

Editors' Introduction

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This special issue of the *Journal* is devoted to the housing finance problems of the elderly, the fastest growing segment of the population in the United States, Western Europe, and Japan. Reverse mortgages are instruments for unlocking the illiquid equity that elderly homeowners have accumulated. The articles in this issue examine the potential market for reverse mortgage products, identify the demand and supply factors inhibiting growth of the market and assess the associated risks. The research presented here offers insights into broadening market acceptance and improving the liquidity of the reverse mortgage market.

Housing finance for the elderly represents unique opportunities and concerns. These issues are often viewed in the context of the life-cycle hypothesis, which assumes the elderly will spend down accumulated assets during their retirement years. Since the bulk of the nonpension wealth of the elderly population is held in the form of illiquid housing assets, many elderly homeowners live off limited incomes, keeping the level of housing wealth intact. The bequest motive and a strong preference for remaining in the home are often cited to explain the cash-poor, house-rich status of a significant portion of elderly households. An incomplete reverse mortgage market may also be a factor on the supply side. The benefits of reverse mortgages are usually described in terms of increasing consumption among the elderly, and facilitating the liquidation of assets as predicted by the life-cycle hypothesis. However, the reverse mortgage might be better thought of as an asset management tool which, in addition to the obvious benefit of increased consumption, is capable of financing home improvements, at-home medical care, early bequests and assistance

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to offspring and their children without reducing the household's liquid assets.

The introduction of reverse mortgages has generated considerable attention among a traditionally risk-averse and financially conservative consumer group. The American Association of Retired Persons (AARP) has documented substantial interest among its members (Scholen, 1993). To gauge whether this interest translates into effective demand for reverse mortgage products, it is necessary to understand the housing preferences and financial decision making of elderly homeowners.

The Market for Reverse Mortgages

In the first article in this issue, VanderHart provides an empirical analysis of the housing decisions of older homeowners. Whether to remain in a home or move to alternative arrangements is a major life decision for most elderly homeowners. The decision is influenced by a complex set of financial and demographic factors such as income, wealth, home equity, housing costs, marital status, health and the presence of children. VanderHart investigates the relative importance of financial and demographic factors in explaining the housing decisions of the elderly. Using data from the Panel Study of Income Dynamics, VanderHart's results indicate that demographic factors generally dominate financial factors with regard to the housing decisions of the elderly. While instruments such as reverse mortgages may financially benefit older homeowners, they may still play only a limited role in enabling the elderly to stay in their homes.

Despite demographic shifts that are favorable to the developing reverse mortgage market, the existing literature has found a limited potential market for reverse mortgages. Venti and Wise (1991), for example, conclude that the effective demand for reverse mortgage products is restricted to very elderly single homeowners. This special issue of the *Journal*, however, identifies a much larger pool of potential beneficiaries. Using data from the Survey of Income and Program Participation, Mayer and Simons identify elderly households with high levels of housing equity who might significantly increase their income and liquid wealth through reverse mortgages. In addition, the authors consider both the needs of elderly homeowners with high debt obligations who might use a reverse mortgage to ease their debt burdens and childless elderly homeowners for whom the bequest motive is assumed to be absent. In contrast to previous stud-

ies, the results suggest a large potential market for reverse mortgages. Mayer and Simons estimate that 6.0 million U.S. households could increase their monthly income by at least 20% with a reverse mortgage; 1.3 million of these elderly households are childless. Furthermore, the authors estimate that reverse mortgages would allow more than 1.4 million poor elderly to raise their income level above the poverty line.

Merrill, Finkel and Kutty likewise estimate the potential size of the market for reverse mortgages but rely on Annual Housing Survey (AHS) data. The 1989 national AHS shows that more than 12 million elderly homeowners aged 62 and over own their homes free and clear. Nonetheless, depending on income, age and level of home equity, the number of households most likely to benefit from a reverse annuity mortgage is considerably smaller. As one approach to defining a lower bound on the estimate of potential beneficiaries, Merrill, Finkel and Kutty count the number of homeowners in a prime group consisting of those aged 70 and above, whose annual income is \$30,000 or less, whose home equity ranges between \$100,000 and \$200,000 and who have resided in their homes for more than ten years. They estimate that about 800,000 elderly households fall into this group. For such households, a reverse mortgage could produce a substantial percentage increase in income.

The authors also use the 1985 through 1988 metropolitan area AHS data to identify areas characterized by large numbers of elderly households in the prime target group which, in turn, represents a significant fraction of the elderly homeowner population in a given area. Merrill, Finkel and Kutty view these locations as likely targets for introducing reverse mortgage products. They identify eight to twelve specific metropolitan areas in the Northeast and California that have large numbers and high concentrations of elderly households with low income and relatively high equity.

The Home Equity Conversion Mortgage Program

Although these studies point to a greater potential market for reverse mortgages than previously suggested in the literature, significant obstacles remain with respect to consumer and lender acceptance of reverse mortgage products. As the only national reverse mortgage program, the Home Equity Conversion Mortgage (HECM) Insurance Demonstration of the U.S. Department of Housing and Urban Development (HUD) provides unique insights into the demand and supply facets of the reverse mortgage market. The program provides mortgage insurance for reverse mortgages originated by FHA-approved lenders. Specifically, it compen-

sates lenders in the event that the sales proceeds are insufficient to meet the outstanding mortgage balance. It also guarantees borrowers that loan payments will continue should the lender default.

In their evaluation of the HECM Insurance Demonstration, Case and Schnare analyze demand issues by examining borrower characteristics and preferred loan terms. They also consider supply constraints by investigating the origination process and identifying a variety of legal and regulatory barriers. For lenders, a lack of familiarity with reverse mortgages has meant the costly and time-consuming development of staff capabilities, documents and loan processing procedures. Even though these procedures are burdensome, underwriting requirements are minimal, given that the loan is secured solely by the property. A reverse FHA loan origination takes an average of two weeks longer than a forward FHA mortgage origination. The flexible payment plan available under the HECM program creates unpredictable payment streams, making servicing functions difficult to standardize. In addition, the line-of-credit options require lenders to comply with additional disclosure regulations mandated by the Truth-in-Lending Act. Finally, borrowers must undergo counseling before participating in the HECM program.

By reducing the unique risks associated with reverse mortgages, the insurance provision in the HECM program is critical to overcoming the reluctance of private lenders to originate and service reverse mortgages. Szymanoski presents the model developed by HUD to assess and manage reverse mortgage insurance risks. The risk analysis framework involves a three-step design process: (1) determine the level of risk protection that provides sufficient comfort to both borrowers and lenders; (2) fix a uniform premium structure for the mortgage insurance that provides the protection; and (3) control the insurance risk on each mortgage by setting limits on the cash advances that lenders can make to borrowers. Mortgage insurance is needed because lenders may not be repaid all of the principal advanced and interest accrued when the loan becomes due and payable. Borrower longevity, interest rates, and future property values are the primary sources of risk for the reverse mortgage lender. By providing a guarantee against collateral losses, an insurer of HECM reverse mortgages assumes most of these risks. The mortgage insurance covers any shortfall in the lender's recovery from the property sale.

HECM uses a pricing model to limit cash advances by employing a principal limit factor that is uniquely determined for each loan. The principal limit factor is the highest initial loan-to-value ratio for which the insurance premium will cover expected losses from future claims. A unique principal limit factor corresponds to each combination of borrower age

at closing and interest rate. The risk analysis framework provides a method for limiting principal advances to borrowers to control risk, but it requires the insurer to make several assumptions, including estimating parameters for the mean and standard deviation of property appreciation and the loan termination probabilities.

Reverse Mortgages: Contracting and Risk

Even though both publicly guaranteed and privately default-insured reverse mortgages are available to borrowers, reverse mortgage markets remain incomplete. The markets for resale, securitization and derivative instruments, widely available for forward mortgages, have not materialized for reverse mortgages. Part of the problem lies in market share and size, as well as in the inability of providers to take advantage of scale economies and diversification. Specific pricing issues regarding reverse mortgages must be resolved before these contracts can be securitized.

Chinloy and Megbolugbe develop a pricing model for a reverse mortgage by deriving the model's option structure and characteristics. The structure represents an initial step in developing resale and derivative markets for reverse mortgages. Once the options embedded within the contract are priced, they can be repackaged and sold as securities. Chinloy and Megbolugbe's model permits cost-of-living protection by either indexing the payment to the borrower or adjusting the house collateral. The authors estimate the value of the crossover option when the accumulating loan balance exceeds the value of the house. Unlike the conventional default put on a forward mortgage where the borrower hands over the keys, after crossover, a reverse mortgage borrower continues to receive payments with no equity. The crossover option is priced for alternative reverse mortgages under different specifications of house price increases and tenure. With the crossover risk priced, derivative securities, swaps and hedges could be constructed to increase the liquidity of reverse mortgages.

While the relatively slow growth in the market for reverse mortgages is often attributed to borrower and lender lack of familiarity with the instrument, nonstandardized contracts and the absence of insurance, Boehm and Ehrhardt point to another barrier to widespread market growth: reverse mortgages have exceptionally high interest rate risk, which may be detrimental to the hedging attempts of many financial institutions. Boehm and Ehrhardt develop and apply a valuation model that quantifies the interest rate risk of a reverse mortgage. Their empirical results reveal that, in many cases, the reverse mortgage has an interest rate risk several or-

ders of magnitude greater than traditional instruments. Unless financial institutions correctly measure the risk inherent in reverse mortgages and hedge it appropriately, they are likely to experience unexpected price volatility. Investors and regulators should also be aware of this risk, according to Boehm and Ehrhardt, because reverse mortgages may represent substantial off-balance-sheet liabilities. In fact, the market has already responded to the interest rate risk posed by fixed-rate reverse mortgage products. The instruments currently being offered are predominantly adjustable-rate mortgages, so that lenders bear much less actual interest rate risk than is indicated by the model.

Interest rates also contribute to prepayment risk. In their assessment of the Connecticut Housing Finance Authority (CHFA) Reverse Annuity Mortgage program, Klein and Sirmans analyze several factors influencing loan prepayments. The CHFA program issued 765 reverse mortgages over a five-year period, nearly one-third of which have terminated payments. Data on the terminated loans reveal prepayment rates that vary across borrower and loan characteristics. The rates are most sensitive to marital status and are heavily affected by the age of the borrower and the term of the loan. Although default risk exists, the evidence presented by Klein and Sirmans indicates a low probability of loan values exceeding house values.

Finally, Miceli and Sirmans examine the risk that borrowers will undermaintain their houses as they transfer future equity to current consumption through reverse mortgages. Undermaintenance by the borrower can reduce the value of the house during the term of the loan, and thus contribute to collateral risk. Most reverse mortgage contracts have a limited liability feature, such that the lender simply receives the sales price of the house in lieu of the outstanding loan balance. A borrower who anticipates this outcome will have less incentive to maintain the house than the borrower who expects to receive all, or at least some, of the accumulated equity upon sale of the house.

To identify the nature of the maintenance risk associated with reverse mortgages, Miceli and Sirmans model the maintenance decision of reverse mortgage borrowers. They show that, in general, the risk of undermaintenance depends on the amount of the loan and the expected state of the housing market. They also examine the optimal behavior of lenders in the presence of both market and maintenance risk. When the reverse mortgage market is competitive, lenders limit loan amounts so that neither risk threatens to reduce the value of the house below the loan balance. The authors demonstrate that maintenance risk is important to lenders

only when it poses a greater threat than market risk. This problem may be overcome by limiting the amount of the loan to ensure that the borrower expects to retain some of the equity at the time the loan matures.

Despite accelerated interest in reverse mortgages, borrower and lender acceptance remains below expectations. The articles in this issue of the *Journal* reduce some of the uncertainty surrounding reverse mortgage instruments. Reverse mortgages featuring flexible line-of-credit options are clearly the product of choice among borrowers. As the market develops, lenders should face fewer processing and servicing difficulties. By providing mortgage insurance and limiting loan amounts so that borrowers retain an equity interest in the home, most risks associated with reverse mortgages can be effectively reduced. Mortgage markets have concentrated on developing debt markets to allow younger households to buy or refinance homes; reverse mortgages represent an evolution of the mortgage market that will permit older households to sell locked-in house equity. While significant legal, regulatory and marketing hurdles remain, reverse mortgages are a viable financial instrument for meeting the special housing finance needs of the elderly.

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