower the interest rate, the higher the maximum loan advance. As older borrowers have shorter remaining life expectancies, the maximum loan advance is higher as

monthly payments are paid to the borrowers over a shorter period. L_i^0 is calculated net of debts owed against the home and fees incurred at the beginning of the loan tenure. At an interest rate of 7.36 percent, the maximum loan advance can range from approximately 45 to 75 percent of housing equity as age increases.

Consider, for example, the case of a typical single 85-year-old male homeowner who has $280,000 of housing equity. At an interest of 7.36 percent, the maximum loan advance available to him is 71.8 percent of his housing equity, or $201,040. The homeowner's expected remaining life expectancy is 15 years. Using equation (1), it can be estimated that monthly payments to the homeowner will amount to $1,836. The derivation of *r* and L_i^0 and the model parameter details are given in appendix A1.

The reverse mortgage model is operationalised using microdata from the 2002-03 Survey of Income and Housing (SIH), a comprehensive Australian survey rich in socio-demographic, income and housing variables. The sample is restricted to elderly homeowners aged 65 or over because the minimum Age Pension age for men is currently 65 years and the minimum Age Pension age for women is being increased by six months every two years till it reaches 65 years in July 2013 (Department of Family and Community Services, 2001). Thus, the age break of 65 years has direct relevance to policy-making. Owners of mobile dwellings such as caravans, tents and improvised homes are excluded. This provides a sample of 1,593 elderly homeowner income units[5]. Among these, 97 percent own their homes outright. Of the remaining 3 percent, the average amount of debt secured against the property is under one-tenth of the property value[6].

Under Australian laws, income from reverse mortgages generally does not affect tax liabilities and are not means-tested, that is, they do not reduce social security entitlements if they are paid as an income stream and are not used for investment purposes (Beal, 2001). This is similar to laws in the US, where income from reverse mortgages spent within the month is generally tax-free and non-means-tested (HECM, 2005).

Analytical Framework

The reverse mortgage model described above forms the basis of an integrated analysis which is designed to achieve the paper's aim of examining the impact of reverse mortgages on the economic well-being of the elderly and groups most likely to benefit from the programme. Potential economic gains from reverse mortgages are measured by computing net income and poverty rates before and after reverse mortgages. Net income measures are equivalised using equivalence scales from OECD equivalence scales that allocate 1 for the first adult, 0.7 for each additional adult and 0.5 for each dependent child[7]. The economic well-being measures are reported by housing equity level, age band, income unit type and region. The proportion of the income-poor who can be lifted out of poverty by entering into reverse mortgages is also calculated. All estimates are weighted by population weights to ensure that the survey estimates conform to benchmarks that are based on the numbers of persons and income units in the Australian elderly population.

Analysis is conducted to identify states and territories in which collateral risks may be undesirably high for homeowners. Collateral risk is defined as the risk that the loan balance may exceed the value of the property by the end of the loan tenure. If lenders have mortgage insurance, they are protected from collateral risk and this allows lenders to provide borrowers with a no-negative equity guarantee. However, a collateral risk analysis remains important for various reasons. First, elderly

homeowners residing in areas with slow property growth rates risk being left with insufficient housing equity to draw on in times of need. For example, consider the case of an elderly homeowner with a reverse mortgage who is unable to continue independent living in his/her own property. If the elderly homeowner's loan balance has exceeded the value of the property at the time of moving out of the property into an aged care facility, s/he will be unable to meet accommodation charges in the facility. This also poses a risk for the government who may have to intervene with additional income support during the elderly's remaining years (Berry and Dalton, 2007). Second, elderly homeowners in areas with slow property growth rates may have little housing equity to bequeath to their beneficiaries when they pass away. This may in turn result in increased housing affordability problems for future generations (Berry and Dalton, 2007). Third, due to the current lack of regulation in the Australian reverse mortgage market, best practice in the market is only guided by a voluntary industry code, in which a proven breach of a no-negative equity guarantee by lenders is not enforced by law. A lender could potentially exploit relatively trivial contract breaches to deny a borrower the no-negative equity guarantee, e.g. when a borrower fails to carry out regular maintenance or home valuations at his/her own cost (Munro, 2006).

Estimates from the real House Price Index (HPI) reveal that house price appreciation rates vary widely across states and territories[8]. While house prices have increased significantly in states like New South Wales, Queensland and Western Australia, the house price profile has been relatively flat over the last two decades in Tasmania and South Australia (Australian Bureau of Statistics, 2005). Homeowners living in areas with undesirably high collateral risk will potentially find it not worthwhile to enter into a reverse mortgage as they may be left with little housing equity to draw on in times of need or to bequeath to their beneficiaries. An exponential growth model is employed to predict the HPI borrowers are likely to face at the end of their tenure. The predicted exponential

growth rates are applied to the 2002-03 property values of reverse mortgages eligible homeowners to forecast property values at the end of the loan tenure. This forecasted value is compared with the forecasted outstanding loan balance at the end of the tenure to identify locations in which collateral risk would be undesirably high for homeowners. Details of the exponential growth curve can be found in appendix A2.

The findings from the base model are tested for sensitivity to changes in model and policy parameters. First, the interest rate is reduced and then increased by 0.5 percentage points to examine the sensitivity of the model findings to changes in interest rates. Second, the model assumes that elderly homeowners take out the maximum loan advance possible. If elderly homeowners were to convert only half or three-quarters of their maximum loan advance into income, how would this affect collateral risk? Finally, under present tax and social security arrangements, income from reverse mortgage loans that are paid as an income stream is not assessable for tax and social security purposes. It is plausible that the government would exploit the growth of the reverse mortgage market to create budgetary savings by making reverse mortgage income taxable and means-tested, as is the case in the UK. A policy simulation is conducted using the Australian Housing and Urban Research Institute tax-benefit microsimulaton model to examine how the economic well-being of homeowners with reverse mortgages would change if reverse mortgage income were made taxable and means-tested[9].

IV. FINDINGS

Estimates from table 1 indicate that the average elderly homeowner has a housing equity level of $288,130 and an income level of $16,719. With reverse mortgage, net income can increase by $11,928 or 71 percent. This increase is substantial, but as shown in the rest of the table, the gains

are not spread evenly across all elderly groups.

A strong housing equity effect dominates, as shown by the steep increase in gains as housing equity increases. While homeowners in the lowest decile gain 22 percent in income, those in the highest decile enjoy more than a doubling of their income level, the increase being 142 percent. A positive age effect is also evident. As the age of the borrower increases, expected remaining life expectancy falls, reducing the period over which the loan advance is annuitised. Hence, the gains are higher for those in older age groups.

Estimates by income unit type indicate that reverse mortgages could particularly benefit single elderly women. These findings have particular significance because women have longer life expectancies than men and are therefore more likely to need to incur significant health care costs during old age. Among those aged 80 or over in the sample, two-thirds are made up of single women, while only one-fifth are single men. Elderly women also tend to have lower incomes than men and are therefore tend to be more reliant on social security payments to sustain their economic well-being. Table 1 shows that the mean net income of single females is only three-quarters the income of single males. Moreover, 82 percent of single females rely on social security payments as their principal income source, as compared to 70 percent of single males. Couples are least likely to benefit from reverse mortgages even though they ten to have higher housing equity. This is because it is the age of the younger partner that is used to calculate monthly annuities. Elderly singles tend to be older than the younger partner among elderly couples. Thus, the loan advance has to be annuitised over longer periods for elderly couples than elderly singles. This age effect appears to outweigh the housing equity effect, that is, even though couples have a higher mean housing equity than singles, they do not appear to benefit as much from reverse mortgages as singles do because of

the longer period over which the loan is annuitised for couples. These findings are similar to findings from the US and UK, which conclude that reverse mortgages benefit very elderly single homeowners (Hancock, 1998a; Kutty, 1998; Kutty, 1999; Venti and Wise, 1991), those with significant housing equity (Merrill et al, 1994) and elderly women (Hancock, 1998a; Kutty, 1998; Kutty, 1999).

Regional differences are tied to differences in property values by region. Australia is divided into eight states or territories. These are listed in descending order by population size in table 1. New South Wales, Victoria, Queensland are Eastern states and have the largest populations. These are followed by Western and South Australia, Tasmania, Australian Capital Territory and Northern Territory. Elderly homeowners in states or territories with relatively high property values are most likely to gain from reverse mortgages. In New South Wales, where the mean housing equity is notably high at almost $400,000, the gain in net income from reverse mortgage is almost 100 percent. Only homeowners in South Australia and Tasmania, where mean housing equity is less than $200,000, experience less than 50 percent gain in net income from reverse mortgages.

TABLE 1 HERE

The focus now turns to examining the extent to which reverse mortgages can alleviate poverty among the elderly. Income-poor elderly homeowners are defined as those whose net incomes fall below the Henderson poverty line. The Henderson poverty line is one of the most widely used poverty lines in Australia. The lines are based on a benchmark income which is the net income required to support the basic needs of an income unit of two adults and two dependent children. Poverty lines for other income unit types are derived from the benchmark using a set of equivalence

scales and are updated every quarter to reflect current standards of living (Melbourne Institute of Applied Economic and Social Research, 2003). The Henderson poverty line estimates are detailed in appendix A3.

Table 2 indicates that reverse mortgage could substantial alleviate poverty among elderly homeowners by lifting 95 percent of the income-poor out of poverty. This is a departure from the findings of studies from the UK, which indicate that reverse mortgages have little potential to alleviate poverty (Hancock, 1998a; 1998b). A key reason contributing directly to this difference is that while reverse mortgage income is generally tax-free and does not affect social security entitlements in Australia, it is subject to taxation and is assessable for means-tested benefits in the UK (Council of Mortgage Lenders, 2007).

The findings from Australia are more similar to findings from the US, which indicate that reverse mortgage has the potential to lift a significant percentage of the income-poor out of poverty. In the US, Mayer and Simon (1994a) find that three-quarters of the income-poor will be lifted out of poverty, and Kutty (1998) finds the percentage that can be lifted out of poverty to be 29 percent. However, the gains from reverse mortgages reported in this paper still far exceed the gains reported in studies from the US despite similar tax and social security rules. One reason contributing to this difference is that the housing equity-to-gross income ratio is significantly higher in Australia than in the US. Disney, d'Ercole and Scherer (1998) reports that the level of wealth is almost 12 (15) times the income of singles (couples) aged 67 years or over in Australia; in the US, wealth is comparatively lower at 6 (7.5) times of income levels[10].

TABLE 2 HERE

The collateral risk findings suggest that homeowners residing in South Australia and Tasmania, where property prices have historically appreciated at low rates, face undesirably high collateral risk. It is estimated that collateral risk is extremely high in South Australia and Tasmania, where three-quarters of South Australian elderly homeowners, and almost all Tasmanian elderly homeowners, will find that their loan balances would have exceeded their property values by the end of the loan tenure. In all other states, collateral risk is negligible. It should be noted that the collateral risk estimates are based on the assumption that eligible homeowners choose to take out the maximum loan advance available to them, given their age and the prevailing interest rate. Hence, the collateral risk rates reported here are upper bound estimates. Collateral risk estimates will change if the interest rate changes or if homeowners were to convert only part of the maximum loan advance.

The sensitivity of the results to changes in the model parameters is tested by altering the interest rate, percentage of loan advance that is converted into income tax and social security treatment, and comparing the new estimates to the base model findings. The base model assumes that the interest rate is 7.36 percent, all eligible homeowners convert 100 percent of their loan advance into income, and income from reverse mortgage is tax exempt and non-means-tested. Each sensitivity analysis is conducted separately. For example, when the interest rate is altered, all other model parameters are held constant at base levels, that is, homeowners convert all of their loan advance into income and reverse mortgage income remains tax exempt and non-means-tested. When the tax and social security arrangements are altered, the interest rate is held at the base level of 7.36 percent, and so on.

The sensitivity results are presented in table 3. Net gains from reverse mortgage decrease when the interest rate is raised, and increase when the interest rate falls. As interest rate rises, the risk borne by the lender rises. This decreases the loan advance the lender is willing to give, which in turn decreases the amount that is annuitised. However, the table results suggest that the net income gains and poverty estimates are only affected slightly by small changes in interest rate.

Collateral risk in Tasmania remains unchanged following changes in the interest rate. This raises a potentially critical concern for Tasmanian elderly homeowners in that the house price appreciation rate is so low that even a 0.5 percentage point reduction in the interest rate fails to reduce collateral risk at all for homeowners in this state. The percentages of homeowners facing collateral risk in South Australia and Australian Capital Territory are highly sensitive to small changes in interest rates. A rise in interest rate of 0.5 percentage points increases collateral risk significantly in South Australia and Australian Capital Territory, whereas a fall in the interest rate of 0.5 percentage points has the effect of reducing collateral risk to zero.

The sensitivity of the South Australian and Australian Capital Territory results to interest rate changes is primarily due to the fact that in these locations, homeowners' forecasted loan values at the end of the loan tenure are extremely close to their forecasted property values at the end of the tenure. For example, among most homeowners in South Australia who are not facing collateral risk, forecasted loan values at the end of the tenure are at least 96 percent of forecasted property values at the end of the tenure. Hence, after an interest rate rise, most of these homeowners will find their forecasted loan values to be greater than their forecasted property values, hence placing them at collateral risk after the rate rise. Similarly, among all South Australian homeowners already facing collateral risk, forecasted loan values only exceed forecasted property values by less than 2 percent.

A slight reduction in interest rate of 0.5 percentage points will result in all of these homeowners' forecasted loan values being less than their forecasted property values, hence removing collateral risk previously in existence.

When homeowners choose to convert only three-quarters (half) their available maximum loan advance into income, the net gains fall from 71 percent to half (one-third). However, collateral risk is almost halved in Tasmania and completely eliminated in South Australia when homeowners convert 75 percent of their available loan advance into income. When only 50 percent is converted, collateral risk would be completely eliminated in all states and territories. Moreover, the percentage of income-poor lifted out of poverty remains at least 90 percent, despite only a half-conversion of the maximum loan advance. Making reverse mortgage income taxable and means-tested has the effect of lowering the percentage net gains from 71 percent to less than 50 percent. However, altering the tax and social security rules has no effect on collateral risk as it does not affect the amount of outstanding loan balance or the property value at the end of the loan tenure.

TABLE 3 HERE

V. CONCLUSION

This paper has examined the extent to which reverse mortgages can improve the economic well-being of elderly Australian homeowners. The findings indicate that the scope for reverse mortgages to improve economic well-being and alleviate poverty is considerable in Australia. Elderly homeowners can receive a net gain in income of 71 percent from reverse mortgages, and as many as 95 percent of income-poor elderly homeowners who are eligible for reverse mortgage can be lifted out of poverty. Elderly homeowners who are likely to receive the largest gains are very elderly,

single and female homeowners with significant housing equity. These gains are significant and are possible because elderly Australian homeowners have high levels of housing equity and income from reverse mortgage is non-taxable and non-means-tested in Australia. Policy simulation findings indicate that taxing and means-testing income from reverse mortgages would shrink the net reverse mortgage income gains of the elderly from 71 percent to 47 percent.

Homeowners who enter into a reverse mortgage in areas with slow house price appreciation rates like South Australia and Tasmania are likely to face high collateral risk. In Tasmania a potentially critical concern for homeowners is that the house price appreciation rate is so low that even a 0.5 percentage point reduction in the interest rate fails to reduce collateral risk at all for elderly homeowners in this state. Collateral risk can be reduced if the elderly were to convert only part, not all, of their maximum loan advance into income. If homeowners were to convert three-quarters of their loan advance into income instead of 100 percent, collateral risk would be almost halved in Tasmania and completely eliminated in all other states or territories. While a 75 percent conversion results in smaller net income gains, the percentage of income-poor lifted out of poverty would remain the same under a 75 percent and a 100 percent conversion. Aside from a part-conversion of housing equity into income, there are other similar products which could potentially reduce collateral risk for the elderly. For example, under a succession loan, the elderly borrow against the value of their homes, but their children pay the interest on the loan, leaving only the principal amounts to be repaid at the end of the tenure (Wasiliev, 2006a). Empirical analysis of a succession loan is outside the scope of this paper. However, succession loans are currently available in Australia and are clearly an alternative worth considering especially if the elderly wish to have remaining housing equity at the end of the loan to bequeath to their children.

Overall the paper has argued that given the concentration of wealth in the form of housing equity among elderly Australians and the current tax and social security arrangements in Australia, reverse mortgages can potentially be of great benefit to the ageing population. However, it is also clear that an elderly homeowner who enters into a reverse mortgage can potentially be exposed to great financial risks in the current highly unregulated Australian reverse mortgage market. In Australia, the lack of regulation in the reverse mortgage market means that best practice is only guided by a voluntary industry code developed by the Senior Australians Equity Release Association of Lenders, where a breach of the code is not enforced by law (Munro, 2006). The removal of the no-negative equity guarantee through trivial contract breaches can expose the elderly to undesirably high collateral risks, especially in states where house price appreciation rates have been historically low. Certainly the experiences of countries such as the UK would suggest that the development of the reverse mortgage market in Australia will not be smooth unless there is appropriate government involvement in the form of active regulation and government-backed reverse mortgage products.

APPENDIX A1: PARAMETERS OF THE REVERSE MORTGAGE MODEL

The model parameters are set as closely as possible to parameters in papers that analyse HECM-type reverse mortgages. For examples of studies that detail programme parameters for HECM-type reverse mortgages, refer to Case and Schnare (1994) and Rodda et al (2000).

The monthly interest rate is

$$r = (z \cdot p)/12$$

where

z = Expected average mortgage interest rate

p = Mortgage insurance premium

The expected mortgage average mortgage interest rate, *z*, is set at 6.86 percent, that is, the yield on ten-year Commonwealth treasury bonds of 5.86 percent plus lender's margin of 1 percent. The mortgage insurance premium, *p*, is set at 0.5 percent. Hence, *r* is 7.36 percent.

The maximum loan advance is

$$L_i^0 = F_i H_i - C_i$$

where

F_i = Unique loan advance factor that depends on the borrower's remaining life expectancy and interest rate

H_i = Housing equity

C_i = Itemised costs paid at the start of the reverse mortgage loan

The loan advance factor, F_i, is derived from the US's HECM Handbook (HUD, 1994) that depends on the borrower's age and interest rate *r* and applied to elderly homeowners in the 2002-03 SIH. In the handbook the factors are listed for interest rates ranging from 7 to 15.875 percent and the interest rates are listed in intervals of 0.125 percent. The interest rate that is closest to the required rate is chosen. In this analysis, the handbook interest rate that is closest to 7.36 percent is 7.375 percent. Because the 2002-03 SIH categorises the elderly into four age bands (65-69, 70-74, 75-79 and 80 or over), each person is assigned the weighted average age of his/her age band. The HECM loan factors by gender and age band are detailed in table A1. In the case of a couple, the age of the younger partner is used. The housing equity variable, H_i, is the sale price of the property less debt

secured against the property. Itemised costs, C_i, paid at the start of the reverse mortgage loan include fees incurred for application, loan origination, title deed search, home inspections, and an upfront mortgage insurance premium. Fees are set at 2 percent of housing equity and the upfront mortgage insurance premium is set at 2 percent of housing equity.

TABLE A1 HERE

APPENDIX A2: EXPONENTIAL PROPERTY GROWTH MODEL

An exponential growth model is employed to estimate the house price appreciate rate in each capital city and to project the HPI borrowers are likely to face at the end of their tenure using HPI data from June 1986 to June 2005. The predicted growth rates are used to forecast the property values of the elderly at the end of the loan tenure. This forecasted value is compared with the loan advance at the end of the tenure to distinguish between regions most likely to benefit from reverse mortgages and regions in which collateral risk would be undesirably high for homeowners.

The exponential property growth curve, expressed in log-linear form, is

$$\ln H_t = \ln H_0 + at \qquad (2)$$

Regression statistics are reported in Table A3. The coefficient *a* represents the quarterly nominal house price appreciation rate, so the annual house price appreciation rate can be approximated by quadrupling *a*. Historically, property prices have appreciated the fastest in New South Wales at 7.2 percent per year and in Victoria, Queensland and Northern Territory at 6.4 percent. The slowest property price appreciation has taken place in Tasmania and South Australia. House prices in New South Wales have grown at twice the rate of house prices in Tasmania.

TABLE A2 HERE

APPENDIX A3: POVERTY LINES

TABLE A3 HERE

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[2] A sinking fund is a fund into which the annuities are paid into and invested to sum up to a given amount by a particular date in the future (Merrett and Sykes, 1973). HUD (1994) and Rodda et al (2000) explains the calculation of payments under a tenure plan in detail.

[3] If the lender chooses to receive a portion of the mortgage insurance premium, the lender may not assign the loan to the government (Rodda et al, 2000).

[4] While females typically have longer life expectancies than males, the HECM payment calculator assumes that borrowers will live until 100 years old (HUD, 1994).

[5] An income unit is different from a household because an income unit comprises one or more persons whose command over income is shared (Australian Bureau of Statistics, 1997). Income sharing is assumed to take place among couples, and between parents and dependants. A household comprises people who typically reside together, and can contain more than one income unit. In Australia, the income unit is the standard unit for analyses of economic wellbeing. It is often the preferred approach in Australian housing studies (Dalton and Ong, 2007; Wood, Watson and Flatau, 2006).

[6] This group potentially comprises elderly homeowners who already have an existing reverse mortgage. However, it is not possible to observe from the data where this is the case.

[7] 0.2 percent of elderly income units in the sample have dependent children.

[8] HPI data are only available for capital cities (Australian Bureau of Statistics, 2005). Each state/territory is assigned the HPI of its capital city. Residents of Northern Territory and Australian Capital Territory are not classified separately in the 2002-03 SIH. Hence, respondents from these two territories are randomly assigned between the two territories according to population proportions.

[9] A microsimulation model simulates tax-benefit parameters for a sample of individuals. It is frequently employed to predict the impacts of policy changes by varying the tax-benefit parameters and simulating the impacts of the change. Examples include the Institute of Fiscal Studies' tax and benefit model from the UK (Giles & McCrae, 1995) and Canada's Social Policy Simulation Database and Model (Statistics Canada, 2006). See Wood et al (2006) for a description of the Australian Housing and Urban Research Institute microsimulation model.

[10] While wealth comprises both housing equity and financial assets, housing equity accounts for the dominant share of wealth among the elderly in both countries (Disney et al, 1998).

UNLOCKING HOUSING EQUITY THROUGH REVERSE MORTGAGES: THE CASE OF ELDERLY HOMEOWNERS IN AUSTRALIA

Table 1: Impacts of reverse mortgages on the net income of elderly homeowner income units, 2002-03

Characteristics	Housing equity (mean $)	Net income without reverse mortgage (mean $)	Gain in net income from reverse mortgage (mean $)	Gain in net income from reverse mortgage (%)	Population ('000s)
All	288,130	16,719	11,928	71.3	1,095
Housing equity decile[a]					
$1 – $95,000	69,908	13,438	2,947	21.9	116
$95,001 – $120,000	110,993	13,999	4,885	34.9	106
$120,001 – $150,000	140,054	14,758	5,727	38.8	125
$150,001 – $180,000	170,240	14,768	6,450	43.7	99
$180,001 – $210,000	198,186	14,657	9,077	61.9	107
$210,001 – $250,000	239,448	15,374	10,580	68.8	114
$250,001 – $300,000	285,546	15,763	11,701	74.2	135
$300,001 – $390,000	344,487	19,671	12,715	64.6	74
$390,001 – $550,000	454,021	19,607	18,826	96.0	113
$550,001 or over	924,187	26,844	38,155	142.1	105
Age band					
65-69 years	283,107	17,826	7,331	41.1	303
70-74 years	267,660	16,993	8,529	50.2	298
75-79 years	326,744	16,330	13,975	85.6	254
80 years or over	279,034	15,381	19,843	129.0	239
Income unit type					
Couple	295,454	16,795	7,687	45.8	499
Single male	289,318	20,342	14,878	73.1	164
Single female	279,224	15,253	15,701	102.9	432
State/territory					
New South Wales	393,189	17,322	17,117	98.8	373
Victoria	276,797	17,326	10,967	63.3	299
Queensland	211,938	14,937	8,163	54.6	188
Western Australia	224,857	16,687	8,935	53.5	96
South Australia	171,065	15,150	6,949	45.9	93
Tasmania	137,264	15,822	5,500	34.8	31
Australian Capital Territory	279,856	20,585	12,357	60.0	10
Northern Territory	334,202	31,996	12,582	39.3	4

Source: Author's calculations using the 2002-03 SIH

Note:

a. There are large numbers of elderly homeowner income units with housing equity levels of $150,000 and $300,000, being the upper threshold of the third and seventh decile, resulting in relatively large numbers of elderly homeowners in these deciles.

Table 2: Impacts of reverse mortgages on income-poor elderly homeowner income units, 2002-03

Characteristics	Poverty rate		Percentage of income-poor lifted out of poverty	Population of income-poor
	Without reverse mortgage (%)	With reverse mortgage (%)	(%)	
All	31.3	1.6	95.0	342,803
Housing equity decile[a]				
$1 – $95,000	35.5	4.4	87.5	41,302
$95,001 – $120,000	42.7	1.4	96.8	45,104
$120,001 – $150,000	29.7	2.1	93.0	37,036
$150,001 – $180,000	27.0	3.1	88.4	26,781
$180,001 – $210,000	37.7	1.0	97.4	40,270
$210,001 – $250,000	26.0	0.7	97.3	29,722
$250,001 – $300,000	35.7	0.8	97.7	48,245
$300,001 – $390,000	22.2	2.7	88.0	16,517
$390,001 – $550,000	30.1	0.0	100.0	34,098
$550,001 or over	22.6	0.0	100.0	23,728
Age band				
65-69 years	21.2	2.7	87.2	64,260
70-74 years	25.8	2.2	91.4	76,908
75-79 years	31.2	0.6	98.1	79,214
80 years or over	51.3	0.4	99.3	122,420
Income unit type				
Couple	5.4	2.0	63.0	26,714
Single male	41.7	1.4	96.6	68,477
Single female	57.3	1.2	98.0	247,612
State/territory				
New South Wales	35.6	1.6	95.5	133,019
Victoria	27.8	1.3	95.3	82,934
Queensland	35.0	2.8	92.0	65,807
Western Australia	23.1	1.5	93.5	27,411
South Australia	28.5	0.5	98.2	21,573
Tasmania	30.2	0.9	97.0	9,281
Australian Capital Territory	9.0	0.0	100.0	2,379
Northern Territory	24.6	0.0	100.0	400

Source: Author's calculations using the 2002-03 SIH

Note:

a. See note under table 1.

Table 3: Sensitivity of results to changes in model parameters, 2002-03

Key measures	Base model findings	Changes in model parameters				
		Change in interest rate (*r*)		Change in percentage of loan advance converted into income		Change in tax and social security treatment
		r+0.005	*r*-0.005	75%	50%	Reverse mortgage income taxed and means-tested
Gain in net income from reverse mortgage (mean $)	11,928	11,661	12,000	8,733	5,538	7,771.8
Gain in net income from reverse mortgage (%)	71.3	69.7	71.8	52.2	33.1	46.5
Income-poor lifted out of poverty (%)	95.0	95.0	95.0	94.3	90.5	95.0
Homeowners facing collateral risk[a]						
South Australia	74.4	99.0	0.0	0.0	0.0	74.4
Tasmania	99.2	99.2	99.2	54.5	0.0	99.2
Australian Capital Territory	0.0	44.7	0.0	0.0	0.0	0.0

Source: Author's calculations using the 2002-03 SIH

Note:

a. Only states and territories that are affected by the changes in model parameters are listed in the table. In all other states or territories, collateral risk remains zero.

Table A1: Loan advance factor, by gender and age band, 2003

Age band	Weighted average age (years)		Loan advance factor (r=7.36 percent)	
	Males	Females	Males	Females
65-69	67	67	0.479	0.479
70-74	72	72	0.541	0.541
75-79	77	77	0.608	0.608
80 or over	85	86	0.718	0.731

Source: Author's calculations using Australian Bureau of Statistics (2006) and HUD (1994)

Table A2: Exponential property growth model and house price appreciation rates

Capital city	Model equations	Adjusted R^2	Quarterly appreciation rate	Annual appreciation rate
Sydney	$\ln H_t = 4.412 + 0.018\ t$	0.909	1.8	7.2
Melbourne	$\ln H_t = 4.154 + 0.016\ t$	0.876	1.6	6.4
Brisbane	$\ln H_t = 4.289 + 0.016\ t$	0.842	1.6	6.4
Darwin	$\ln H_t = 4.513 + 0.015\ t$	0.921	1.6	6.4
Perth	$\ln H_t = 4.196 + 0.014\ t$	0.884	1.4	5.6
Canberra	$\ln H_t = 4.374 + 0.013\ t$	0.845	1.3	5.2
Adelaide	$\ln H_t = 4.350 + 0.012\ t$	0.786	1.2	4.8
Hobart	$\ln H_t = 4.445 + 0.009\ t$	0.881	0.9	3.6

Source: Author's calculations using Australian Bureau of Statistics (2005)

Table A3: Henderson poverty lines for Australia, September quarter 2002, dollars per year

Income unit type	Reference person in the labour force	Reference person not in the labour force
Couple only	20,457	17,565
Couple, one dependent child	24,590	21,698
Couple, two dependent children	28,723	25,831
Couple, three dependent children	32,857	29,964
Couple, four dependent children	36,990	34,097
Single only	15,292	12,400
Single, one dependent child	19,633	16,737
Single, two dependent children	23,763	20,870
Single, three dependent children	27,896	25,004
Single, four dependent children	32,029	29,137

Source: Melbourne Institute of Applied Economic and Social Research (2003)