

Housing with a silver lining

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Abstract

This paper analyzes the role of the house as a possible financing source for retirement. It analyzes the financial motivations for home ownership, and discusses how (over)exposure to housing market risk and to specific risk affect the wealth position of households. The analytical results based on the global minimum variance approach show that it is optimal to include a sizable part of the total wealth in real estate. Moreover the results show that the proportion of the house in the total portfolio should decline over time, thereby strengthening the case for home equity products. In addition we show that there is considerable idiosyncratic risk. The paper shows how retiring households could use the house as a financial engine to fund their retirement. The paper draws important lessons from international experience with targeted financial products. Especially the US experience with the Reverse Annuity Mortgage is promising and potentially very interesting for the Netherlands. We argue that there is a pivotal role for the government in enabling this market to come into being, by allowing banks or other financial institutions to get involved, and by adjusting the law in such way that a home equity product with an ideal architecture can be designed and launched.

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1. Introduction

The pension crisis is not yet upon us, but it soon will be. With increasing numbers of retirees and a shrinking working population, policy makers worry about the financial feasibility of the pension insurance system. Many countries are lowering the pension burden, by increasing the pension age or decreasing the pension, but it may be welfare-enhancing to explore alternative – and potentially more efficient – ways to finance retirement.

A hitherto largely untapped funding source for retirement is the house. Home ownership has been going up in many countries and for those households that own the house they live in, that house is often a dominant part of the household wealth portfolio. Given that dominance, the house is a logical place to study when thinking about retirement funding.

However, notwithstanding that promising point of departure, the house may have important disadvantages from the viewpoint of optimal retirement portfolio management. First, through the dominant position of housing in the average wealth portfolio, and because of the high leverage the mortgage market allows, home owners are easily too much exposed to housing market risk (Shiller, 1993). Second, the overwhelming majority of home owners own only one home, and are therefore exposed to unrewarded specific risk. Last, it is far more difficult to gradually consume the built-up housing wealth than the wealth that has been accumulated in financial assets, so retired households often live in their main store of wealth, without having the key to unlock it.

Homeowners' exposure to housing market risk is large for two reasons. First, the house is bulky, and second, it is financed through a lot of leverage. The numbers show that many home-owning households are overexposed to housing market risk, and the developments in the current housing market crisis illustrate the problem. Where country and regional housing markets fall, household wealth is very strongly affected. Especially when mortgage default is involved, households get locked into this wealth loss.

Second, most home owners also have a large exposure to specific risk, since they own just one home. And as with all specific risk, they are not rewarded for it. The recent housing market crisis illustrates how inefficient this is from a portfolio management point of view. In most countries, the housing market has distinctly regional characteristics. In the United States, for example, the deep crises in four large regions drive down the national average house price, while other regions are suffering far less severely. In Germany, the same holds. Average German house price have fallen in real terms for more than a decade, but this average hides big differences between regions like Hessen and Bavaria, where house prices have been rising, and regions like Sachsen and Berlin, where prices have been falling even in nominal terms in almost every year from the mid-1990s. If only home owners could diversify their specific risk across local housing markets.

Last, where liquid assets like stocks and bonds can gradually be sold over the lifetime after retirement to support income, the nature of the house precludes this. Home-owning households who want to realize some of the wealth that is locked into their house often do not have the financial instruments to do so. In most situations, only a sale of the house, followed by a move to the rental market or to a cheaper house or housing market, allows them to take out some of the home equity. Alternatively, they can take on an extra mortgage, but that may be suboptimal for a number of reasons.

Figure 1 shows the issue at hand, providing the division of mortgage debt and home equity to age groups.

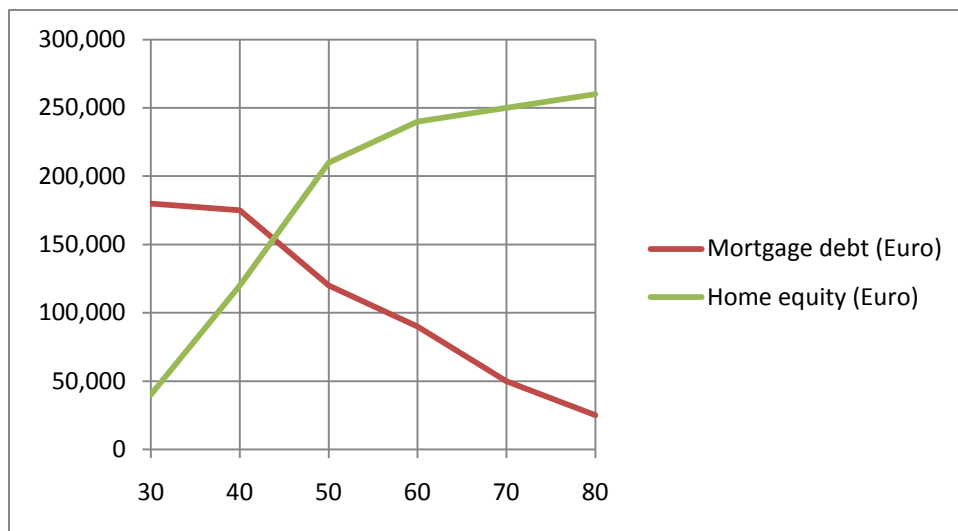


Figure 1 Age, mortgage debt and home equity. This is an interpretation of figure 11 of Jan Rouwendal, HOUSING WEALTH AND HOUSEHOLD PORTFOLIOS, De Economist (2009) 157:1-48

This paper addresses these three issues by analyzing the problems, and by proposing solutions. The remainder of the paper is structured as follows. In the first section, we will analyze and measure to which home owners are exposed – or over-exposed to market risk, either deriving from the dominant position of housing in the portfolio, or deriving from the high leverage due to mortgage financing. The second section discusses the issue of specific risk, and the third section looks at consumption of housing wealth. We end the paper with two sections providing a broader perspective: Section four discusses whether society really would be better off if the financial markets would get involved with these issues, and gives an outlook for the future. Section five provides a summary and some overall conclusions.

2. The house as part of retirement wealth

As stated in the introduction, one potential disadvantage of home-ownership and of considering the house as part of the wealth portfolio is that home-owners are easily over-exposed to real estate risk. We therefore want to find out what the optimal allocation to (residential) real estate would be for an investor, from a portfolio management point of view. In order to address that question, we analyze the composition and characteristics of the global minimum variance (GMV) portfolio with and without real estate included.

The GMV portfolio is the investment portfolio that only aims to minimize risk, without considering expected returns. In a standard mean-variance diagram it is the portfolio that is located at the extreme left of the frontier (See Figure 2). The advantages of focusing on this portfolio are two-fold. First, it allows us to highlight the effect of residential real estate on the risk of the wealth portfolio,

and therefore on the risk of retirement wealth. Second, by focusing on the GMV portfolio, we avoid the sensitivity of mean-variance portfolio weights on (estimated) mean returns, which induces the bigger part of estimation error in mean-variance portfolios. Our main conclusions also hold for other mean-variance portfolios though.

We start by analyzing a simple stock and bond portfolio and ask the question what the added effect for the risk and return of such a portfolio is if residential real estate is added to it. Table 1 first shows the characteristics of the global minimum variance portfolio of stocks and bonds only, based on monthly returns on US stocks and bonds for the period 1987-2007

If the investor would only invest in stocks and bonds, the optimal allocation would be to invest 88% in bond and 12% in stocks. This portfolio is optimal from a risk-minimization perspective, and has an expected return of 7.3% per year in nominal terms and a risk (standard deviation) of about 4.2% per year. Adjusting for inflation mainly affects the expected return and slightly increases the risk of the portfolio. Shifting the portfolio more towards stocks will obviously increase the risk while at the same time allowing the investor to capture part of the equity premium.

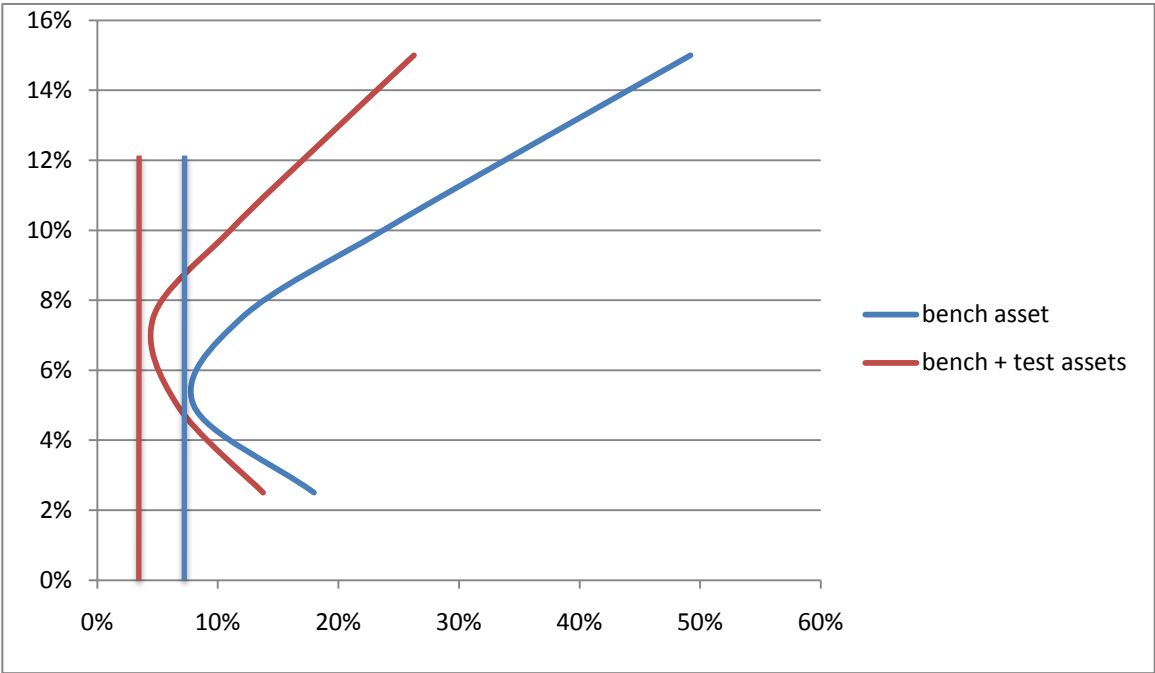


Figure 2: Mean-variance frontiers with and without real estate. The vertical lines indicate the Global Minimum Variance (GMV) portfolios.

The main question we want to address here is how the portfolio characteristics change when the investors’ house is considered to be part of his retirement portfolio, i.e., when at retirement he would sell his house and use the proceeds to buy an annuity for his retirement income. In the initial analysis, we assume that the house is a fully liquid asset, implying that the investor could adjust the fraction invested in stocks, bonds and the house every year - or even every month. We first analyze the GMV portfolio when consisting of stocks and bonds only, and subsequently extend the analysis to include the house as well. The second column of Table 1 shows the effects of the house in the GMV portfolio for this hypothetical case.

For residential real estate we use here the Case-Shiller composite index for 10 major city areas in the US. For stocks, we use the MSCI index, and for bonds the JPMorgan US Government bond index.

	Stocks/ Bonds	Stocks/ Bonds/ House	p- value
Mean return (nominal)	7,3%	6,7%	
Stdev (nominal)	4,2%	2,0%	5,3%
Mean return (real)	4,3%	3,6%	
Stdev (real)	4,5%	2,1%	7,2%
Bonds	88%	21%	
Stocks	12%	4%	
House		75%	

Table 1: properties of the GMV portfolio

The table shows the risk (standard deviation) an expected return (mean) of GMV portfolios without (first column) and with (second column) real estate included. The bottom part of the table shows the composition of the GMV portfolios. The last column shows the p-values for a test of the equalit of the risk of the GMV-portfolios. The results are for US stocks and bonds, and for the Case-Shiller indices for US residential real estate for 10 major US city-areas, for the period 1987 – 2007.

If the house is a fully liquid asset, the GMV would consist for 75% of residential real estate, whereas the remaining 25% is allocated roughly for 80/20 to bonds and stocks respectively. Including the house in the portfolio has a strong effect on the risk of the portfolio, which more than halves from 4.2% to 2.0%. The effect on the expected return is relatively small, falling from 7.3% to 6.7%. Thus, from a risk-minization point of view, it is certainly beneficial to consider the house as part of the wealth-portfolio since this becomes much less risky and the cost in terms of expected return foregone is relatively minor.

The last column in Table 1 shows that the risk reduction is also statistically meaningful. Using the spanning-type tests in Jobson & Korkie (1989) and De Roon & Nijman (2000), the ratio of the minimum variances without the house ($R_{1,t}$) and with the house included ($R_{2,t}$), has a Chi-squared distribution¹. Based on this, Table 1 reports the p -values of the risk reduction. In nominal terms, the reduction is significant at the 5% level. For real returns, the significance decreases, but there is still a reliable risk reduction at the 10%-level.

Thus, in this simplified setting, including the house in the wealth-portfolio has clear advantages for reducing the risk of the total portfolio. Obviously, there are at least three complicating factors when

¹ $T \left(\frac{\text{Var}[R_{1,t}^{GMV}]}{\text{Var}[R_{1,t}^{GMV}] - 1} \right) \sim \chi_1^2$

considering the house as part of the investment portfolio. First, the analysis in Table 1 is based on monthly investment horizons, whereas for retirement purposes, investors obviously have much longer horizons to consider. Second, the house is not a liquid asset, but one in which usually early in life a significant investment is made, which is then relatively fixed for the rest of the period. Thus, the investment in the house is bulky. Third, the house is usually financed with a mortgage, inducing a short position in a bond, which is not captured in the analysis above. We now proceed to address these three issues.

Focusing on the GMV portfolio as in Table 1, we first analyze the effect of an increasing investment horizon on the composition of the GMV portfolio. This is shown in Figure 3.

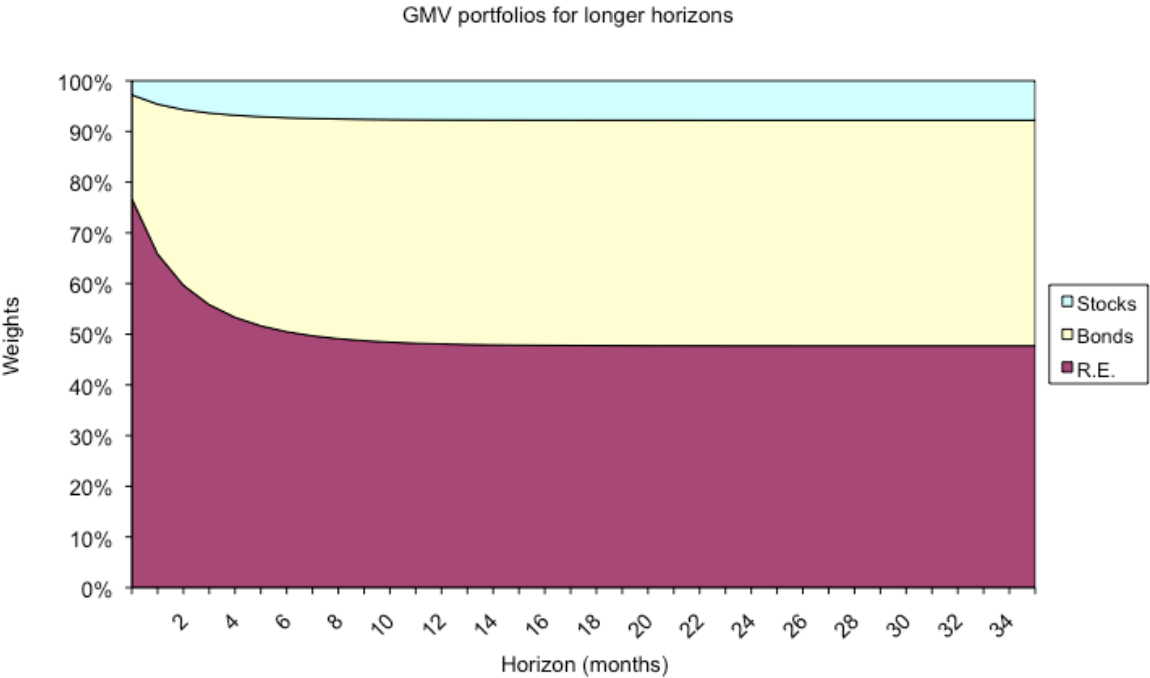


Figure 3: The Investment Horizon and the Global Minimum Variance Portfolio

This figure shows the percentage of stocks bonds and real estate in the long run. The share of residential real estate declines from 80% until approximately 50% in the long run.

Figure 3 shows that as the investment horizon increases, the optimal allocation in terms of the minimum variance (GMV) portfolio allocates more to stocks and bonds and less to real estate. For long holding periods, the optimal allocation is about 50% to the house, 40% to bonds and 10% to stocks, even though for the short-term the portfolio is biased much more strongly to real estate.

The relative composition of stocks and bonds is in line with most life-cycle models: for long investment horizons, i.e., early in life, there is a higher allocation to risky assets, which gradually decreases as we approach retirement, i.e., if the investment horizon decreases. Figure 3 also shows that optimally, the allocation to real estate would be lower early in life and should increase as we approach retirement – which is the opposite of what most investors encounter. This indicates that – especially early in life – home-owners are over-exposed to real estate risk, as optimally they would prefer to invest the better part of their (total) wealth in stocks and bonds.

Next, we consider the effect that the house is not a liquid asset and that it is usually financed by a mortgage. We consider a 20-year investment horizon, where initially the house is financed for 100% with a mortgage, which we model as a short position in a long-term bond. Thus, initially, the house and the mortgage form a zero-cost investment portfolio. The mortgage is then gradually repaid over the 20-year investment horizon. Next to the house, the investor has an initial amount of wealth that is invested in stocks and bonds. The three columns in Table 2 show three types of investors: a ‘wealthy’ investor, whose value of his house is 1/3 of the wealth invested in stocks and bonds, an investor whose house value equals the wealth invested in stocks and bonds, and a ‘normal’ investor whose wealth invested in stocks and bonds equals 1/3 of the value of his house.

For all three investors Table 2 shows stock/bond portfolios that initially consist of 25/75 stock/bond positions, or 50/50 stock/bond positions. Following life-cycle strategies these portfolio are gradually changed into a 100% bond portfolio at the end of the investment horizon.

	‘wealthy’		‘normal’
House/wealth ratio	1/3	1	3
	Mean return effects		
Stocks/bonds			
50/50	97%	96%	92%
25/75	98%	96%	93%
	Standard deviation effects		
Stocks/bonds			
50/50	86%	83%	94%
25/75	76%	71%	88%

Table 2: Risk/return Effects of Housing in the Portfolio

The table shows effect of including real estate in the stock/bond portfolio on the mean returns and standard deviations of terminal wealth for. The rows distinguish between two different stock/bond allocations. The columns distinguish between the ratio of the value of the house to the level of initial wealth invested in stocks and bonds.

For all three investors, and for both stock/bond allocations, Table 2 reports the change in expected return and risk resulting from the inclusion of the house financed by a mortgage. The benchmark case is an investor who has invested all his wealth in stocks and bonds and is renting a house, rather than owning it. The table then shows the effect on the expected return and risk of his wealth if he would own his house instead of renting it, implying that residential real estate becomes part of his wealth.

For instance, in case 1, the 'wealthy' investor, we see that the expected return on his total wealth decreases by 3% if he buys a house (financed with a mortgage) relative to the case where he would only hold a stock/bond portfolio.² Similarly, the risk (standard deviation) of his (terminal) wealth decreases by 14%. From Table 2 we see that the inclusion of a house as part of the retirement portfolio, decreases the expected return on total wealth somewhat, but always less than 10% (which means a reduction from e.g. 7% to 6.3%).

The risk reduction effect is much stronger. Except for a House/Wealth ratio of 1/3, the reduction in standard deviation always exceeds 10% and can be as high as 30%. Thus, whereas the effect on expected return appears to be relatively small, the effect on risk is much stronger. Consistent with the simple setting in Table 1, the long horizon results with life cycle portfolios in Table 2 show that the effect of including the house in the retirement portfolio is mainly in the reduction of (total) risk, whereas the 'price' in terms of expected returns foregone are relatively minor.

Importantly, looking across the different House/Wealth ratios in Table 2, the effect of including the house on total risk is not uniform, but U-shaped. The risk reduction increases when the House/Wealth ratio goes from 3 to 1, but decreases sharply again when we move from 1 to 1/3. Thus, there seems to be an 'optimal' level of the House/Wealth ratio, which in Table 2 is about 1.³ If the optimum would indeed be 1, this means that it would be optimal (from a portfolio point of view) to own a house whose value roughly equals the value of the investments in stocks and bonds.

Comparing the effects on risk and return for different starting portfolios of stocks and bonds, Table 2 shows that the effect from including the house in the total investment portfolio differs only in a minor way for the 50/50 versus 25/75 stock/bond portfolios. The difference is much more pronounced for the risk reduction again, where the reduction is about 10 percentage-points higher for the 25/75 starting portfolio. Thus, there also appears to be an interaction between the starting portfolio and the effect of the inclusion of the house, where the effect of real estate is much stronger for a portfolio that invests more in bonds.

In short, the above findings show that there are meaningful effects on the risk/return characteristics of total wealth, when we include the house in the total investment portfolio. The main effect is a reduction of the risk of the portfolio, whereas the 'price' in terms of a lower expected return is

² Technically we implicitly assume that the repayment of the mortgage equals the rent he would have to pay if he would not buy the house.

³ But obviously moving from 3 to 1 to 1/3 are big steps, so the optimum cannot be derived from this table.

relatively small. Including the house in the investment portfolio is more beneficial if the initial stock/bond portfolio is more tilted towards bonds. Across different House/Wealth ratios, the effect is U-shaped, suggesting that there is an optimal House/Wealth ratio. Finally the risk reduction effect holds in short horizon investment portfolios, but also for more realistic long horizon life-cycle portfolio settings.

The results above are based on the Case-Shiller-Weiss composite index for 10 different metropolitan areas in the United States. Obviously, this composite index in itself is a diversified real-estate portfolio that is different from owning a single house. Different cities are likely to have their own specific regional risks. In addition, owning a house is very different in one part of a city versus another, exposing home owners to idiosyncratic risk that is not reflected in the composite index. The next section attempts to address these issues.

3. Idiosyncratic risk in residential real estate

Although we do not have individual housing data, the Case-Shiller-Weiss indices are available for individual cities allowing us to address at least part of the idiosyncratic risk inherent in owning a house. Since part of the idiosyncratic risk derives from the fact that one lives in a specific city, with its own market dynamics, rather than in the ‘average’ city as reflected in the composite index, the city indices will show part of the idiosyncratic risk faced by households.

Table 3 shows the effects of including real estate in an investment portfolio based on the composite index as well as individual city indices. To illustrate the relevancy of studying cities, we first consider the city-specific idiosyncratic risk. Regressing the individual city residential real estate return on the composite return:

$$R_{City,t} = \alpha + \beta R_{Comp,t} + \varepsilon_t$$

We use the R^2 of the regression as a measure of idiosyncratic. If the R^2 is low, the city is ‘different’ from the average city in terms of price developments, indicating more city-specific risk.

	R2	W	p	s1/s0	m1/m0
Composite		880,6	0,000	46%	90%
Los Angeles	80%	366,2	0,000	63%	102%
Washington DC	78%	629,1	0,000	52%	94%
New York	68%	795,7	0,000	48%	79%
San Diego	66%	407,9	0,000	61%	101%
San Francisco	58%	358,5	0,000	63%	103%
Boston	54%	670,2	0,000	51%	75%
Miami	39%	809,2	0,000	48%	96%
Tampa	34%	783,3	0,000	48%	82%
Chicago	28%	892,3	0,000	46%	82%
Las Vegas	20%	398,8	0,000	61%	92%
Cleveland	12%	1453,4	0,000	37%	61%
Charlotte	9%	2114,2	0,000	32%	54%
Denver	4%	1209,2	0,000	40%	74%
Portland	1%	1019,0	0,000	43%	100%

Table 3: Specific Risk for Housing

This table provides information regarding the covariance of the house price index for an individual city with the Case-Shiller United States composite housing index. A high covariance implies low specific risk. The table also shows how the risk of the GMV portfolio is affected by including housing from a specific city into the portfolio.

Table 3 ranks the cities according to their specific risk with respect to the composite index. The remaining part of the table compares the global minimum variance (GMV) portfolio of only stocks and bonds with the GMV portfolio of stocks and bonds plus one of the city areas (or the composite) indices. The R^2 s range from 80% to 1%, yielding huge cross-sectional variation in idiosyncratic risk. Whereas cities like Los Angeles, Washington and New York share a big common component, cities like Denver and Portland show very high levels of city-specific risk.

The next two columns show results of a Wald test for the difference of the risk in the two GMV-portfolios (i.e., without and with residential real estate). For all city areas, the risk reduction is highly significant, as can be seen from the p-values. The next column shows the risk reduction in terms of the standard deviation, which shows that for most cities areas the risk reduction is about 50%. From both the Wald tests and the decrease in standard deviation we see that there is little relation with the idiosyncratic risk, except that the four cities with the lowest R^2 and thus the highest idiosyncratic risk actually show the highest levels of risk reduction. The last column shows the effect of including residential real estate in the GMV portfolio on the expected returns. Unlike the composite index, for some of the individual city areas, the effect on the expected returns can be quite sizable. Especially for the cities with high idiosyncratic risk, save Portland, the decrease in expected return is high.

In short, although a number of city areas show high levels of city-specific risk, this is not reflected in the diversification properties of house returns. All individual metropolitan areas show that the inclusion of real estate in the wealth portfolio leads to significant risk reduction, consistent with our earlier results. Idiosyncratic therefore does not seem to be important for the risk reduction benefits of residential real estate. However, the idiosyncratic risk does show up in that different city areas show big variations in the expected returns. Although outside the scope of this paper, this may be important in studying the (long term) risk/return effects of residential real estate in the optimal investment portfolio.

4. Using the house to finance retirement

Citizens reaching retirement age may or may not have a house. If they do, we already saw that this house often comprises a major part of their total wealth. But where financial assets can gradually be liquidated to provide additional income during their owners' remaining years, this is far more difficult for the house. In the Netherlands, as in most countries, there are no financial products allowing citizens to gradually consume the house. Under these circumstances, home owners can decide to sell their home and rent one instead. Alternatively, they may sell the home and move to a cheaper home, or to a cheaper housing market, thereby freeing up part of the equity in the original home. Lastly, they may decide to rent out part of their home, generating a regular income.

All these options have drawbacks. First, many retiring households probably like the house they live in – otherwise they wouldn't live there – so moving to another house may be suboptimal for them,

especially if that house is of lower quality. Second, moving to another segment of the housing market usually also involves a move to another social environment, likely to be unknown to that household. This may be good for some, but it will clearly be bad for other households. In a recent paper, Gobillon and Wolff (2010) show that retiring households tend to be quite mobile, but that they are more likely to move upwards in the housing market than downwards. Eichholtz and Lindenthal (2010) also show that older households tend to live in higher-quality houses, if one controls for things like age and income. In other words, comfort of living seems to be more important than freeing up home equity.

At first sight, moving to a good rental home would seem to be the best of both worlds: it would free up all the equity locked in the owned home, while it would leave the retiring household free in its decision to move up or down in terms of housing quality. Unfortunately, it also introduces a cash outflow in the form of the rent, and in many countries, the rental market covers a significantly lower quality segment of the housing market than the owner-occupied market. So moving to the rental market would conflict with the desire to move to homes with higher quality by older households found by Gobillon and Wolff (2010) and Eichholtz and Lindenthal (2010).

Renting out part of the home may be an option for some households, but this will not be possible for the majority of dwellings without fundamentally affecting the privacy of the household. So this will not be a broadly adopted way to consume home equity after retirement.

In many countries, the only other way to take out some home equity is by increasing the mortgage. In fact, in the years preceding the current housing market crisis, this had been what many households have done, but that approach has important disadvantages also. The first is a steady cash outflow in the form of additional interest payments. The other disadvantage is that it increases the systematic risk exposure of retired households, precisely when their flexibility to earn themselves out of a potential wealth loss due to a fall in house prices is no longer present. The recent housing market crisis has shown that this increase in systematic risk is not theoretical: the growth in second mortgages and the associated explosion in household leverage seems to have been one of the sources of financial instability that made the crisis happen. At the same time, home owners with high leverage tend to have suffered far more from the crisis than those who have financed their home more conservatively. Clearly, taking a mortgage to finance retirement is not optimal, neither for the retiring household, and nor for society as a whole.

Despite the fact that none of these methods of equity withdrawal is ideal, they have been widely used in the years preceding the recent housing crisis. For example, U.S. net equity withdrawal in all forms averaged approximately five percent of household disposable income in the ten years before 2006 (Klyuev and Mills, 2010). In Australia and the U.K. this was nearly ten percent in the same time period. Much of this equity has been withdrawn by households under 65, but econometric analysis by Schwartz et al (2010) for Australia shows that households whose head was in his/her 60s or 70s predominantly withdrew equity. This may have contributed to the build-up of financial instability that aggravated and possibly caused the crisis.

This is an obvious case of an incomplete financial market, limiting the life choices for retiring households. Fortunately, some countries have experience with financial products that do allow citizens to consume their house without the drawbacks of the methods discussed above. We can use the experiences with these products as natural experiments, and try to learn as much from them as we possibly can. Policy makers can use this information to define new products that meet the

demands of society. For example in the Netherlands it is currently being investigated to what extent pension funds can help their clients (re)finance their houses as to guarantee optimal pension loans.

The remainder of this section will focus on products in France and the U.S., where experience with these products is longest, and will continue with some lessons from other countries. We will discuss the French Viager, the U.S. Reverse Annuity Mortgage, the British Home Reversion Plan, and the Australian reverse mortgages.

4.1 The French Experience: The Viager

The Viager is a grassroots financial product with a long history in France. It is a well-known product with a firm basis in society: before the advent of the internet, the Saturday issues of many French newspapers contained classified ads offering and asking Viagers, and there are now websites devoted to this market. In effect it is a forward sale of one's home, in return for a life annuity or a lump sum. The seller remains in the house until death. Although French insurance companies are allowed to engage in the Viager market, this product is typically a contract between two private persons or households, and approximately one third of all Viager transactions occur between members of the same family (Vorms, 2009). So in order to engage in the contract, the two interested parties have to engage in person, with the awkward situation that one party obtains a direct financial interest in the death of the other.

Given the lumpiness of the contracts – they involve title on a whole house – most forward buyers would be involved in only one contract. That implies that the Viager is inefficient from a financial point of view: the housing returns, but also the risks borne by the original owner are transferred to another party, but that party is likely to have the same undiversified housing exposure, and the same portfolio dominance of the house. In other words, specific risk and market risk exposure are not reduced, but merely moved somewhere else.

Also, the Viager creates undiversified longevity risk exposure to the forward buyer, since transfer of the house only takes place at the death of the seller. Until then, the monthly payment on the life annuity continues. There have been many cases in which the forward seller outlived the – younger – buyer, whose heirs had to take over the monthly obligation.

4.2 The U.S. Experience: The Reverse Annuity Mortgage

The Reverse Annuity Mortgage is a product that has quickly grown in popularity in the U.S. over the last decade. Figure 4 provides information regarding the annual number of reverse annuity mortgages issued, starting in 1990. The graph clearly shows that this market has taken off from about 2001, after a slow start during the 1990s. During the recent U.S. housing crisis, growth of the market has stopped, and the number of new mortgages issued has stabilized at approximately 110,000 per year. This is a substantial number, but compared to the number of annually retiring households, it is still quite small.

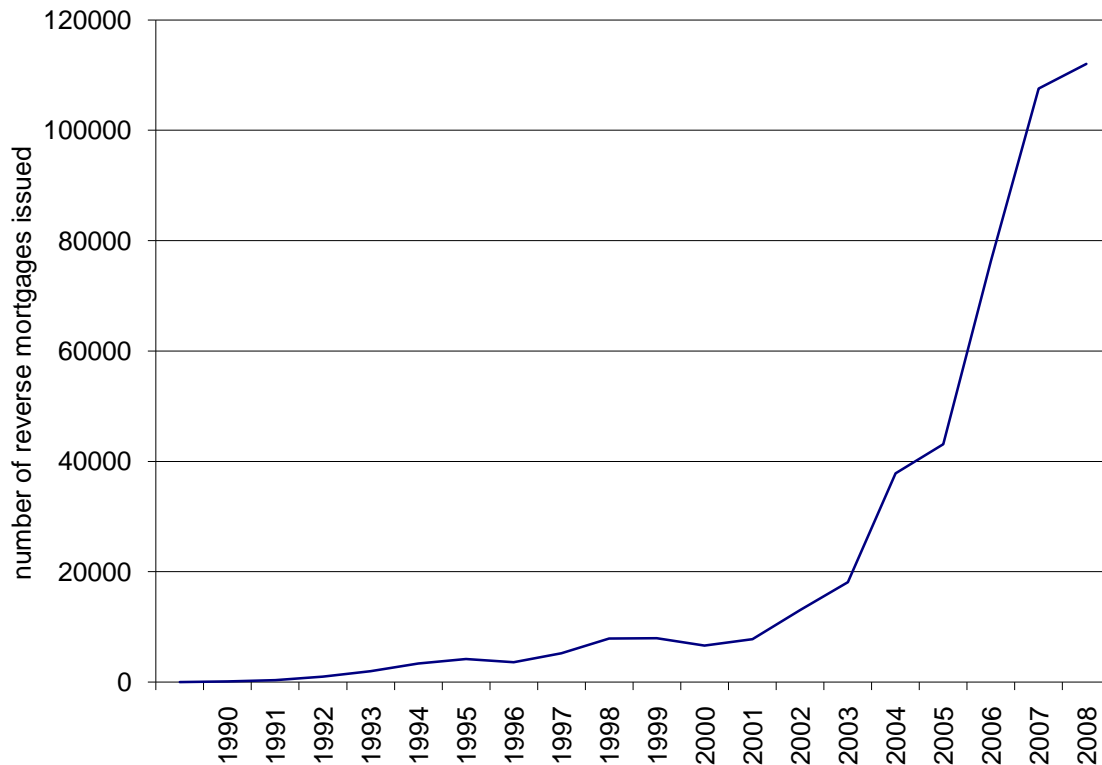


Figure 4: The U.S. Market for Reverse Annuity Mortgages⁴

As with the French Viager, the Reverse Annuity Mortgage loan typically pays out a fixed recurring – annually or monthly – amount of money, in return for the value of the house, to be paid to the mortgage issuer when the home owner dies, leaves the house or sells the house (in some cases the payment received by the seller is a lump sum instead of a regular payment). That implies that the home owner’s equity position in the house is gradually consumed. The level of the monthly payment varies with the home equity value, but also with the age of the owner(s). Older borrowers get higher payments.

During the life of the mortgage, the mortgagee keeps full ownership of the house, with all normal rights and obligations this entails. However, the lender can take possession of the house if the value of the house is jeopardized through actions of the owner. So if the owner doesn’t do proper maintenance, leading to disrepair, if the house is not properly insured, or if property taxes are not paid, thereby incurring a lien on the house, the lender has the right to repossession. Other than that, the home owner is assured to remain in the home until death, even if the property value would fall below the amount of the debt (Vorms, 2009).

The mortgage is non-recourse, so in case of default, the mortgage lender can take the house, but any other assets the households may own will not be at the disposal of the lender. In other words, the lender has taken over the housing market risk, which is especially relevant since the loan size is usually very close to the full equity that is locked into the house.

⁴ Source: <http://reverseannuitymortgage.org>

In order to qualify for the product, the home owner(s) should be at least 62 years old, and the home should be free of any mortgages or other liens. The monthly payments are not regarded as income, either by the tax authorities or by social insurance agencies, which implies that they are not taxed, and do not affect Medicare or social security benefits.

The Reverse Annuity Mortgage is issued by financial institutions and public bodies. The U.S. government is involved in this market, and offers the Home Equity Conversion Mortgage (HECM), which is federally insured. Many states and local governments also offer reverse mortgages. In terms of costs, the public-sector products tend to be most advantageous for the consumer, but they also tend to be associated with more rules and restrictions.

From a society point of view, the Reverse Annuity Mortgage is far superior to equity withdrawal through second mortgages, since this product does not introduce more credit risk or leverage, and does not affect the chance of personal bankruptcy. In other words, society's financial stability is not threatened by broad adoption of the Reverse Annuity Mortgage. The product's architecture also is more efficient from a financial perspective, as it shifts specific housing risk away from a single household to a much larger financial institution or to local or federal government. Due to their size, these institutions can and do diversify the specific risk away, thereby taking away a major inefficiency in the housing market. That also holds for the longevity risk associated with the product.

4.3 Home Equity Products in Other Countries

The U.K. Home Reversion Plan is similar to the Reverse Annuity Mortgage, but it is more restrictive. Under this scheme, a maximum of 50 percent of the value of the house can be sold. Between 2003 and 2007, the market has hardly grown, and annual new production amounted to approximately £ 1.2 bn. However, this involves more than only retired households. Of this market, only a small minority of issued products concerns Home Reversions (Williams, 2008).

In Australia, the market for Reverse Mortgages has been growing quickly, albeit from a small base. As December 2007, the total loan balance outstanding was just over two billion Australian dollars. In that year, these products were offered by 26 different intermediaries, all backed or owned by three of the four largest Australian Banks. The average consumer taking a Reverse Mortgage is 74, with 44 percent taken by couples, and 40 percent by single women (Berry and Dalton, 2010).

4.4 What Is the Outlook for These Products?

Despite the impressive growth of reverse mortgages in some of the markets in which they have been introduced, especially in the United States and Australia, the numbers involved remain small relative to the total number of (retired) households. Moreover, the presence and level of adoption of these products differ very strongly across countries. For policy makers and financial institutions planning to introduce home equity products, it is helpful to analyze the reasons for this low and diverse take-up.

It is likely that three issues play a role here. First, there may be cultural reasons for the non-existence of home equity take-out in many countries. Inheritance and other intergenerational transfers within

families, like dowries, are linked to very strong and old cultural habits and consuming the family's key asset instead of passing it – or its value – on to the next generation may be taboo. At the very least, the children of a retired household, who stand to inherit the house if it is not mortgaged, are unlikely to urge their parents to use a financial product enabling them to consume that same house.

Second, the Reverse Annuity Mortgage and its cousins are complicated financial products, involving things like the valuation of one's house, cash flows extending far into the future, and calculations based on actuarial survival probabilities. Even for financially educated citizens, such calculations are difficult to make, let alone for the average citizen, whose financial education is usually very weak. The OECD attributes the low take-up of the Reverse Annuity Mortgage – and of similar products outside of the U.S. – to the generally insufficient level of household financial education (OECD, 2005). This notion is confirmed by findings from an Australian survey reported in Wood and Nygaard (2010), who show that younger generations, whose average education level tends to be higher than that of older generations, plan to release housing equity after retirement in greater proportion than older households. Of course, the financial institutions offering these products do the calculations for the consumer, but lack of knowledge very often translates into lack of trust and therefore leads to inaction.

This brings us to the third reason why market adoption of home equity products has been so weak and diverse: government involvement. If lack of trust is a reason for the unpopularity of these products, the government, or another broadly trusted institution may get involved to help promote it. The experiences in the United States suggest that active government intervention can play a pivotal role in the success of these products. The reverse mortgage had existed already since the 1960s, but only took off after the U.S. government became actively involved in the early 1990s. The Department of Housing and Urban Development (HUD) initiated an FHA-guaranteed program called the Home Equity Conversion Mortgage in that year, which now dominates the market.

Before promoting these products, many governments first have to enable this market to come into being, by allowing banks or other financial institutions to get involved, and by adjusting the law in such a way that a home equity product with an ideal architecture can be designed and launched.

In short, the government may play a pivotal role in the establishment of home equity products. The question is whether it should take up that role. In other words, will our societies be better off if Reverse Annuity Mortgages and their equivalents are introduced?

Taking the viewpoint of society's risk, the answer is clearly yes. Reverse mortgages, when designed right, can help shift risks away from individual households and towards larger financial institutions that are far better positioned to manage these risks appropriately. A blossoming market in reverse mortgages can take away much of the specific risk that the citizens in our societies now run, thus improving their financial positions.

Likewise, in order to keep a financially viable pension system, home equity products are probably also a good idea. The generations that are about to retire will likely see lower pension benefits, even in countries that have adopted a partly funded pension scheme, like the Netherlands: substantial numbers of pension funds in that country are currently preparing plans aiming to cut back benefits in order to rebalance their liabilities with their assets. At the same time, it is likely that the ever increasing costs of our healthcare systems will translate into higher premiums for healthcare

insurance. In order to square the circle of lower benefits and higher expenses, alternative sources of income are required. The gradual release of housing wealth offered by reverse mortgages can play a vital role here.

But policy makers trying to include housing wealth in the means tests used for the eligibility of state-funded care and service benefits for the elderly have seen that this step can be a political minefield. For example, Australia's federal government has tried to take this route repeatedly – in 1984, 1997, and 2006 – and has each time failed after widespread controversy (Berry and Dalton, 2010).

5. Discussion and conclusions

In this paper we have analysed how people can use part of their home equity to finance old age and pensions. This paper analyzes the motivations for home ownership, and discusses how (over) exposure to housing market risk and specific risk affect the wealth position of households. The results based on the global minimum variance approach show that it is optimal to include a sizeable part of total wealth in residential real estate. Moreover, the results also show that the proportion of the house in the total portfolio should decline over time. We also show that there is considerable idiosyncratic risk in residential real estate, thereby strengthening the case for home equity markets.

We have also shown how retiring households could use the house as a financial engine with targeted financial products. We survey the various home-equity programmes in the United States, the United Kingdom, Australia and France. We think the development of the Reverse Annuity Mortgage Market in the United States provides an interesting role model and should be on the agenda in the Netherlands. Over the last decade this market has grown quickly. We think there are at least three reasons that hinder the widespread adoption or alternatively are important ingredients when considering introducing home equity: culture, financial illiteracy, and government involvement. The United States experience shows that government initiative in enabling this market can provide the necessary momentum. The United States experience with home-equity and reverse annuity mortgages deserves the immediate attention of Dutch policymakers.

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