

# WORKING PAPER

## *Executive Summary*

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## OPTIMAL RETIREMENT ASSET DECUMULATION STRATEGIES: THE IMPACT OF HOUSING WEALTH

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Housing constitutes the majority of the non-pension wealth of most households entering retirement. In addition to providing a place to live, the house is also a store of wealth that can be used to augment post-retirement consumption. But the homeowner cannot simply pocket the full amount as he will need to use a portion of the proceeds to either rent or buy another place to live. In short, a dollar of housing wealth buys less post-retirement consumption than a dollar of financial wealth.

While homeowners can access a portion of their equity by selling, most prefer to remain in their current home when they retire. One way for such households to access their housing wealth is to take a home equity loan or line of credit, but these require regular payments of interest (and sometimes principal). In contrast, a reverse mortgage enables households to consume some of their housing equity without the obligation to make periodic loan payments. With reverse mortgages, households borrow against the equity in the home, and the loan plus accumulated interest is repaid when the individual dies, moves out, or sells the house. Depending on how long the borrower stays in the house, the interest can compound over many years. As the amount repayable is capped at the sale proceeds, the maximum loan is always going to be less than the current value of the property.

This paper investigates alternative strategies for consuming housing wealth. The household can take the reverse mortgage as a lump sum, which it would then invest in financial assets, as a line of credit, to be drawn upon as needed, or as a lifetime income. The household can also either take the reverse mortgage immediately on retirement, or can delay until its financial wealth is exhausted. The decision as to when to take a reverse mortgage is a portfolio allocation decision. The optimal strategy will depend on the anticipated returns to housing and financial wealth, the riskiness of those returns, and the household's attitude towards risk.

The paper describes the design of reverse mortgages in considerable detail. It then analyzes data on stock, bond, and housing returns for the period 1975 to 2005. It shows that the total return on stocks, inclusive of reinvested income, has been much higher than the capital return on housing – 9.18 percent a year compared with 1.88 percent. Although the standard deviation of the movement in the OFHEO house price index is only 3.7 percent, previous research has shown that the standard deviation of the return to individual houses is much higher at 15 percent, close to the 15.5 percent standard deviation of stock returns over the above period.

But the above calculations understate both the mean and the standard deviation of the return to an investment in the reversionary interest. The value of the reversionary interest increases faster than the value of the house because the percentage of the value of the house that can be borrowed on a reverse mortgage increases with age. But the value of the reversionary interest also fluctuates with interest rates, so that a household aged 65 with a house worth \$200,000 could borrow as much as 57.1 percent of the value of the house in 2002 but only 5.7 percent in 1981, assuming reverse mortgages had been available at that time. We calculate that over the period 1975 to 2005 the mean and standard deviation of the return to an investment in the reversionary interest were 16.0 and 40.6 respectively at age 65.

We then evaluate alternate strategies for consuming the reversionary interest in the house, relative to a base case of taking a reverse mortgage at age 65 and adding the proceeds to the household's financial assets. The comprise postponing taking the lump sum until ages 70, 75, 80, or 85, or the age at which financial wealth is exhausted, if earlier, and taking either a lifetime income or a line of credit at either age 65 or when the household's financial wealth is exhausted. In each case, we assume that the household withdraws 7.2 percent a year of the current total of its financial wealth, reversionary interest, and undrawn balance on its reversionary interest. We calculate reverse mortgage equivalent wealth (RMEW), the factor by which the wealth of a household choosing the default strategy must be multiplied so that its expected utility equals that of the household choosing the alternative. When RMEW exceeds one, the household is better off with the alternative than with the base case.

We solve the problem using Monte-Carlo simulations, assuming a constant relative risk aversion utility function with coefficients of risk aversion varying from two to five. We experiment with alternative assumptions regarding the rate of withdrawal, the means of housing and stock returns, and the standard deviation of housing returns.

We find that there are sizeable differences in the returns to the various strategies and that the ordering is robust to alternative assumptions about the means and variances of asset returns. Taking a lifetime income invariably results in higher RMEW than the base case. Taking either a lump sum or a line of credit when financial wealth is exhausted – which is what the great majority of households do in practice – results in substantially lower RMEW than under the lifetime income strategy – as much as 24.6 percent less in the base case. Just as there is an "annuity puzzle," with households failing to take advantages of the benefits of annuitization of financial wealth, there is also a potential "reverse mortgage annuitization puzzle" as the reverse mortgage market expands.

We also find that the reversionary interest displaces bonds in the optimal portfolio so that households should optimally invest even more in stocks than suggested by models that focus purely on financial assets. The "equity premium puzzle" is even more of a puzzle than before.

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