Retire on the House

The Possible Use of Reverse Mortgages
to Enhance Retirement Security

Mark J. Warshawsky

MERCATUS WORKING PAPER

MERCATUS CENTER
George Mason University

Abstract

This paper focuses on the use of reverse mortgages or home equity conversion mortgages (HECMs) to enhance retirement security. If present trends continue, many American households working today will face a significant retirement funding gap, and this study asks whether reverse mortgages can be used to fill at least some of this estimated gap. This study provides a detailed description of the features and history of reverse mortgages; reviews the existing literature on the motivations people have to use their houses to pay for retirement expenses, especially for long-term services and supports; and, in original empirical simulations, finds that only 12–14 percent of all retired households are suitable for, and might sensibly use, home equity conversion mortgages. The paper concludes with some public policy ideas that would lower costs and increase demand for reverse mortgages, as well as encouraging their use in the United States to improve retirement security.

Author Affiliation and Contact Information

Mark J. Warshawsky
Senior Research Fellow, Mercatus Center at George Mason University
mwarshawsky@mercatus.gmu.edu

Author's Note

This paper is based on a longer, similarly titled monograph by Mark J. Warshawsky and Tatevik Zohrabyan. That monograph, published in July 2016, was supported by the MIT Golub Center for Finance and Policy and was posted on that institution's website. Sections are included in that monograph (but not in this paper) on market and policy developments for reverse mortgages in several other countries, and on details pertaining to the datasets used and to data and sample adjustments used in the empirical analysis here. Also, see a section in that monograph and in the paper by Warshawsky (2017) on a current comparison of market terms on immediate annuities and the payout from the HECM tenure product.

Retire on the House:

The Possible Use of Reverse Mortgages to Enhance Retirement Security

Mark J. Warshawsky

Introduction

The near-consensus in the professional literature is that, on the basis of present trends, behaviors, conditions, and policies, many—perhaps most—American households working today will face a significant retirement funding gap.[1] Some have even gone so far as to term this finding a retirement crisis. Many solutions featuring new programs and products have been offered to reduce the estimated funding gap—that is, to improve the retirement security of working households and even current retirees. This paper, however, focuses on one solution that uses a current financial tool with assets currently available to most retirees: the reverse mortgage, also known as the home equity conversion mortgage (HECM), on owner-occupied primary housing.

Perhaps the most comprehensive and careful recent article demonstrating the retirement funding gap is by Gaobo Pang and Mark Warshawsky (2014). As is the case with the creators of other models in this literature, Pang and Warshawsky compare the actual wealth of households with model-indicated target levels. However, Pang and Warshawsky's measures of wealth and especially model-indicated targets are more comprehensive and precise than those of other researchers. Pang and Warshawsky use data from the Federal Reserve's 2007 and 2010 surveys of consumer finances and calculate the proportion of the population that is saving inadequately. Their model is based on the life-cycle theory—namely, that households have the goal of maintaining a similar living standard before and after retirement. The model calculates, for every household, the optimal income replacement rate in retirement and simultaneously the necessary

---

[1] A few analysts disagree, and Warshawsky (2015) fully explains their views, but the most careful research in this area is indeed consistent with a significant retirement funding gap.

savings rate in working years. The model uses workers' estimated earnings profiles, work- or age-related expenses, tax schedules, retirement account benefits, and plan provisions, including Social Security and 401(k) and employer-provided defined benefit pension plans.

Pang and Warshawsky's definition of household wealth is similar to that of other studies, and it excludes housing equity, implicitly assuming that housing equity is devoted to the payment of long-term-care services and supports later in life. (Long-term-care spending and planning is not usually explicitly included in these types of models, but, as discussed later in this paper, contingent planning for long-term care is an empirically founded and reasonable behavior of retired households.) Pang and Warshawsky's result for 2010 is that 44 percent of working households age 40 and older have a retirement funding gap of 10 percent or more, which means they are not saving adequately if they are planning to retire at the normal Social Security retirement age. Fifty-one percent of households are inadequately prepared if one takes seriously their desired retirement age (as indicated by survey), which is typically younger than the Social Security normal retirement age. Workers in their forties are proportionately less prepared; married workers are better prepared. Households with defined benefit pension coverage are much better prepared, reflecting the sometimes quite generous terms of those plans, especially in the government sector (although the funding adequacy and hence security of those benefits are naively assumed to be secure).

As noted, Pang and Warshawsky did not include housing equity in their calculation of spendable assets during retirement. But what if the long-term care issue were solved some other way (perhaps through insurance) and housing equity were instead used to support consumption in retirement—would this lessen the retirement funding gap? Yes, according to Munnell, Orlova, and Webb (2012). In their base case, 59 percent of households fall short of the savings target if

the retirement age is 65. But if a reverse mortgage with tenure payments is widely used, only 48 percent of households fall short of the target at that retirement age. This scenario represents a significant improvement.

But is it realistic and reasonable that, among homeowners, older households would use a reverse mortgage? If so, how much retirement income could they realize? Those questions are the main subject of this paper. First, I explain how a reverse mortgage works. Then I review some of the large body of professional literature on how reverse mortgages might be used during retirement. In particular, I explore the possible reasons why reverse mortgages are not used much now. (The current penetration rate is less than 2 percent of all retired households. That rate is quite small, given that nearly 80 percent of retired households own a home, compared with about 50 percent of households that own personal retirement assets.)

In the next section of this paper, I present the results of a simulation exercise. I analyze which older households, according to survey data in the University of Michigan's 2012 Health and Retirement Study (HRS), are minimally suitable for reverse mortgages. I then discuss for whom it might be most sensible to use reverse mortgages, given the high initial and ongoing costs of such mortgages. (The poorest and richest households are also excluded for reasons given later in the paper.) At the beginning of this empirical analysis, I report extensive statistics and cross-tabs on the balance sheets and incomes of retired households, with an emphasis on the levels of their housing assets and relationships with other asset and insurance holdings, income, and preferences. The main goal of all this data work is to estimate what percentage of retired households with sufficient home value (net—that is, minus mortgage debt) and significant but not too large financial asset holdings can best use a reverse mortgage to generate significant extra periodic and continuing retirement income.

I conclude with some public policy ideas that would lower costs and increase demand for the sensible use of reverse mortgages in the United States to improve retirement security.

Product Description

I start this paper with a detailed description of the features and history of reverse mortgages and HECMs.[2] According to the US Department of Housing and Urban Development (2017), the HECM program is the Federal Housing Administration's (FHA) reverse mortgage program that enables seniors who have equity in their homes to withdraw a portion of the accumulated equity. The stated intent of the HECM program is to ease the financial burden on elderly homeowners facing increased health, housing, and subsistence costs at a time of reduced income. The FHA's mission is to serve underserved markets. That mission must be balanced with US Department of Housing and Urban Development's (HUD) obligation under the National Housing Act to protect the FHA insurance funds.

The HECM program enables older homeowners to withdraw some of the equity from their homes, either immediately or later in life (through a line of credit). They can make this withdrawal in a lump sum or over a set period of time or for as long as the borrowing owner(s) live(s) in the home.[3] One of the important differences between a HECM mortgage and a home equity loan or second mortgage is that HECM borrowers do not have to repay the HECM loan until the last surviving borrower (1) dies, (2) sells the home, (3) has not used the home as a principal residence for more than a year (e.g., after entry into a nursing home), or (4) fails to meet the obligations of the mortgage, such as paying property taxes and insurance. Under FHA requirements, to be eligible

---

[2] This section is largely based on "Frequently Asked Questions about HUD's Reverse Mortgages" on HUD's website at https://portal.hud.gov/hudportal/HUD?src=/program_offices/housing/sfh/hecm/rmtopten, viewed October 2014 and subsequently through November 2016; Stucki (2013); and Johnson and Simkins (2014).
[3] A nonborrowing spouse is allowed 12 months to vacate the house after the death of the borrower.

for a HECM the homeowner must be 62 years of age or older. (As of August 2014, a younger nonborrowing spouse is allowed, but in that case, the principal limit—described later in this paper—is lowered to reflect that spouse's age.) The homeowner must own the home outright or have a relatively low mortgage balance that can be paid off at closing with proceeds from the reverse loan, must have the financial resources to pay ongoing property charges, and must live in the home. The home must be a single-family home, or a two- to four-unit home with one unit occupied by the borrower. Condominiums and manufactured homes also may be eligible.

When the home is sold or is no longer used as a primary residence, the cash payments, interest, and other HECM finance charges must be repaid. Any proceeds from or value of the home beyond the amount owed on the HECM belong to the owner(s) or, if the owner is deceased, to the surviving spouse or estate. No debt is passed along to the estate or heirs. A HECM is a nonrecourse loan. Therefore, under some circumstances—for example, if the value of the house declines over the lifetime of the retired homeowner, if the cash payments extend for a long time, or if interest rates increase—it is possible that a relocated borrower or the estate of a deceased borrower will pay back less than the amount owed on the HECM loan.

By FHA rules, the amount available for borrowing (the "eligible benefit") varies based on (1) the age of the youngest borrower or nonborrowing spouse, (2) the current expected interest rate, (3) the lesser of the appraised value or the HECM mortgage limit of $625,500, and (4) the initial mortgage insurance premium. The older the homeowners, the more valuable their home is, and the lower the interest rate, the higher the loan amount available (although when loan interest rates are below 5 percent, the available loan amount does not differ). Historically, availability has not depended directly on income, credit history, or health. As of April 2015, however, the FHA requires lenders to assess and document a borrower's ability to pay, particularly focusing

on property taxes and insurance, before originating a loan. Borrowers must meet minimum credit, debt, and affordability standards. Borrowers failing these standards can be required to set aside a portion of their available principal in a lender-managed escrow account to cover future tax and insurance expenses.

For adjustable-interest-rate mortgages, the following payment plans are possible:

- *Tenure ("life" annuity)*: equal monthly payments as long as at least one borrower lives and occupies the property as a principal residence

- *Term ("fixed period" annuity)*: equal monthly payments for a fixed period of months selected

- *Line of credit*: unscheduled payments or in installments, at times and in an amount of the homeowner's choosing until the line is exhausted (A unique aspect of a HECM line of credit is that it rises over time by the rate of interest on the line.)

- *Modified tenure*: combination of line of credit and scheduled monthly payments for time of residence

- *Modified term*: combination of line of credit and term

- *Single-disbursement lump sum*: a single payment at mortgage closing (For fixed-rate mortgages, this is the only payment plan available. The maximum disbursement is restricted to either 60 percent of the eligible benefit or the various closing costs plus 10 percent of the benefit. This restriction was put in place in 2013 to reduce loan defaults, which were more common with this payment option.)

The line-of-credit option is now the most popular payment plan, according to HUD, chosen either alone (68 percent) or in combination with the term or tenure plan (20 percent).

According to Johnson and Simkins (2014), the reverse mortgage market apparently was quite small until 1987. In that year, HUD began the HECM program (whose product was insured by the FHA) on an experimental basis. The HECM became a permanent program in 1998. During the early years, most borrowers were elderly women who used the tenure payment plan. As the housing market heated up in the 2000s, borrowers were more likely to be couples and to use the line of credit plan. To supplement the HECM, private lenders introduced proprietary jumbo reverse mortgages and also some nonjumbo products. Since the financial crisis and housing crash, however, private jumbo lending has dried up, and HECMs now account for nearly the entire reverse mortgage market.[4] Also, the largest brand-name multiproduct lenders (Bank of America, MetLife, and Wells Fargo) left the program after the crash, reportedly because evictions of older homeowners who were not paying property taxes and insurance were difficult and harmful to their public reputations and because of relatively low volumes (Powell 2011). Also, these multiproduct financial companies were prevented by law in 2008 from marketing (cross-selling) HECMs to their existing customers; this change also may have contributed to reducing the HECM's attractiveness as a line of business. Now there are many fewer well-known lenders. American Advisors Group is the largest HECM lender, with a 25 percent market share; it employs an aggressive media outreach and call center marketing strategy.

---

[4] According to the Consumer Financial Protection Bureau (2012), Generation Mortgage was the only lender offering a proprietary product in 2012. Its Generation Plus loan has a minimum borrower age of 62 and a loan limit of $6 million. The product was available only as a fixed-rate, lump-sum loan with an 8.875 percent interest rate and an origination fee of 1.5 percent of the initial principal balance. In comparison, fixed-rate HECMs were then available with interest rates ranging from 4.5 to 5.0 percent and a low or zero percent origination fee. (Subsequently, terms on fixed-rate HECMs were tightened considerably.) The Generation Plus loan offered lower proceeds than the HECM as a percentage of home value because it was uninsured and carried a higher interest rate than HECMs. Because of the FHA's loan limit of $625,000, homeowners with multimillion-dollar homes still may have been able to receive a higher dollar amount with the Generation Plus than with the HECM. At the rates and market conditions and rules prevailing in 2012, a 62-year-old borrower could get 62 percent of his or her home's value (or the product's loan limit, whichever is less) with a HECM Standard, 52 percent with a HECM Saver, and 26 percent with a Generation Plus. A 90-year-old borrower could get 78 percent with a HECM Standard, 61 percent with a HECM Saver, and 49 percent with a Generation Plus. Only 51 loans, totaling about $48 million, have been originated through June 2012 since the Generation Plus reverse mortgage product was created in July 2010.

In 2010, HUD introduced the HECM Saver loan option, which had lower up-front fees and lower eligible borrowing amounts. HUD eliminated this loan choice in 2013. The Consumer Financial Protection Bureau (2012) criticized the complexity of the HECM product menu; because the Dodd-Frank Act gave the bureau an oversight role over the HECM program, it is possible that the bureau's criticism played a role in the FHA decision to eliminate the Saver option. Quite recently, HUD introduced changes in the HECM program that reduced the eligible benefit amount. HUD made those changes in response to concerns about recent and prospective losses to taxpayers through the FHA insurance fund.

Mortgage insurance issued by the FHA is a mandatory part of the HECM product. The premium on that insurance pays for the federal guarantee that the lender is protected against credit risk and is part of the product design (nonrecourse) that a borrower will never owe more than the value of the home. Similar to closing costs found in traditional forward mortgages, HECM closing costs include an origination fee to the lender;[5] third-party fees such as appraisal, title search and insurance, surveys and inspections, recording fees, mortgage taxes, and credit checks; and, if less than 60 percent of the available funds is accessed in the first year of the HECM, the up-front mortgage insurance premium equal to 0.50 percent of the home value. There is also a fee for mandatory counseling (about $125), which is charged to the potential borrower or sometimes paid by HUD through the Housing Counseling Grant Program. Fees that accrue over the life of the loan include interest expense, a monthly servicing fee of up to $35, and a mortgage insurance premium equal to 1.25 percent of the outstanding loan balance. The monthly adjusting interest rate is commonly set at the one-month London Interbank Offered Rate (LIBOR) plus a lender's margin of approximately 2.5 percent, with a lifetime cap of the initial

---

[5] For processing the HECM loan, a lender can charge the greater of $2,500 or 2 percent of the first $200,000 of the home's value plus 1 percent of the amount over $200,000; HECM origination fees are capped at $6,000.

interest rate plus 10 percent. According to more recent (September 2015) HUD rules and experience, the average margin was 2.185 percent, and the adjustable interest rate could be either (1) the one-month LIBOR or the one-month or one-year constant-maturity Treasury (CMT) for monthly adjustment or (2) the one-year LIBOR or one-year CMT for annual adjustment.

The eligible benefit amount is based on the age of the youngest member of the borrowing household, the home value, and the loan's expected rate. For adjustable-rate loans, the expected rate is equal to the lender's margin and the 10-year LIBOR swap rate (note that the expected rate differs from the LIBOR interest rate actually charged on the mortgage; if one of the CMTs is used for the variable rate, then the 10-year CMT is used for the expected rate). More specifically, the eligible benefit is the product of the home value and a principal limit factor, determined in turn by the borrowers' ages and the expected interest rate, minus the various initial cash payments, liens, up-front mortgage insurance, and closing costs mentioned previously and funds set aside for monthly servicing fees. For example, on October 22, 2013, for a $400,000 home owned by a person age 75, the principal limit factor based on a margin of 2.5 percent and an expected rate of 2.75 percent is 0.563, so the initial principal limit is $225,200. Further assuming $2,000 in initial mortgage insurance premium, an origination fee of $6,000 (the maximum allowed), closing costs of $2,322, and a servicing set-aside of $4,466.98 (the present value of $30 monthly for 25 years discounted using the expected rate plus the ongoing mortgage insurance premium of 1.25 percent) gives an eligible benefit amount of $210,411.02.

The term payment and tenure payment options pay out assuming a discount rate equaling the expected rate, the margin, and the ongoing mortgage insurance premium. On October 22, 2013, this discount rate was 6.50 percent. (Recall that the loan itself carries a variable rate based on LIBOR, which was 0.17 percent on that date.) The tenure option calculates monthly payments

on the assumption that the borrower will reach age 100. Regardless of the actual loan balance, payments continue even past age 100, as long as the borrower is living in the property. So the HECM includes a small element of life contingencies.

Table 1 presents selected principal limit factors under program rules as of August 19, 2014, by borrower age at origination.

Table 1. Selected Principal Limit Factors by Age of Borrower or Younger Nonborrowing Spouse at Origination

Expected mortgage interest rate (%)	Age 45	Age 55	Age 65	Age 75	Age 85
5.50	0.381	0.419	0.478	0.553	0.644
7.00	0.228	0.270	0.332	0.410	0.513
8.50	0.133	0.171	0.227	0.304	0.414

Source: FY 2014 HECM Actuarial Review, exhibit I-1.

HECM lenders are largely protected from default risk by the FHA guarantee. The guarantee covers a maximum claim amount (MCA). According to the FHA Production Report (US Department of Housing and Urban Development 2015), as of August 2015 there was about $147 billion in HECM loans outstanding, as measured by the MCA payable by HUD (the MCA is defined as 98 percent of the initial property value or the FHA loan limit, whichever is lower), and about 607,000 loans outstanding. Note that actual HECM borrowing is likely to be lower than the MCA aggregate. In 2015, there were roughly 36 million US households with a householder age 62 or older. So, quite roughly, the HECM penetration rate in the relevant population was about 1.7 percent.

According to table 6 of the *FHA Production Report* (US Department of Housing and Urban Development 2015), in August 2015, about 84 percent of HECMs were used for equity takeout; the rest were used for refinance and home purchase. About 87 percent were adjustable-

rate loans. In terms of demographics, 20 percent were issued to individual men, 41 percent to individual women, and the rest to couples. Forty-six percent were issued to those ages 62 to 69, 36 percent to those ages 70 to 79, 15 percent to those ages 80 to 89, and 3 percent to those age 90 and older. About 28 percent of loans had initial principal limits up to $100,000; 35 percent were for $101,000 to 200,000; 18 percent were for $201,000 to $300,000; almost 15 percent were for $301,000 to $400,000; 4 percent were for $401,000 to $500,000; and none were for limits above $500,000. In the past couple of years, there has been little or no growth in the HECM market.

Shan (2009) combines administrative records from HUD on HECM loans—borrower and loan characteristics and experience from 1989 to 2007—with zip code data and county-level data on demographic and socioeconomic characteristics of geographic areas of borrowers. Shan establishes some basic facts about the HECM program through most of its history. HECMs are most concentrated in California, Colorado, the District of Columbia, Nevada, and Utah, with penetration rates above 3 percent. They are least concentrated in Alabama, Iowa, Kentucky, Mississippi, North Dakota, and West Virginia, with penetration rates below 0.5 percent. In regression analysis, Shan finds that reverse mortgages are more likely to originate in geographic areas with lower incomes, higher home values, lower average credit scores, higher owner costs relative to income, better-educated residents, and higher percentages of minorities. Shan finds that loan termination rates are consistently higher than the corresponding mortality rates for the same age and gender, indicating at least some mobility risk among borrowers. Those who chose term and tenure plans were less likely to exit homes permanently within five years of loan origination than those with lines of credit; single females and couples had lower termination rates than single males; and those with higher house values exited earlier, on average. The rate of loan losses is higher for single males and line-of-credit payment plans.

According to Munnell and Sass (2014), the HECM program grew during the 2000–2010 period, from fewer than 10,000 loan originations annually in 1999 to more than 110,000 in 2008 and 2009, before falling back to around 60,000 originations in recent years. The increase was likely a result of rising home values, falling interest rates, an increased acceptance among elderly individuals of borrowing (whether secured or not), retirees' needs for cash in the recent recession, higher FHA loan limits, and a regulatory change allowing fixed-rate mortgages on lump-sum loans. The fixed-rate lump-sum payment form quickly became the norm, with borrowers taking the maximums allowed as lump sums; this payment form accounted for about 70 percent of HECM originations during 2010–2013. As reported by the Consumer Financial Protection Bureau (2012), surveys of borrowers indicated that most of these lump sums were used to pay off an existing mortgage. These institutional and economic changes caused losses to rise for the HECM program; according to the Consumer Financial Protection Bureau (2012), nearly 10 percent of borrowers were in default, and collateral that was backing HECM loans declined sharply. In response, the FHA reformed the program, cutting back on the eligible amounts and raising the insurance premium on the outstanding balance, as previously described. The FHA placed a moratorium on the standard fixed-rate full-draw HECM product in 2013.

Literature Review

In this section, I present an annotated bibliography of some of the more important studies in the literature. I begin with a focus on studies of the role that housing plays in the consumption and net worth choices and outcomes of retired households, with due consideration of the many risks (especially of uninsured spending on long-term services and supports, or LTSS) that these households face. I also review the roles of relevant public insurance and welfare programs

(especially Medicaid) and their eligibility criteria for LTSS coverage, with a view to explaining the decisions of retired households on whether to take out home equity.

The sense of the economics literature through the mid-1990s, according to Skinner (1996), was that housing wealth changes do not influence consumption and savings behavior. Also, elderly individuals do not usually spend down their housing equity in retirement. Skinner considers three models of savings for, and decumulation during, retirement in light of these apparent empirical findings: (1) the conventional life-cycle model with the addition of costs of moving and no reverse mortgage markets; (2) addition of a bequest motive or mental-accounting savings behavior; and (3) addition of uncertainty about retirement income or its obverse—uninsured health expenses. In this last, precautionary model, people use housing as a form of hedge because, in a state with expensive uninsured health care and long-term care, they can cash out housing to pay for their care or because the demand for housing will then decline.

Using both macro and micro data sources, Skinner tests these models. He does find some effect of housing wealth on savings, especially with the macro data, consistent with the conventional life-cycle and precautionary approaches. But Skinner also finds in the micro data that few retirees actually draw down their housing wealth unless they experience widowhood or other adverse events, especially health declines. For those who do tap into housing equity, the drawdown is large and quick. Neither the life-cycle model, with added moving costs and financial constraints, nor the mental-accounting model nor the bequest model can explain simultaneously these empirical observations. Rather, the precautionary model can explain all the empirical findings: homeowners spend down housing windfalls while young but not while old because housing wealth is a form of self-insurance. The precautionary approach also explains why the demand for reverse mortgages has not been strong.

Banks et al. (2010) focus on the housing transitions of older households just before, and during, retirement; they broaden the literature's measures of downsizing, look at longer sample periods (using panel datasets from 1968 to 1999 for the United States), and look at housing consumption. In general, they do find a downward path of housing consumption by age, even after controlling for changes in household size and retirement from the labor force.

Banks et al. (2010) show that slightly more than 80 percent of all Americans over age 50 are homeowners. About one in six older Americans are renters, and the rest live with relatives or in a nursing home. There is a gradual decline in the fraction who are homeowners across age groups past age 70; in the age-80-and-older category, a bit more than 60 percent are homeowners, about 30 percent rent, and almost 7 percent live with relatives or in a nursing home.

Looking at housing transitions over a decade, Banks et al. (2010) show that almost one in every three American homeowners who were at least age 50 moved out of an originally owned home. About 70 percent of these movers did, however, purchase another home. Renters are more mobile than homeowners (over a 10-year period, 72 percent of American renters moved and nearly one in four became homeowners). Examining differences by age, in the 80-plus age group for American homeowners, almost 60 percent move, mostly to rentals and more than 6 percent to nursing homes or to live with relatives. Almost 60 percent of the 80-plus-age renter group move.

Employing a regression analysis, Banks et al. (2010) find that the following factors cause downsizing: transition from married to single, widowhood, children leaving home, transition from work to no work, higher price volatility, and higher home value. They also find that higher incomes discourage downsizing. There is a clear pattern of more downsizing with advancing age, even after controlling for other demographic and income effects.

Focusing on housing and the demand for long-term care insurance (LTCI), Davidoff (2010) explains several empirical phenomena simultaneously: elderly individuals remain in their largely mortgage-free homes throughout retirement, moving only if they become seriously ill or if a spouse dies. When entering a nursing home or other expensive long-term care facility elderly individuals can use their home equity to pay for a sometimes-extended bout of care, or they may simply find it easier, psychologically, to then sell their home. This "consumption commitment" to a particular quantity of housing while well, combined with this "asset commitment" to home equity that is not spent while alive absent a move, explains the observed general lack of demand for LTCI, according to Davidoff (2010). The asset commitment implies that home equity has a payout highly correlated with that which would be forthcoming from LTCI.

Davidoff's explanation assumes (1) that the bequest motive is not too strong, (2) that Medicaid is a poor substitute for LTCI, at least for those with significant wealth, and (3) that there is effectively no reverse mortgage market. (He also abstracts from mortality risk and annuitization issues.) In the alternative, if a reverse mortgage were to be taken on the home, so that the consumption commitment would remain while the asset commitment disappeared, LTCI would be more commonly purchased. If the bequest motive were strong, then all components of wealth, including home equity, would tend to be saved, regardless of health status, and LTCI would be more commonly purchased. If Medicaid is regarded as a decent substitute for LTCI in terms of the types and quality of LTSS provided, then the public policy fact that home equity is largely exempt from the means tests for Medicaid implies that the lack of demand for LTCI is better explained by the existence of Medicaid coverage. The holding of home equity by elderly individuals would then be better explained by a bequest motive rather than by substituting for LTCI.

Davidoff (2010) uses the recent waves of the HRS panel database to show that, for a significant portion of the elderly population (those above age 62 and retired), home equity is large relative to long-term-care costs, and its payouts are highly correlated with the incidence of moving to a nursing home. In particular, in this sample, he finds that (1) uninsured nursing home costs averaged $40,000 annually in 2004, (2) 80 percent of households were homeowners, (3) the median home equity was $110,000 among owners, (4) the median ratio of home equity to total wealth among homeowners was 55 percent, (5) only 12 percent of homeowners owed any mortgage debt, and (6) the mean ratio of equity to home value rose from 0.84 among owners in their 60s to 0.96 among owners in their 90s. Davidoff also finds that trading down owner housing and moving to renting were both uncommon among the elderly except when the need for long-term care arose, and he finds that LTCI coverage was higher when the ratio of home equity to total wealth was lower.

Davidoff (2010) creates a formal economic model of LTCI demand and gives a numerical example. He shows in general that home equity crowds out LTCI. He also shows in his example that when a reverse mortgage market exists—that is, when home equity is liquid—homeowners always demand LTCI for more than 50 percent of expected LTSS costs, regardless of wealth and risk aversion. By contrast, when housing wealth is large and illiquid, LTCI demands falls almost to zero. These results are largely because of the asset commitment present in homeownership as opposed to the consumption commitment.

According to the US Government Accountability Office (2012), Medicaid paid for nearly half of LTSS expenditures—$263 billion—in 2010, representing about a quarter of total Medicaid spending. To be financially eligible for Medicaid coverage for LTSS, applicants cannot possess some types of assets above certain limits. Federal law discourages individuals from artificially impoverishing themselves to establish eligibility. In particular, those who transfer

assets during a five-year look-back period before applying for Medicaid will be ineligible for a period of time. States are responsible for assessing eligibility according to their varied rules, under broad federal guidelines.

The Government Accountability Office (GAO) conducted a survey in late 2011 to gather information on states' requirements and practices for assessing Medicaid financial eligibility. In particular, GAO examined the extent to which states required documentation of assets from applicants, obtained information from third parties to verify applicants' assets, and obtained information about applicants' assets to enforce the look-back period rules. GAO found that almost all states did ask applicants for information about income and some assets, but only 37 states asked for information about the primary residence (with some of the remainder looking at county property records). Less than half the states asked for information going back five years. All states matched reported Social Security income with Social Security Administration records, but matching with other government agencies, such as the IRS and state employment commissions, was spottier. Most states did not contact financial institutions, whether listed on the application or not. Despite a federal law requiring that, by 2011, most states implement an electronic asset verification system to obtain information from financial institutions, no states had done so, although 18 states said they had begun such implementation. In summary, the enforcement of federal Medicaid eligibility rules is spotty, and some middle- and upper-income households will get on the rolls for LTSS.

Nakajima and Telyukova (2014) use a complex stochastic simulation and empirical structural model of housing, savings, and borrowing decisions in retirement to study the determinants and extent of the demand for reverse mortgages. In their model, households can choose between home ownership and renting, and they may choose at any point to sell their

house or to borrow against their home equity. Retired households face idiosyncratic uninsurable risks from uncertainty in their life span, health, medical expenses, and house prices, and ill health may force a move into a nursing home. There is a bequest motive in the model, as well as a preference for owning and staying in one's own home. The model is estimated to match life-cycle profiles of net worth, housing, financial wealth, and home debt, based on the HRS data. Into this model, the authors introduce reverse mortgages and calculate their value to different household types, and they experiment with some policy alternatives.

The model produces quite modest welfare benefits of reverse mortgages on average—the equivalent of a lump-sum transfer of $885 per retired homeowner at age 65, or about 5 percent of one year's median after-tax income or about 0.2 percent of average net worth. This modest level of ex ante welfare improvement from access to a HECM produces a modest demand (less than 2 percent penetration of retired households, consistent with empirical observations). According to Nakajima and Telyukova (2014), this modest level of demand reflects the substantial risks that households face late in life, such as medical and long-term-care risks and house price uncertainty, as well as bequest motives (which are significant here in their estimation) and costs of the contract. Note that according to this model, even when home prices fall deterministically by 4.5 percent per year such that the HECM put options arrive deep into the money after relatively short durations, Nakajima and Telyukova (2014) still find that only a small minority of homeowners take a HECM; this finding is in contrast to the results of Davidoff (2014), who would find a large positive net expected value for the put option. In the opposite direction, in Nakajima and Telyukova's model, if house prices are certain to increase by 4.5 percent per year, welfare from and demand for a HECM increase dramatically (to $8,856 and 10 percent, respectively) because households want to front-load consumption by borrowing more. Unlike the households in Davidoff's model, households in

Nakajima and Telyukova's model are relatively unconcerned in these circumstances about the implicit cost of the put option–limited liability feature of the HECM.

Nakajima and Telyukova (2014) do find that simulated welfare improvements and HECM demand are higher among low-income and older households, as well as those with the most valuable houses or with outstanding mortgages. Recall that with a HECM, borrowing constraints are relaxed with age, whereas they tighten with age for conventional recourse borrowing. The authors find that demand for HECMs is highest for the oldest low-income households: for those in their 90s, the simulated take-up rate is 17 percent, as financial wealth runs out and healthcare costs increase. However, this simulated increase in borrowing is a counterfactual result.

The HECM can be viewed as the combination of a nondefaultable line of credit and a put option that gives borrowers the right, but not the obligation, to sell their house for the credit limit at the date of termination. Under fairly conservative assumptions, Davidoff (2014) calculates option values and finds that potential borrowers who anticipated that future price changes and interest rates would look similar to those over the past quarter century should have found the put option embedded in the HECM to be fairly priced or better. Borrowers who foresaw a significant probability of a crash even half as large as the one that actually occurred should have found the HECM an excellent deal. Averaging across states, the put option offered to younger retirees had a positive expected net present value greater than 3 percent of home value, even with high closing costs. Arizona and Florida offer fair pricing absent a crash, and they offer large values with a possible crash. The HECM has the most positive net present values in states in the interior of the United States that have experienced low average growth and typically modest price volatility. Oklahoma and Texas, which have seen low average growth and high volatility, offer the highest put option values.

There is apparently little indication that the extent of HECM use is higher in those interior US states with low average growth and modest price volatility. Almost no one uses the HECM as a pure put option, borrowing at the last moment if the option is in the money. This lack of "ruthless" credit use is further bolstered by the results of empirical investigation showing that borrowers whose loans terminated with credit limits greater than their homes' value have been no likelier to exhaust available credit than similar borrowers whose loans terminated with credit limits below collateral value, as noted by Davidoff and Wetzel (2014).

Using a rather sophisticated stochastic and integrated model of variable asset returns, interest rates, inflation, and housing prices, Pfau (2016) evaluates six retirement income strategies that involve spending using a HECM. They are (1) to delay opening a line of credit with a reverse mortgage until all other financial assets (in his analysis, a large individual retirement account [IRA]) are exhausted; (2) to open a line of credit immediately upon retirement and use it to support retirement spending first until the line is exhausted, and then turn to other investments; (3) to open the line of credit at retirement and take from it when the investment portfolio experiences a loss; (4) to use the Pfeiffer, Schaal, and Salter (2014) "coordination" strategy, with the cash reserve bucket removed, whereby the line of credit is taken or repaid depending on developments in the wealth glide path compared to the plan; (5) to open a line of credit at the beginning of retirement but use it at the end only if and when the investment portfolio is depleted (note that this strategy is not the same as, but is related to, the "ruthless" strategy described in the previous paragraph); and (6) to use tenure payments from the HECM with other spending needs filled in from withdrawals from the investment portfolio.

In his simulation analysis, Pfau (2016) evaluates the six strategies by the probability of meeting a particular spending goal in retirement (4 percent real post-tax initial spending rate,

increased subsequently by inflation), but he also considers the wealth remaining for a bequest. The fifth strategy produces the highest rate of success across retirement horizons (up to 40 years) for the retirement income goal. Pfau notes that, especially when interest rates are initially low, the line of credit will almost always be larger by the time it is needed than when it is opened later (as in the first strategy, which gives the lowest rate of success among the strategies). The other four strategies lie somewhere in the middle in terms of plan success. Adding concern for the combined legacy value of the household's assets, however, produces a somewhat different ordering of optimal strategies. At a horizon of 25 years and longer, the legacy value for the tenure payment option is the highest among the strategies. Pfau states that this is a combined result of (1) the partial home equity use preserving the portfolio longer, and (2) the fact that eventually tenure payments enter into the nonrecourse aspect of the reverse mortgage because income continues even if the loan balance has already exceeded the line of credit. The tenure payment strategy also does well, relative to the other strategies, in the lower percentiles of outcomes. Pfau concludes his analysis with the observation that strategies that open a line of credit and leave it unused run counter to the objectives of the government and its risk concerns and therefore may be eliminated in the future by federal rule changes.

The results in Warshawsky (2017) indicate broadly that, for individuals, lifetime retirement income strategies can be more effectively and generally more cheaply implemented by using immediate life annuities that are based on financial assets than by using HECMs that are based on home equity amounts. The results for couples are more ambiguous, but couples may particularly appreciate that the life annuity pays for life whereas the HECM pays only for tenure. So for households that have both financial and housing assets that are significant, the HECM—at least with a tenure payment feature—is not best used for retirement security for the production of

lifetime regular income flows. In this regard, the HECM differs from life annuities, which are widely recommended by standard economic analysis. Although immediate life annuities are not actually widely used by retired households currently, no impediments prevent them from being so used; hence, this assessment is relevant to policy analysis and recommendations, as well as to the empirical analysis of the potential HECM market. Retired households with significant financial and retirement asset holdings (generally the two upper deciles of the wealth distribution) probably should use life annuities rather than reverse mortgages on the housing asset to increase retirement income. In particular, in the later stages of empirical analysis and simulations, the focus will be on the potential use of HECMs among those retired households with some, but not too many, financial assets.

In the empirical analysis sections that follow, I begin by briefly describing the data assembly from the HRS. Then I present summary statistics and cross-tabs of key variables. Finally, I present the simulation methodology and results for potential HECM demand.

HRS Data Assembly

The University of Michigan Health and Retirement Study is a biennial longitudinal panel study that surveys a representative sample of about 20,000 people over age 50 in the United States. Since 1992, the HRS has been collecting information from various cohorts about income, pension plans, assets, employment, health insurance, and other issues regarding health, personal preferences, and personal goals.

This analysis mainly uses RAND HRS datasets. RAND HRS is a user-friendly version of a subset of the HRS. However, not all the variables needed in this analysis are available in the RAND HRS. In particular, variables about retirement (such as personal retirement savings and

defined benefit income) are not processed and available in the RAND HRS. Instead, those variables are available through the RAND Enhanced Fat Files. The RAND Enhanced Fat Files convert raw HRS data to respondent-level data, making it easier to merge with other RAND HRS datasets, and they name the variables in a logical and consistent way. Unlike the RAND HRS, however, there are no model-based imputations and cleaning of the retirement plan variables; instead, the imputations done in Warshawsky and Zohrabyan (2016) are used here.

The merged dataset used for this paper is reported at a respondent level. Wave 11, which is the 2012 survey, is used; it has a total of 20,554 observations. The age range of the respondent or spouse in the entire sample of 20,554 is 20 through 103. Here, the focus is on respondents (or spouses) in the 62–74 age range, yielding 7,792 observations. Specifically, if a respondent is single, then the age is strictly constrained to 62–74. Otherwise, if the respondent is married, one of the household members must be in the 62–74 age range for the household to be included in the dataset. Furthermore, the data are constrained to include only retired households. Note also that disabled individuals are included in the dataset.

After this constraint is imposed, 5,592 retired respondents between the ages of 62 and 74 comprise the dataset. Further, all respondents who live in nursing homes are excluded, which restricts the dataset to 5,548 (i.e., only 44 respondents live in nursing homes). Of these 5,548 respondents, 36 reported that they already had a reverse mortgage on their property (i.e., HECM). The reporting of HECM use in the HRS clearly indicates a lower rate of population penetration than the rough estimate from the administrative data calculated earlier in this paper.

The analyses conducted in this paper are on household level. Therefore, respondent-level data are converted into household-level data. Members in the same household have the same household ID (HHID) and are assigned "couple" status in the dataset. Family respondents are

considered the household "heads." All variables of interest are transformed into household level, including both members' information. The resulting household-level dataset of 3,730 observations is the foundation of analysis in this paper.

Figure 1 gives some basic information about the resources of retired households age 62– 74 in 2012. About half of those households have personal retirement savings—401(k) accounts, IRAs, or both—and half do not. Of the latter group, about 20 percent have a defined benefit plan; the rest have no formal retirement resources beyond Social Security. Of this last slice of the population, median financial assets, primary home (gross) value, and net worth are all fairly low, but about 60 percent do own a home, which perhaps could be tapped through a reverse mortgage.

Figure 1. Summary Statistics and Cross-Tabs on Housing and Financial Assets among Retired Households

Legend:
- Some retirement savings
- No DB plan or retirement savings
- DB plan, but no retirement savings

Pie chart values: 10.3%, 47.7%, 42.0%

Of the 42% with no DB plan or retirement savings:
Financial assets: $125
Annual income: $12,610
Primary house: $35,000
Net worth (nonannuity): $26,000
(median value in USD)

Primary home ownership among the 42% with no DB plan or retirement savings:
Own a home with no debt: 38.6%
Own with debt : 20.5%
Do not own a home: 40.9%

Notes: In the data presentation and empirical simulations, the pattern established by Poterba, Venti, and Wise (2011) and the US Government Accountability Office (2015) is followed. DB = defined benefit. The 47.7 percent of households that have some retirement savings include people with and without DB plans.
Source: Author.

Table 2 gives more detail about the resources of the retired households in the dataset, keying off whether they have any retirement savings. Clearly those with retirement savings are much better off on all essential measures, at the median: net worth (by a factor of 10), financial assets, income (double), home ownership rate and gross value (more than triple), and defined benefit plan coverage. Still, most of those households with no retirement savings do own a home of some value.

Table 2. Select Resources for All Retired Households Age 62–74 by Ownership of Retirement Savings, 2012

Category	Households with no retirement savings	Households with some retirement savings
Percentage of households age 62–74	52.3	47.7
Median net worth	$38,000	$383,900
Median nonretirement financial resources	$400	$35,000
Median income	$15,276	$32,400
Median primary home value (gross)	$50,000	$170,000
Percentage who own a primary home	62.8	92.6
Percentage who own a primary home that is paid off	39.3	50.9
Percentage with a defined benefit plan	19.7	50.3

Source: Author.

Table 3 gives the distribution of annuity income (composed of Social Security, pensions, and wages) for all retired households. Wages are included for these retired households because it is possible that wages represent a part-time job that may extend considerably into retirement years or may be replaced by the start of, or increase in, Social Security, pensions, or IRA distributions. There is a wide range of existing retirement income, from only $5,000 a year to more than $160,000, with a median of $22,500. Clearly, the need for techniques and products to enhance retirement income is felt more at the lower end and the middle of the income

distribution than at the upper end, but, as will be seen, assets (including housing) are more

concentrated at the middle and the upper end.

Table 3. Distribution of Annuity Income for All Retired Households Age 62–74 by Percentiles, 2012

Percentile	Annuity Income ($)
10	4,800
20	9,900
30	13,680
40	17,815
50	22,582
60	28,128
70	34,800
80	45,072
90	65,744
95	88,966
99	162,495

Source: Author.

Table 4 shows various retirement resources among all retired households by income

quintile. Having a defined benefit plan is even more heavily skewed toward upper-income

quintiles than having retirement savings, whereas owning a home that is paid off is fairly evenly

distributed across income groups, with the highest incidence of clear home ownership in the

middle quintile. Of course, Social Security income is fairly widespread, but its incidence, and its

level, is lower among the lowest quintile, which may be more likely to include those who are not

fully retired yet or are disabled or on other welfare programs. The incidence of heavy

indebtedness is fairly evenly distributed across retired households, at about one in five.

Table 4. Select Retirement Resources among All Retired Households Age 62–74 by Income Quintile, 2012

Retirement Resources	1 (bottom)	2	3	4	5 (top)
Percentage with retirement savings	20.2	30.3	46.9	64.3	76.9
Among those who have, median retirement savings	$40,000	$51,500	$73,500	$93,747	$140,000
Percentage with a defined benefit plan	5.4	14.1	30.4	55.0	67.0
Among those who have, median defined benefit income	$3,353	$3,348	$6,048	$10,692	$29,310
Percentage who own a primary home that is paid off	33.8	46.0	53.4	49.3	41.8
Among those who have, median primary home value	$100,000	$100,000	$130,000	$150,000	$200,000
Percentage with debt greater than twice annual income	28.8	17.3	20.6	23.2	17.6
Percentage with Social Security income	59.8	96.6	96.1	95.3	90.6
Among those who have, median Social Security income	$7,200	$12,960	$19,900	$25,392	$25,310

Source: Author.

In table 5, median and mean balance sheet amounts and annuity income are given by item for all retired households and then separately for single-person and married households. In 2012, there was a high prevalence (about 80 percent or more) of having financial assets, home ownership, and Social Security income. The conditional mean net home equity was $166,700, and the median was $115,000. The conditional mean Social Security income for the retired household was $18,600, and the median was $16,000. Not all households had Social Security income, presumably because some had not yet claimed retirement benefits, and some (external estimates say about 5 percent) get none because they worked their entire careers in state and local government jobs where they had no Social Security coverage. About one-third of households get defined benefit pension income, and about one-third have mortgage debt still outstanding. Financial assets, housing equity (net), and retirement savings each represent about a quarter of nonannuity net worth, on average, with the last quarter composed of sundry items, including other real estate and business assets. By any measure and for all items, married couples

are wealthier than single-member households, the latter made up of widows, widowers, and divorced or never-married individuals. Of particular note to this paper, almost 90 percent of retired married couples own a primary residence, whereas only about 60 percent of singles do.

Table 5. Balance Sheet Amounts and Annuity Incomes for All Retired Households Ages 62–74 in 2012

Items	Percentage of household with item	Mean holding	Median holding	Percentage of nonannuity wealth	Conditional on positive values	
					Mean	Median
All households						
Financial assets	78.04	$112,052	$6,000	26.49	$143,577	$19,000
Nonmortgage debt	32.84	−$3,340	0	−0.79	−$10,169	−$4,500
Primary residence (net)	77.02	$121,924	$75,000	28.83	$166,746	$115,000
Mortgages and other debt	32.17	−$33,479	0	−7.91	−$104,065	−$72,000
Secondary residence (net)	14.45	$19,308	0	4.57	$138,682	$60,000
Other real estate	11.93	$31,988	0	7.56	$268,226	$100,000
Business assets	6.86	$36,825	0	8.71	$536,546	$200,000
Personal retirement accounts	47.69	$104,190	0	24.63	$218,453	$88,000
IRAs and Keoghs	34.96	$79,226	0	18.73	$226,619	$110,000
401(k)s, similar plans	26.65	$24,964	0	5.90	$93,678	$30,000
Social Security income (annual)	87.67	$16,310	$15,216	NA	$18,605	$16,800
Defined benefit pension (annual)	34.29	$6,651	0	NA	$19,398	$12,000
Nonannuity net worth	85.09	$422,946	$139,350	100.00	$498,690	$202,279
Single-person households						
Financial assets	70.96	$63,567	$1,000	29.51	$89,579	$8,000
Nonmortgage debt	31.47	−$2,738	0	−1.27	−$8,698	−$3,800
Primary residence (net)	61.67	$76,640	$30,000	35.58	$131,609	$93,000
Mortgages and other debt	21.22	−$18,282	0	−8.49	−$86,185	−$62,000
Secondary residence (net)	7.56	$7,971	0	3.70	$113,119	$50,000
Other real estate	6.15	$11,801	0	5.48	$191,765	$80,000
Business assets	3.72	$11,295	0	5.24	$303,804	$120,000
Personal retirement accounts	31.99	$46,893	0	21.77	$146,598	$50,000
IRAs and Keoghs	23.72	$38,485	0	17.86	$162,262	$75,500

|						
401(k)s, similar plans	14.23	$8,407	0	3.90	$59,079	$10,846
Social Security income (annual)	83.33	$11,052	$11,388	NA	$13,263	$12,708
Defined benefit pension (annual)	24.81	$3,639	0	NA	$14,670	$8,988
Nonannuity net worth	75.83	$215,428	$50,443	100.00	$286,433	$104,000
Married couples						
Financial assets	83.13	$146,907	$12,000	25.68	$176,712	$30,000
Nonmortgage debt	33.82	−$3,773	0	−0.66	−$11,153	-$5,000
Primary residence (net)	88.06	$154,478	$100,000	27.00	$184,371	$130,000
Mortgages and other debt	40.05	−$44,404	0	−7.76	−$110,883	−$80,000
Secondary residence (net)	19.4	$27,458	0	4.80	$145,817	$70,000
Other real estate	16.08	$46,501	0	8.13	$289,258	$100,000
Business asset	9.12	$55,177	0	9.64	$604,723	$200,000
Personal retirement accounts	58.99	$145,380	$23,364	25.41	$246,465	$100,654
IRAs and Keoghs	43.04	$108,513	0	18.97	$252,114	$125,500
401(k)s, similar plans	35.58	$36.867	0	6.44	$103,628	$33,147
Social Security income (annual)	90.78	$20,090	$20,400	NA	$22,130	$22,000
Defined benefit pension (annual)	41.11	$8,817	0	NA	$21,449	$14,244
Nonannuity net worth	91.75	$572,129	$230,906	100.00	$624,808	$271,182

Source: Author. NA = not applicable.

I am now approaching a central point of the empirical analysis. Figures 2a, 2b, and 2c show the median potentially annuitizable (financial and retirement savings) assets and primary housing (gross value), by potentially annuitizable asset percentile intervals, for retired households. The three panels simply break up the percentile intervals roughly into thirds. In the middle third of the distribution (figure 2b), one can see the beginning of a need for HECMs, where primary housing is significant but potentially annuitizable assets are not yet large. Still, the value of housing should exceed some minimum amount to make the fixed costs of taking a HECM worthwhile. Moreover, even if a household has no bequest motive and is willing and able

to depend on Medicaid to cover expenses for LTSS, it should have some minimum level of financial assets to cover emergencies, taxes, insurance, and repairs on the house. On the upper end of the distribution, financial and retirement assets are available and are generally larger than housing and will be more naturally used to support consumption in retirement, including the potential use of immediate annuities.

More specifically, at the 30th to 35th percentiles of potentially annuitizable assets, median annuitizable assets are $2,715 and gross primary housing assets are $60,000. At the 45th to 50th percentiles, median annuitizable assets are $27,700 and housing assets are $100,000. At the 65th to 75th percentiles, median annuitizable assets are $132,300 and housing assets are $180,000. At the 95th to 99th percentiles, median annuitizable assets are $2,515,000 and housing assets are $872,000.

Figure 2a. Median Potentially Annuitizable Assets and Gross Value of Primary Housing by Potentially Annuitizable Asset Percentile Interval, Retired Households Age 62–74, 2012
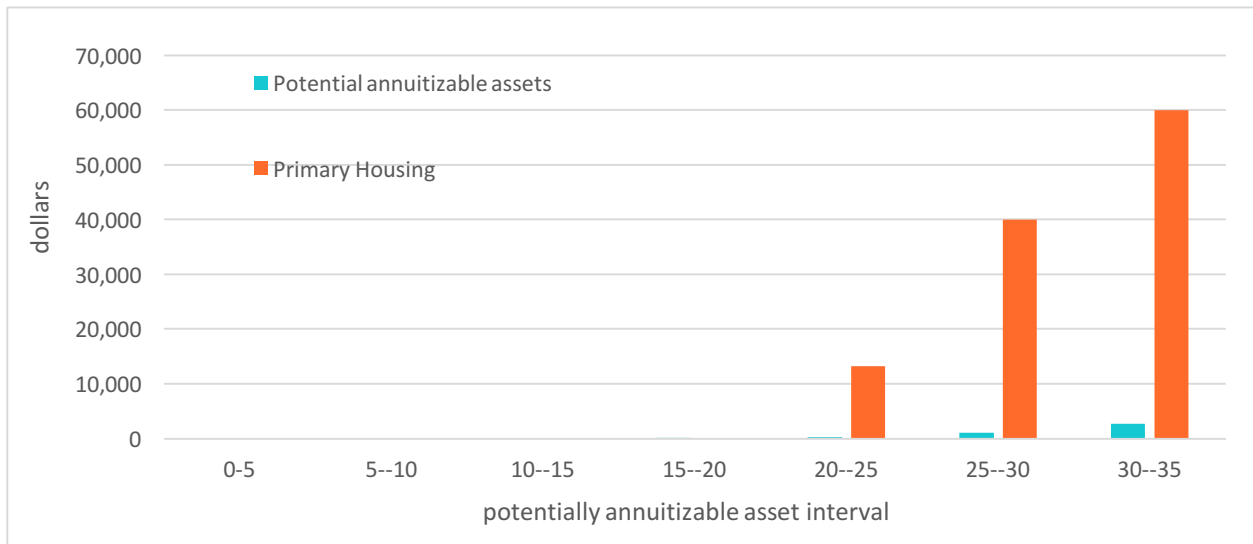
Source: Author.

Figure 2b. Median Potentially Annuitizable Assets and Gross Value of Primary Housing by Potentially Annuitizable Asset Percentile Interval, Retired Households Age 62–74, 2012
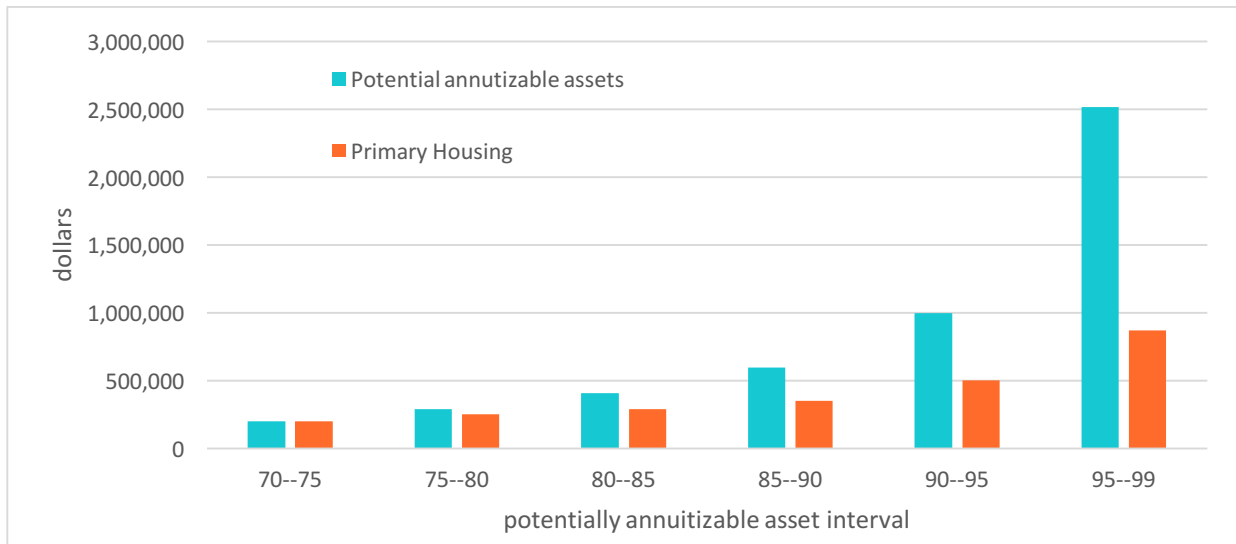

Source: Author.

Figure 2c. Median Potentially Annuitizable Assets and Gross Value of Primary Housing by Potentially Annuitizable Asset Percentile Interval, Retired Households Age 62–74, 2012
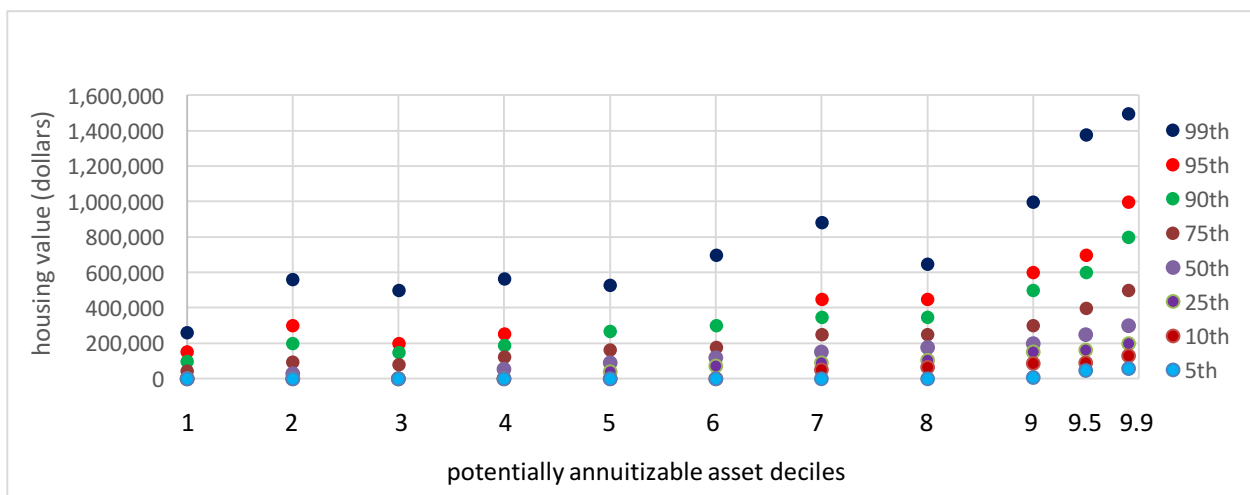

Source: Author.

Figure 3 gives more detail to the nexus of housing and assets in the retired population. It is a distributional cross-tab for these statistics—that is, it shows the percentiles of primary housing

values (gross) by the deciles of potentially annuitizable assets. More specifically, in the low-asset

deciles, there are a few households (95th percentile and above) with significant primary housing

value (that is, above $100,000), but as noted previously, little other significant financial wealth is

available to cover emergencies and contingencies. Extending into the fourth and fifth financial

asset deciles, financial assets become more significant, and there are even more percentiles (as

low as the 50th) of significant primary housing value (above $100,000). It is these latter

households that are really the best candidates for effective use of reverse mortgages.

Figure 3. Percentiles of Primary Housing Gross Values by Potentially Annuitizable Asset Deciles, Retired Households Age 62–74, 2012

Source: Author.

Next are several tables on homeownership status, LTCI coverage, and bequest motive.

Table 6 provides more detail on home ownership status across all retired households—77 percent

own, 19 percent rent, and 4 percent live with relatives or have other arrangements (recall that

those living in nursing homes have already been excluded). Statistics (not shown) indicate that

renters and those with other living arrangements are more likely to be single individuals (who are

42 percent of all retired households) than married couples (who are 58 percent of all retired households); the opposite is true of owners. Similarly, those with no retirement savings are more likely to be renters and have other living arrangements, whereas those with retirement savings are more likely to be owners. A similar relationship exists for housing ownership and potentially annuitizable assets.

Table 6. Percentage of All Retired Households by Home Ownership Status, Age 62–74, 2012

Ownership status	Percentage
Rent	18.85
Own	76.97
Other	4.18

Source: Author.

Table 7 looks at private LTCI coverage. The literature previously surveyed identifies LTCI as an important factor in the decision on whether to take a reverse mortgage, because voluntary LTCI coverage indicates a desire and perhaps a need for a household to avoid Medicaid if it also has financial, retirement, or housing assets. Overall, 15 percent of retired households have LTCI coverage of some sort. Those with coverage are more likely to be married (statistics not shown)—a result perhaps largely explained by their greater wealth. This explanation is bolstered by the positive relationship between (1) LTCI coverage and (2) retirement savings and potentially annuitizable assets. Statistics also indicate (not shown) that there is a positive relationship between LTCI coverage and home ownership. Those retired households with some assets and moderate income levels, who are less likely to be eligible for or interested in Medicaid to cover LTSS and who also own a primary home, would be more likely to take a HECM if they also had LTCI coverage.

Table 7. Percentage of All Retired Households with LTCI Coverage, Age 62–74, 2012

Coverage status	Percentage
No coverage	84.93
Coverage	15.07

Note: LTCI = long-term care insurance.

Source: Author.

Table 8 presents statistics on the extent of retired households' motive to leave a bequest. About 68 percent say that they are either very likely or somewhat likely to leave a bequest of any size (which is taken as an indication of motive, although for households with low resources it also reflects their wherewithal to do so). The motive to leave a bequest is positively associated with being married (statistics not shown), having retirement savings, having potentially annuitizable assets, and owning a primary home. The more widespread and deeper the bequest motive, the less likely it is that reverse mortgages will be selected. In particular, note the following combination of these statistics: only about one-third of retired households have no bequest motive, and of these, about half own a home. So about one-sixth of all retired households would be strongly interested in a HECM, according to this way of viewing the data.

Table 8. Percentage of All Retired Households by Bequest Motive, Age 62–74, 2012

Bequest Motive	Percentage
Very likely	62.09
Somewhat likely	5.71
Very unlikely	32.20

Source: Author.

In statistics found in the appendix of Warshawsky and Zohrabyan (2016), several of the earlier figures and tables are presented separately by four age groups: 62–64, 65–67, 68–70, and 71–74. In general, the age groups in the middle have the most retirement assets and defined

benefit plan coverage. Consistent with the earlier studies on home ownership summarized previously, the two oldest age groups have the highest rate of paid-up primary home ownership; therefore, HECM demand and focus should be placed on them.

Simulation Methodology and Results

In the initial empirical simulation of HECM demand and suitability, I first define a notion that I call *suitability*. The term simply refers to those retired households that do not already have a HECM, that own homes with any value, and that have mortgages no greater than 40 percent of the home value. This last condition is imposed because principal borrowing limits are generally about 50 percent of home value (and sometimes less).[6] With the high initial and ongoing transaction costs of a HECM, taking a HECM when the home is already mortgaged significantly is generally not a wise move. In most cases, relatively little extra cash will be produced, and even if significant extra cash could be generated, it would be cheaper, in transaction cost terms, to use a line of credit.

The following assumptions about certain HECM fees are made on the basis of industry standards. The origination fee is modeled as 2 percent of home value up to $200,000 and 1 percent above that, subject to a minimum of $2,500 and a maximum of $6,000. The closing fee is based on a regression on data for 11 states. Reflecting current HECM rules, the initial mortgage insurance premium is 2.5 percent if the mortgage is 33 percent or more of the home value and 0.5 percent otherwise. The set-aside amount for the monthly administrative fee is based on $35 monthly, discounted at the expected rate plus the mortgage insurance premium of 1.25 percent, assuming the youngest borrower reaches age 100.

---

[6] Additionally, if the HECM-suitable households end up having net principal limit (NPL = Initial principal limit − Financing fee − Present value set-aside) less than 0, they are also considered ineligible.

The principal borrowing limit and therefore the tenure payment for each household is based on the age of the youngest member of the retired household and on the expected rate (as of December 23, 2015), based on the 10-year Treasury bond, of 6.02 percent.[7]

Initial principal limit (IPL) is calculated by multiplying the principal limit factor (or principal borrowing limit) by the lesser of eligible house value or $625,000. Net principal limit (NPL) is then determined after the set-aside amount and all the financing fees are calculated—that is, NPL = IPL − Financing fees (sum of origination, closing, and mortgage insurance premium [MIP] fees) − PV (present value) of set-aside amount. Lastly, once the net borrowing amount is determined, outstanding mortgage value is subtracted to determine the actual amount available for monthly advances or for loan.

Of the total 3,730 retired households in the database, about 55 percent are suitable for a HECM, according to the aforementioned basic definition. (Starting with 77 percent of households that own housing, about 1 percent that already have a HECM are eliminated, as are approximately half of the 32 percent that have mortgages (because their mortgages exceed 40 percent of home value); the rest that are eliminated have such low housing equity that it does not cover HECM transaction costs.) In this base HECM suitability group, 40 percent have no retirement savings, 14 percent have no (nonretirement) financial assets, 60 percent have no defined benefit plan income, 66 percent are couples (compared to 58 percent overall), and 61 percent are in the two oldest age groups (compared to 56 percent of the entire sample in those age groups).

Next, consider the differences in bequest motive, health, and LTCI coverage status between those households that are HECM suitable and those that are not, with the additional

---

[7] Expected rate is the 10-year Constant Term Maturity (CTM) Treasury (as of December 23, 2015 = 2.27%) and the lender's margin (average = 2.5%) which is 4.77% for adjustable HECM. Mortgage insurance premium rate is 1.25% per annum. Thus, total rate used for calculations is 4.77% + 1.25% = 6.02%.

constraint that all have gross housing values worth at least $100,000. As seen in table 9, retired households that are HECM suitable are much more likely to give a high degree of importance to leaving a bequest and to be in excellent or good health, but they are also more likely to be covered by LTCI than those that are not HECM-eligible (mainly those with relatively large mortgages remaining). This pattern of preferences, conditions, and behavior is, on net, somewhat negative toward taking out a HECM; for example, why would a retired household that really wants to leave a significant bequest to children want to take on a reverse mortgage to increase income but reduce assets left for heirs?

Table 9. Differences in Bequest Motive, Health, and LTCI Coverage Status Variables by Basic HECM Suitability, Gross Housing Value at Least $100K

Variable	State	Suitable for HECM (%)	Unsuitable for HECM (%)
Bequest motive	High	83.78	47.73
	Mid	4.35	6.42
	Low	11.87	45.85
Health	Excellent	32.44	20.34
	Good	38.1	29.69
	Poor	29.47	49.97
LTCI coverage	No	78.19	89.68
	Yes	21.81	10.32

Note: HECM = home equity conversion mortgage; LTCI = long-term care insurance.

Source: Author's simulations.

As previously mentioned, 45 percent of retired households are not HECM suitable. An additional 10 percent of households (statistics not shown) would realize only 5 percent or less additional current annuity income from an annual HECM tenure payment (under the fee assumptions previously described), and another 10 percent would realize only 5–10 percent additional income, according to my simulations. Some retired households, however, could get large relative increases in their standard of living in retirement from a tenure-payment HECM;

about a third of the entire retired population could realize significant increases in income, defined as at least a 10 percent increase.

Next, two extra filters are placed on HECM suitability, separately and together. In particular, those with gross home values of less than $100,000 are excluded, on the view that the large fixed and variable initial fees and the ongoing costs of a HECM make it not worthwhile to take a relatively small HECM. Also, those with assets below the 30th and above the 80th percentiles of households in potentially annuitizable asset intervals are excluded. The logic here is that low-asset households, even the relatively few that are house-rich, are not the best candidates for HECMs because the house may need substantial maintenance or emergency repairs. Another factor is that all retired households need some emergency funds for family, health, and so on. In contrast, those households with significant financial and retirement assets that can be annuitized (other than housing assets) are generally better served to avoid the HECM and to a buy a commercial immediate annuity if they want or need to use their retirement savings and nonretirement financial assets; those households still would have plenty of assets available for emergencies and home maintenance. Finally, both filters are combined to identify the retired households for whom the HECM may be most indicated and appropriate.

Indeed, in support of the composition of these limits, see Consumer Financial Protection Bureau (2012, 67–68) which stated the following on the riskiness of using a reverse mortgage to pay off an existing forward mortgage or when the household has little in the way of other financial assets:

> The original purpose envisioned for reverse mortgages was to convert home equity into cash that borrowers could use to help meet expenses in retirement. Borrowers could choose between an income stream for everyday expenses, a line of credit for major expenses (such as home repairs and medical expenses), or a combination of the two. It was anticipated that most, though not all, borrowers would use their loans to age in place, living in their current homes for the rest of their lives or at least until they needed skilled

care. Upon the borrower's death, or upon leaving the home, the borrower or the estate would sell the home to repay the loan and would receive any remaining home equity.

When borrowers instead use reverse mortgages as a method of refinancing an existing mortgage (or other debt), they essentially devote their existing home equity to servicing the debt on the property. While they gain additional cash flow (that previously was going to mortgage payments) for a period of time, they lose the ability to use their home equity as a cushion against other major expenses in retirement, such as needed home repairs or medical expenses. This risk is greater for the new surge of borrowers in their 60s with sizeable traditional mortgage balances and long life expectancies.

Refinancing a traditional mortgage with a reverse mortgage may well be a good choice for borrowers in their 60s who have adequate retirement resources to cover everyday expenses and who are unable to continue working or whose employment income does not support the current mortgage. This type of borrower receives something of considerable value—the ability to remain in the current home indefinitely—in exchange for assuming a rising loan balance that will slowly consume the borrower's remaining equity.

Even for this relatively stable prospective borrower, however, choosing a reverse mortgage early in retirement is a riskier decision than it is for older borrowers with similar financial circumstances. Borrowers in their 60s have longer life expectancies than borrowers in their 70s. If borrowers in their 60s succeed in aging in place, they will most likely use up all of their home equity, but they will receive considerable benefit in exchange for that home equity. But if borrowers in their 60s *do not* succeed in aging in place indefinitely—if, due to health or other reasons they need to move at some point in their 70s or 80s—they are at high risk of having used up all of their home equity and having no financial resources with which to finance their move.

Meanwhile, if prospective borrowers *do not* have adequate savings and other retirement resources and are instead struggling to make ends meet, using a reverse mortgage to refinance an existing traditional mortgage can result in even greater long-term financial risk to the borrower. Some prospective borrowers' financial situations may be fundamentally unsustainable. Using a reverse mortgage to hold on to the home for the near term may simply postpone hard decisions, provide little long-term benefit to the borrower, and consume most or all of the borrower's home equity in the process. This type of borrower is at high risk of getting behind on taxes and insurance, and facing foreclosure on the reverse mortgage.

I now focus more closely on those HECM-suitable households for whom a HECM is more clearly appropriate, that is, those who have home values greater than $100,000; only 39 percent of all retired households are in this narrower category. Another categorization is to look only at the 50 percent of all retired households who are in the 30th to 80th percentiles of potentially annuitizable assets and who are HECM suitable (about 61 percent of these households are HECM suitable); only about 30 percent of all retired households are in the relevant financial asset

percentiles and are HECM suitable. Further carving down this latter categorization, another 22.5

percent of households in these asset percentiles would realize an increase of 10 percent or less in

annual income from a tenure-payment HECM. So all told, only about 19.25 percent (= (61 − 22.5)

× 0.5) of all retired households are HECM suitable, have sufficient but not too large financial

asset holdings, and can realize at least 10 percent more income from a HECM. Some of these

households, however, could increase their incomes substantially.

Figure 4. Distribution of the Relative Addition to Current Annuity Income by Annual HECM Tenure Payments for HECM-Suitable Retired Households with House Value > $100K and in the 30th to 80th Percentiles of the Potentially Annuitizable Asset Interval, 2012
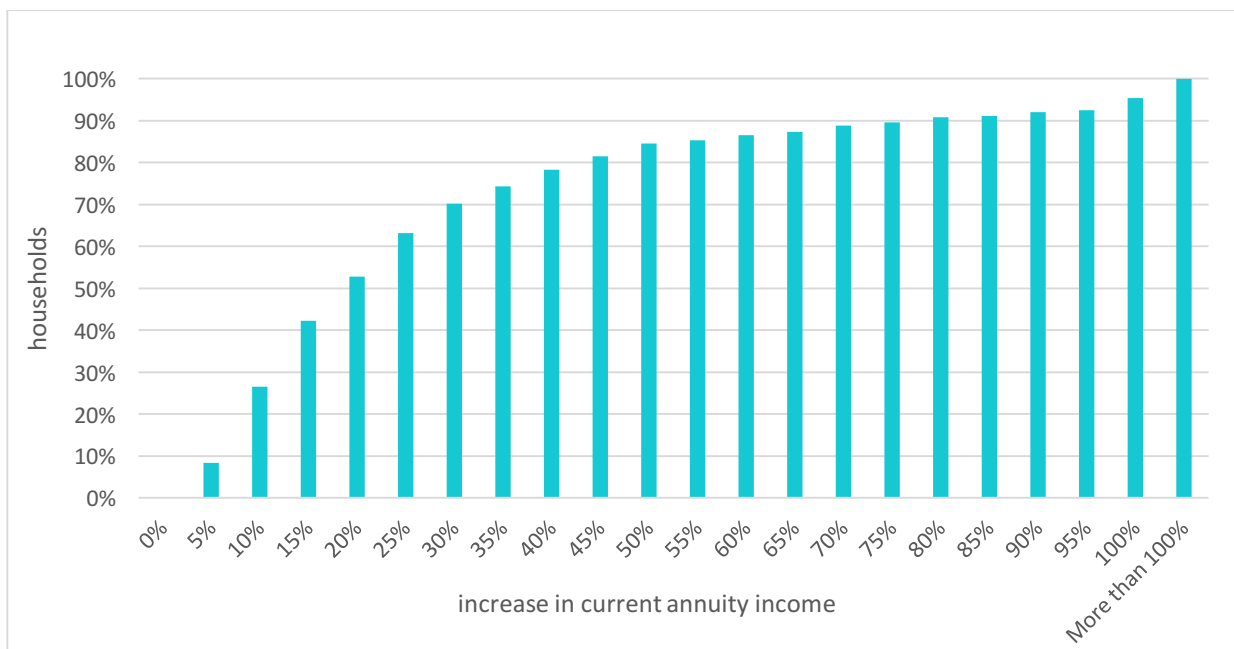
Source: Author's simulations.

In a final combination of both these filters, only 19 percent of all retirement households

are HECM suitable, have home values greater than $100,000, and are in the 30th to 80th

percentiles of potentially annuitizable asset households. Moreover, about 26 percent of these latter

households would get only 10 percent or less in additional income from a tenure-payment HECM

(see figure 4). Therefore, the number of households for whom the HECM is clearly indicated and potentially appropriate is relatively small (about 14 percent of the entire retired household population), even without considering the strength of their bequest desires or their LTCI coverage, as will be seen later. Removing the top income decile for this most appropriate group (because they probably do not need the extra income), shown in table 11, leaves an upper bound of about 12 percent of the retired household population as truly good candidates for a HECM.

Table 10. HECM-Suitable Households, with Gross House Value > $100K and in 30th to 80th Percentile of Potentially Annuitizable Asset Interval, HECM Summary Statistics

Item	Mean	Median
Household primary home value	$250,993	$200,000
Mortgage and loan on the primary home	$16,762	$0
Origination fee	$4,023	$4,000
Closing fee	$2,962	$2,802
MIP fee	$1,520	$1,000
Total financing fees	$8,505	$7,802
PV set-aside	$5,983	$5,985
Initial principal limit	$134,106	$107,868
Net principal limit	$119,618	$94,432
Eligible for monthly advances	$102,856	$84,602
Annual tenure payment	$7,256	$5,965

Note: HECM = home equity conversion mortgage; MIP = mortgage insurance premium; PV = present value.
Source: Author's simulations.

Table 10 gives some basic statistics (means and medians) for those households that are suitable for a HECM according to the initial basic definition with the two extra filters (discussed previously) applied simultaneously. In particular, the table shows the value of the primary house, the mortgage remaining, the initial and net principal limits, the various fees, the amount eligible for monthly advances (the net principal limit less any mortgages), and the annual tenure payment. The median total initial financing fees including the set-aside for monthly fees are, according to

my assumptions, as follows: total initial financing fees are $13,800 for a $200,000 house, and

$84,600 is eligible for monthly advances, producing about $6,000 annually in extra income.

Table 11 shows the distribution of current annuity income for the retired households most

likely to be interested in a HECM. Clearly, even at the lowest decile, this segment of retired

households has much higher income than the general retired household population; at the

median, income is $32,400, about $10,000 more than the general retired population. With

income of $80,000 or more, the top decile may not have a strong need for more income (from a

HECM or life annuity), in competition with precautionary savings and satisfying a bequest

motive, as previously mentioned.

Table 11. Distribution of Annuity Income for HECM-Suitable Retired Households with Gross Home Value > $100K at 30th to 80th Percentile of Potentially Annuitizable Asset Interval

Percentile	Annuity Income ($)
10	12,636
20	18,000
30	23,196
40	28,536
50	32,400
60	37,650
70	46,509
80	57,962
90	80,400
95	100,036
99	158,600

Note: HECM = home equity conversion mortgage.

Source: Author's simulations.

Table 12 gives the means and medians of the percentage change in annuity income as a

result of receiving annual HECM tenure payments for the various combinations of households

that are particularly suitable for HECMs. Because some high-value houses are included in these

calculations, the mean changes are large, particularly when the filter of house value greater than

$100,000 is applied. Most relevant, however, is the median change in annuity income for the indicated group of retired households in the 30th to 80th percentile potentially annuitizable asset intervals with a house value greater than $100,000. The change in annual income is nearly 19 percent, a significant increase in their standard of living.

Table 12. Mean and Median Percentage Change in Annuity Income Because of Annual HECM Tenure Payments for HECM-Suitable Retired Households, 2012

	All		30% to 80% asset interval	
	No restriction (%)	GHV > $100K (%)	No restriction (%)	GHV > $100K (%)
Mean	37.05	38.44	27.27	31.73
Median	15.89	21.84	14.39	18.79

Note: GHV = gross house value; HECM = home equity conversion mortgage.
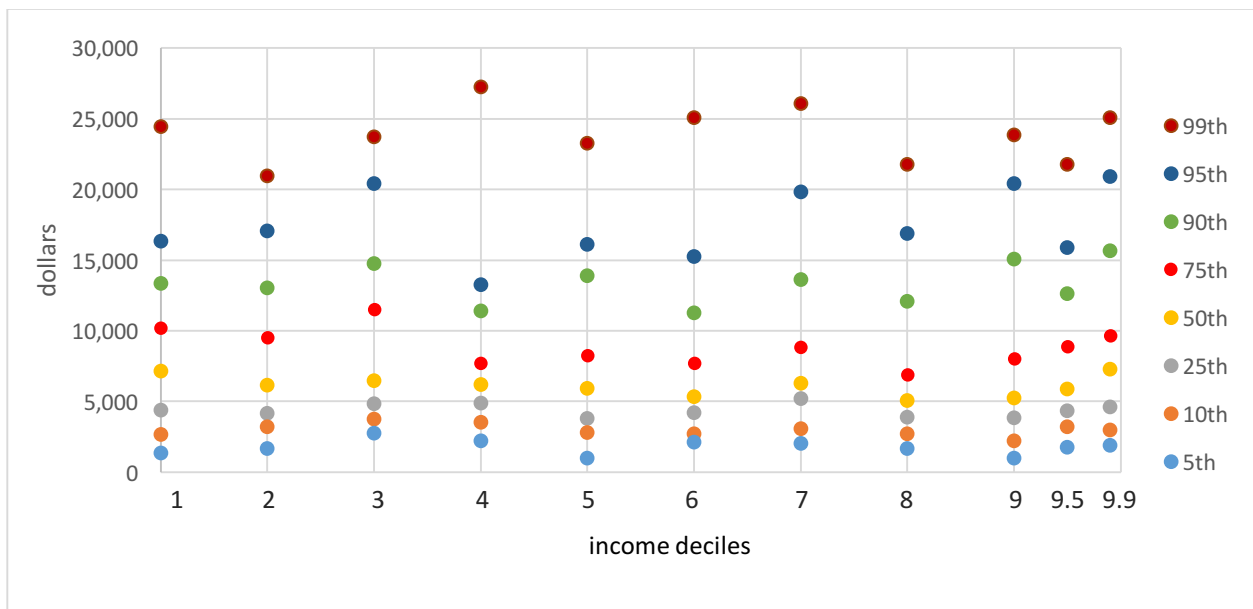
Source: Author's simulations.

Focusing further on the last, most likely HECM-using, category of households indicates a fairly wide distribution even in this smaller group that would find a HECM helpful to improving their retirement security and standard of living. Figure 5 gives the percentiles of annual HECM tenure payments for the income deciles. Clearly, even at the lowest income decile of this group, at the 50th percentile of HECM income payments, more than $7,000 in additional income can be produced by a HECM—a valuable addition for these households. But at the higher income percentiles, say at the 9th decile and above, income is probably sufficient for most households, and even the extra $25,000 in income at the 99th percentile of HECM income payments may not add that much benefit to those households, particularly when bequest motives and contingent LTSS financing needs are considered.

Moving in the direction of reducing the likely pool of HECM users, two more filters are added to the ones already applied. In particular, there is a further restriction to those households with private LTCI coverage and those with little or no bequest motive. As seen earlier, these

latter groups are relatively small compared to the overall retired population. When these screens for LTCI coverage and no interest in bequests are added to those already indicating potentially high interest in HECMs, only 4.6 and 1.3 percent, respectively, of the entire retired population will likely get a HECM.

Figure 5. Percentiles of Annual HECM Tenure Payments by Income Decile (HECM-Suitable Households with GHV > $100K at 30th to 80th Percentile of the Potentially Annuitizable Asset Interval

Note: GHV = gross house value; HECM = home equity conversion mortgage.
Source: Author's simulations.

Finally, consider successive simulations whereby (1) all the initial costs of getting a HECM are cut in half across the board, (2) the costs are cut while also consistently halving the initial principal loan limit, and (3) the costs and loan limit are cut while the requirement to have housing worth at least $100,000 to $50,000 is also cut. A cut in initial costs might happen by regulatory fiat, given the power wielded by the FHA over the HECM market, perhaps encouraged by the Consumer Financial Protection Bureau. But it is also possible that such a cut,

taken by itself, would harm the marketing and administrative functioning of HECM lenders and not cover the risks to the federal government and the lenders engendered by the current structure of the product. Therefore, in the second step, the cut in initial costs is accompanied by a similar cut in the initial principal loan limit, on the theory that at least some of the administrative expenses and costs to cover the financial and insurance risks are positively, directly, and linearly related to the size of the HECM loan. In the third step, the logical loop is completed, and my own imposition of a $100,000 minimum gross value for the house is reduced by half, to $50,000, to be consistent with the original reasoning. The fixed initial costs do not make taking a HECM loan below a certain size a reasonable decision, and now these costs are reduced.

Table 13, equivalent to table 10 presented earlier, shows the effects of cutting in half the initial costs of getting a HECM. All the various fees are halved; the amount eligible for monthly advances increases by about $7,000 at the mean and by about $6,000 at the median, while the annual tenure payment increases by about $500 at the mean and $400 at the median.

Table 13. HECM-Suitable Households, with GHV > $100K and in 30th to 80th Percentiles of Potentially Annuitizable Asset Interval, HECM Summary Statistics (Half Initial Costs)

Variable	Mean	Median
Household primary home value	$249,587	$200,000
Mortgage and loan on the primary home	$16,762	$0
Origination fee	$2,010	$2,000
Closing fee	$1,480	$1,401
MIP fee	$758	$500
Financing fees	$4,248	$3,901
PV set-aside	$2,991	$2,993
Initial principal limit	$133,795	$107,736
Net principal limit	$126,555	$100,898
Eligible for monthly advances	$109,793	$90,871
Annual tenure	$7,744	$6,405

Note: GHV = gross house value; HECM = home equity conversion mortgage; MIP = mortgage insurance premium; PV = present value.
Source: Author's simulations.

As seen in table 14a, the cut in initial costs does cause a larger increase in annual income from HECM tenure payments of about 2 percentage points—a significant income increase and improvement in welfare. However, the increase in the penetration rates, which would arise from the lower initial costs allowing some to borrow who could not do so before under the basic HECM suitability conditions initially imposed, is quite modest and, at the most restricted criterion for HECM demand, nonexistent.

Table 14a. Mean and Median Percentage Change in Annuity Income Because of Annual HECM Tenure Payments for HECM-Suitable Retired Households, Half Initial Costs, 2012

	All		30% to 80% asset interval	
	No restriction (57% of HHs) (%)	GHV > $100K (39% of HHs) (%)	No restriction (28% of HHs) (%)	GHV > $100K (19% of HHs) (%)
Mean	40.50	40.81	30.34	33.71
Median	17.28	23.57	15.99	20.37

Note: GHV = gross house value; HECM = home equity conversion mortgage; HH = households.
Source: Author's simulations.

As shown in table 14b, a cut in the initial principal limit accompanying the cut in initial costs significantly reduces the income produced by the HECM and lowers the penetration rate somewhat. The reason for the cut in income is obvious—fewer resources (home value) are now available to produce income. The lower penetration rate occurs because the lower initial principal limit loan amount is less likely to meet the conditions for the basic HECM suitability originally established; when considering mortgages, this includes sufficient home equity as a percentage of home value. Therefore, such a two-step adjustment, taken alone, is probably not worthwhile unless an increase in HECM penetration rates would also arise as a result.

Table 14b. Mean and Median Percentage Change in Annuity Income Because of Annual HECM Tenure Payments for HECM-Suitable Retired Households, 2012, Half Initial Costs and Half Initial Principal Limit

	All		30% to 80% asset interval	
	No restriction (49% of HHs) (%)	GHV > $100K (34% of HHs) (%)	No restriction (25% of HHs) (%)	GHV > $100K (17% of HHs) (%)
Mean	20.99	21.16	15.34	17.86
Median	8.32	11.28	7.60	9.94

Note: GHV = gross house value; HECM = home equity conversion mortgage; HH = households.

Source: Author's simulations.

Table 14c. Mean and Median Percentage Change in Annuity Income Because of Annual HECM Tenure Payments for HECM-Suitable Retired Households, 2012, Half Initial Costs and Half Initial Principal Limits

	All		30% to 80% interval	
	No restriction (49% of HHs) (%)	GHV > $50K (46% of HHs) (%)	No restriction (25% of HHs) (%)	GHV > $50K (23% of HHs) (%)
Mean	20.99	21.36	15.34	15.64
Median	8.32	8.88	7.60	7.93

Note: GHV = gross house value; HECM = home equity conversion mortgage; HH = households.

Source: Author's simulations.

In contrast, table 14c shows a tradeoff between (1) lower loan limits (and therefore lower income) and (2) lower costs and higher penetration rates, resulting from a change in the allowance for HECM borrowing to include gross home values greater than $50,000 rather than $100,000. For example, focusing on the most appropriate segment of the population to be using a HECM, the penetration rate among all retired households would increase to 23 percent from 19 percent (see earlier discussion), although the average increase in monthly income would decline significantly, to 8 percent at the median from 19 percent. It is indeed a judgment call whether the tradeoff is worth it. Some might say yes, particularly as the change would allow those in the lower distribution of housing value to participate in the HECM market (see table 15—to $160,000 median gross housing value from $200,000). In addition, some would agree with this

change if government guarantees were no longer needed and the market could therefore be made

more competitive and innovative.

Table 15. HECM-Suitable Households, with HV > $50K and in 30th to 80th Percentile of Potentially Annuitizable Asset Interval, HECM Summary Statistics (Half Initial Costs and Half Initial Principal Limits)

Variable	Mean	Median
Household primary home value	$204,073	$160,000
Mortgage and loan on the primary home	$6,161	$0
Origination fee	$1,816	$1,600
Closing fee	$1,396	$1,323
MIP fee	$494	$400
Financing fees	$3,706	$3,323
PV set-aside	$2,918	$2,961
Initial principal limit	$55,273	$45,473
Net principal limit	$48,650	$39,502
Eligible for monthly advances	$42,488	$34,915
Annual tenure	$3,005	$2,466

Note: HEMC = home equity mortgage conversion; HV = home value; MIP = mortgage insurance premium; PV = present value.

Source: Author's simulations.

Public Policy Ideas

I have asserted, on the basis of my own judgment and that of others, that in its current structure,

with its high initial and ongoing costs, the HECM program is not well suited to use by retired

households with modest amounts of home equity and very low financial assets. Moreover, on the

basis of the primary purpose of the program, as well as stochastic simulation research cited

previously, the tenure-payment HECM should be the focus of the HECM program. There is

certainly a segment of households that are house rich but that have relatively modest assets and

incomes, but this segment is somewhat limited, according to the empirical analysis. When one

considers the bequest motives and contingent LTSS financing needs (that is, those without LTCI

coverage) that are clearly present even in this segment, the potential demand for HECMs is reduced even more.

The high initial and ongoing costs of the HECM seem to be justified by the need to cover the marketing costs of the lesser-known lenders, with the large multiproduct financial institutions out of the market because of its limited scope and the product's generally poor reputation. One might be satisfied with this outcome, which indeed reflects current conditions, relegating the HECM to a relatively small player in the retiree financing marketplace. But one must consider the likely consequences of such an outcome. Many households that could benefit from reverse mortgages will not benefit; the federal government, with its large risk exposure, will continue to experiment with the product in a futile search for success; and lesser-known lenders, with their marketing challenges, will be the main private-sector conduits—a second-best scenario.

Clearly, the ruthless borrowing strategy mentioned in the professional literature is an abuse of the federal program that provides subsidized risk insurance protection, and there should be an appropriate and significant charge for the put option value that presents the largest risk to the federal government. In this way, it is likely that the initial and ongoing insurance premiums could be reduced. Moreover, if the program were redesigned to lower the borrowing limits with lower costs to increase its appeal to the retired population, risk to lenders could be further reduced, thereby further lowering the cost of the product. Although it is hard to see exactly how the various mortgage closing fees could be reduced in a mortgage product, at least the origination fee and mortgage insurance can be reduced without an increase in the interest-rate spread. With lower fees and a somewhat simpler menu of possible uses, perhaps the reverse mortgage product could gain more hold of the marketplace without the need for expensive advertising, thereby existing in a virtuous and sustainable cycle of lower costs and greater use.

Indeed, one has to ask—as did George Mason University finance professor Anthony Sanders in his 2012 congressional testimony on the HECM program—whether it is appropriate for the federal government to guarantee and subsidize reverse mortgages for seniors (Sanders 2012). Has the government's regulatory structure surrounding the reverse mortgage market put an end to market experimentation and competition? For example, larger institutions in the private sector might offer reverse mortgages with lower principal limit factors than HECMs; those reverse mortgages could be underwritten by the private sector within its tolerance for risk, with allowance for more robust internal marketing, and competition among providers would keep costs low. Indeed, most reverse mortgage programs abroad do not have government backing, and before the housing crisis, even in the United States, small but significant private jumbo and nonjumbo reverse mortgage markets existed. Indeed, it is clear that the HECM program has completely crowded out the private market. For example, Fannie Mae discontinued its Home Keeper product in 2008 when the Housing and Economic Recovery Act increased loan limits for the HECM product, thereby eliminating the need for Home Keeper (Consumer Financial Protection Bureau 2012).

The current reverse mortgage industry, essentially HECM marketers, has grown dependent on government subsidies and guarantees. The real question is, what is the policy justification for taxpayer subsidization of reverse mortgages to seniors who have considerable housing equity? Certainly there is no justification for subsidies for sophisticated, wealthy investors who use HECMs in complex asset management strategies. Hence, lowering the current $625,000 housing value maximum for the HECM is an appropriate interim step that will focus government resources where the policy need is the greatest and will allow for the expansion of a private reverse mortgage market.

Putting aside this fundamental policy question, what other public policy changes could be made that would increase the utility of the HECM? In my opinion, they mainly deal with removing the need to keep the house as a contingent asset to pay for long-term services and supports. The analysis by Davidoff (2010) leads naturally to viewing favorably the policy proposal by Ahlstrom, Tomlinson, and Lambrew (n.d.) to link reverse mortgages and LTCI. Indeed, bundling LTCI with immediate life annuities may also result in cost advantages on the annuity segment and a lessened need for underwriting and therefore lead to wider availability of LTCI. Also, eliminating Medicaid's favorable treatment (through exclusion) of home equity might spur LTCI and reverse mortgage demand, even with some bequest motive.

Some inkling of this policy connection has been already recognized. According to Ahlstrom, Tomlinson, and Lambrew (n.d.), there was apparently some legislation in 2000 and some regulatory activity in 2004 to have the FHA waive the initial premium for HECM mortgage insurance if all proceeds of the loan were used to pay for LTCI. Why such a strict tie would be thought attractive to potential HECM borrowers is not clear. Indeed, after a proposed rule submitted for public comment in November 2004 that would have allowed for a waiver of the HECM upfront mortgage insurance premium if the proceeds were used to purchase LTCI, this waiver provision did not make it into final rulemaking. Ultimately, HUD determined that this policy would be of little benefit to the average HECM borrower because LTCI is designed to protect one's financial assets, and most HECM borrowers have few (if any) financial assets to protect. Therefore, the use of home equity to pay for LTCI without financial assets to protect was determined not to be in the best interest of the HECM borrower.[8]

---

[8] Email communication from Josephine Huang, Department of Housing and Urban Development, November 24, 2015.

The underlying policy logic appropriately tying the HECM with LTCI, however, does indicate that improvements in the LTCI product and marketplace would have positive spillover effects on the extent and quality of HECM activity. That is, among those middle-income and modest-asset retired households that do not want to rely on Medicaid for LTSS, that are not so concerned about a bequest but are on the edge of using a HECM to improve their standard of living in retirement, better and cheaper LTCI would help. Of course, in recent years things have gone in the opposite direction: the private LTCI market has shrunk, Medicaid coverage has expanded, and the remaining private LTCI product has become less effective as insurance against large spending risks. Perhaps renewed attention should be given to product innovations, such as those proposed by Brown and Warshawsky (2013), to give some tax advantage to a combined LTCI–life annuity policy, called a *life care annuity*, which would need little underwriting (unlike traditional LTCI) and could be offered more cheaply than the two segments of the product sold separately.

Summary and Conclusions

According to the FHA, the HECM, a government-sponsored reverse mortgage, is designed to enable elderly homeowners to convert the equity in their homes to monthly streams of income or lines of credit. Loan proceeds are paid out according to a payment plan selected by the borrower. Unlike a traditional forward residential mortgage, which is repaid in periodic payments, a reverse mortgage is repaid in one payment, after the death of the borrower or when the borrower no longer occupies the property as a principal residence. The HECM is a nonrecourse loan. This means that the HECM borrower (or his or her estate) will never owe more than the loan balance

or the value of the property, whichever is less, and no assets other than the home must be used to repay the debt. The HECM has neither a fixed maturity date nor a fixed mortgage amount.

Eligible borrowers are persons 62 years of age or older. Eligible properties are one-unit dwellings, including units in condominiums. Eligible borrowers should own their homes free and clear or with liens not exceeding the principal limit. The amount that the borrower can receive from a reverse mortgage is determined by calculating the principal limit. The figure increases monthly and represents the maximum payment that a borrower may receive. The principal limit at origination is based on the age of the youngest borrower, the expected average mortgage interest rate, and the maximum claim amount. The maximum claim amount is the lesser of the appraised value of the property or the maximum mortgage amount for a one-family residence that HUD will insure in an area under section 203(b)(2) of the National Housing Act.

The borrower has the choice of receiving the mortgage proceeds through five basic payment plans: (1) tenure, (2) term, (3) line of credit, (4) modified tenure, and (5) modified term. The borrower will be able to change the type of payment plan throughout the life of the loan. The borrower may change the term of payments, receive an unscheduled payment, suspend payments, establish or terminate a line of credit, or receive the entire net principal limit (i.e., the difference between the current principal limit and the outstanding balance) in a lump-sum payment.

Interest may accrue at a fixed or adjustable rate, as negotiated between the borrower and the lender. After closing, the borrower will not be able to change from a fixed rate to an adjustable rate or vice versa. The borrower is required to receive counseling before the HECM application is processed. Counseling will be provided by HUD-approved housing counseling agencies and will focus on the different types of home equity conversion mortgages available,

the suitability of a home equity conversion mortgage for the borrower, and the alternatives to a home equity conversion mortgage.

The borrower will be charged mortgage insurance premiums (MIP) to reduce the risk of loss in the event that the outstanding balance, including accrued interest, MIP, and fees, exceeds the value of the property at the time that the mortgage is due and payable. A one-time nonrefundable initial MIP will be assessed at closing (equal to 2.5 percent of the maximum claim amount if more than 60 percent of available funds are accessed in the first year; 0.50 percent otherwise). The MIP may be paid in cash by the borrower or may be added to the outstanding balance. It must be remitted by the lender to HUD before the loan can be endorsed. A monthly MIP equal to one-twelfth of the annual rate of 1.25 percent of the outstanding balance will be assessed throughout the life of the loan. The MIP will be added to the outstanding balance and remitted to HUD monthly by the lender.

After a comprehensive review of a large empirical and theoretical economic and practitioner body of literature, I asked how reverse mortgages might be used during retirement, and I explored the possible reasons given in the literature for why they are not used much now. The current penetration rate is less than 2 percent of all retired households, which is quite small given that nearly 80 percent of retired households own a home, compared to only about 50 percent with retirement assets, and given that retirement security for many households is considered to be quite precarious. I concluded the following: for some retired households, housing is a flexible service and asset; those households move frequently, rent, downsize, and so on. Hence, there is nothing special about housing assets for them, and if needed, they will sell their home. Moreover, for some households, particularly those of advanced old age, living in their current single-family house may be detrimental to their welfare because the house is poorly

designed to accommodate disabilities and frailty, because it is simply too large and requires difficult and expensive upkeep, or because it leads to social isolation as friends, neighbors, and relatives move or pass away.

For many other households, however, housing is not just another asset, and it may be uniquely positive. It represents a relatively fixed and stable flow of services, a sense of community, and a body of memories that retired households can and do appreciate for a considerable part of their remaining lives. For some fortunate households in this latter group, modest consumption demands and generous pensions and sufficient retirement assets obviate the need to give up housing equity, to be used for whatever purpose. But many other households, particularly those in the lower and middle income classes, may have a strong need for more retirement resources to be gained from housing equity. For them, there are different ways to access funds from the home and still live there, such as home equity lines of credit, cash-out refinancing mortgages, and reverse mortgages. However, the home equity line of credit and refinancing strategies require repayment during the lifetime of the household, which could be difficult if resources and retirement income are quite tight. Hence, the reverse mortgage, which does not require repayment until the last member of the household leaves the home, could represent a solution to the need to increase retirement income while remaining in the home.

At the same time, many retired households do not want to give up, through a reverse mortgage, the asset value that housing equity represents, even though they can still experience the same flow of services. For many, the bequest motive is strong. For many other households, especially in the middle and upper middle of the income and net worth distribution, the house is being held in reserve, as a specific contingency asset to pay for uninsured LTSS expenses. For them, Medicaid insurance is (thought to be) either unavailable or undesirable, and the eligibility

rules and estate recovery programs may be (considered to be) enforced sufficiently strongly in many states to discourage gaming behavior. In other words, there is significant precautionary demand for savings in the form of housing that is not satisfied if a HECM is used. For others, perhaps somewhat lower in the asset and income distributions, Medicaid coverage of LTSS is satisfactory, and state estate recovery efforts are regarded as sufficiently weak that holding onto housing assets (and not taking out a HECM) is the better option, to leave a small bequest or for other purposes. Clearly, if effective and efficient LTCI were more widely available and used, and if the availability of Medicaid coverage for LTSS were simultaneously tightened and more effectively policed, these latter groups might find reverse mortgages more attractive, to enable them to increase their consumption in retirement while healthy.

Finally, for still others—this is a group of unknown number—Medicaid coverage or private LTCI for LTSS is available and desirable, their bequest motive is modest, and their financial wealth is relatively small, but their net housing wealth is significant. This last group may find that a line of credit or a tenure reverse mortgage improves their welfare, and indeed there is evidence that it is precisely this type of household that is using HECMs. But the considerable up-front and ongoing transaction costs reduce the value of the HECM as a way to realize home equity in the most common and simple uses, particularly for relatively modest amounts. Moreover, historically, defaults have been quite high when large initial withdrawals were allowed.

A complex stochastic simulation model of HECM demand indicated that HECMs are not used commonly because of a significant bequest motive present in the retired population and because the product is expensive in its initial and ongoing terms. The sophisticated theoretical and personal finance analyses that justify the transaction costs (including the initial and ongoing spread and mortgage insurance premium) by the large put value of a HECM are not persuasive as

a way that people, particularly those of modest means, should behave. Nor are they consistent with the results of empirical studies of actual borrower behavior. In particular, the ruthless borrowing strategy seems to be an abuse of the program, and it is clearly undercharged because no ongoing fee is assessed for the contingent use of the growing line of credit. The other somewhat esoteric and varied uses of line-of-credit HECMs for retirement planning and asset allocation purposes would seem to be most appropriate for households with significant net worth, a group for whom the public policy goals and any subsidies from the federal government of the HECM program are not designed or appropriate. In any case, the current result of the give-and-take in the financial planning literature is that, on balance, the tenure payment option is the best overall use of the HECM. That payment plan is indeed most consistent with the retirement security policy intent of the program, and following is the one I simulate for retired households in the database.

A tenure payment HECM, even with high fees, might be appropriate for retired households with both housing and financial assets if the terms for HECM payments were better than those for life annuities in the commercial market. Several things are immediately apparent from a comparison of current terms for HECMs and life annuities, as shown in Warshawsky (2017). The net limits and monthly income produced by tenure HECMs do not differ by individual versus couple, by gender, or by the extent of the age span in the couple. These variables do, however, influence life annuity pricing, or its obverse, monthly income, for the same initial borrowing and single-premium amount. In general, the monthly income for individuals is lower for HECMs compared to life annuities—particularly for older individuals and males (for whom mortality considerations are likely more important than interest rates, at least at current low interest rate levels). By contrast, for couples, HECMs produce somewhat

higher monthly income across all ages and age spreads, although the income from the life annuity improves relatively when the age spread among the couple widens and as they age.

These results indicate broadly that, for individuals, the implementation of lifetime retirement income strategies can be more effectively and generally more cheaply done using immediate life annuities based on financial assets than by HECMs based on home equity amounts. The results for couples are more ambiguous, but they may particularly appreciate that the life annuity pays for life, whereas the HECM pays only for tenure. So for households that have both financial and housing assets that are significant, the HECM with a tenure payment feature is not best used for retirement security for the production of lifetime regular income flows, in contrast to life annuities, which are widely recommended by standard economic analysis. Although immediate life annuities are not widely used by retired households now, no impediments prevent from them being so used. Hence, in the later stages of empirical analysis and simulations, I mainly focus on the potential use of HECMs among those retired households with some, but not too many, financial assets.

One can also state the implications of the essence of this professional literature on reverse mortgages in terms of the appropriate direction of public policy. Initial and ongoing HECM product costs should be lowered. Moreover, demand for HECMs would increase and government risk exposure decrease if LTCI were improved and sold more widely. Similarly, demand for HECMs would rise if the Medicaid eligibility rules were tightened and administered more effectively.

The bottom line is that 12–14 percent of all retired households are suitable for, and might sensibly use, HECMs. If coverage by LTCI or a low bequest motivation is added to the use criteria, the percentage of retired households that can reasonably be expected to get a HECM falls further, to 4.6 percent or even as low as 1.3 percent. A 12 percentage point rate of

penetration would increase the current size of the reverse mortgage market almost seven times over, and the retirement welfare of those elderly households could be significantly improved; at the median, annual income would be increased by about $6,000, or around 19 percent. Moreover, the welfare improvement, although not necessarily the penetration rate, could be made even larger (income increased by 2 percentage points) if the initial and ongoing costs of the HECM were reduced by half. If, however, the reduction in costs could be accomplished only by a comparable reduction in the principal loan limit, then the resulting loss in income (halving) is not counterbalanced by an increase in the penetration rate. But if lower value homes are now considered to be sensibly suitable because of the decrease in the fixed costs of the HECM, there is a legitimate tradeoff between the lower average improvement in consumer welfare of retired elderly households (8 percent of income at the median) and a higher penetration rate among households (as high as 23 percent). Moreover, with a lower principal loan limit, there is no longer much of a need for government backing to the product because the default risk to lenders is lowered; the mortgage insurance premium would naturally be lowered. This reduction in overall costs and fees in the private market could also possibly lead to a sustainable, innovative, and competitive market, including large financial organizations with significant marketing capabilities, to help retired households of modest means.

In my public policy section, I suggest that initial and ongoing reverse mortgage and HECM product costs could be lowered and large financial companies would enter the market, even if it were necessary to lower the borrowing limit and maximum home value allowed to accomplish that essential goal. Moreover, demand for HECMs would increase if private LTCI were improved and sold more widely. Similarly, demand for HECMs would rise if the Medicaid eligibility rules were tightened and administered more effectively.

References

Ahlstrom, Alexis, Anne Tomlinson, and Jeanne Lambrew. n.d. [likely 2004]. "Primer: Linking Reverse Mortgages and Long-Term Care Insurance." Brookings Institution Retirement Security Project, Brookings Institution and George Washington University, Washington, DC.

Banks, James, Richard Blundell, Zoë Oldfield, and James P. Smith. 2010. "Housing Price Volatility and Downsizing in Later Life." In *Research Findings in the Economics of Aging,* edited by David Wise, 337–79. Chicago: University of Chicago Press.

Brown, Jason, and Mark Warshawsky. 2013. "The Life Care Annuity: A New Empirical Examination of an Insurance Innovation That Addresses Problems in the Markets for Life Annuities and Long-Term Care Insurance." *Journal of Risk and Insurance* 80 (3): 677–703.

Consumer Financial Protection Bureau. 2012. *Reverse Mortgages: Report to Congress*, June 28.

Davidoff, Thomas. 2010. "Home Equity Commitment and Long-Term Care Insurance Demand." *Journal of Public Economics* 94 (1–2): 44–49.

———. 2014. "Can 'High Costs' Justify Weak Demand for the Home Equity Conversion Mortgage?" Working paper, University of British Columbia, Vancouver.

Davidoff, Thomas, and Jake Wetzel. 2014. "Do Reverse Mortgage Borrowers Use Credit Ruthlessly?" Working paper, University of British Columbia, Vancouver.

Johnson, David W., and Zamira S. Simkins. 2014. "Retirement Trends, Current Monetary Policy, and the Reverse Mortgage Market." *Journal of Financial Planning* 27 (3): 52–59.

Munnell, Alicia H., and Steven A. Sass. 2014. "The Government's Redesigned Reverse Mortgage Program." Issue in Brief No. 14–1, Center for Retirement Research at Boston College, Newton, MA.

Munnell, Alicia H., Natalia Orlova, and Anthony Webb. 2012. "How Important Is Asset Allocation in Retirement?" Working Paper No. 2012-13, Center for Retirement Research at Boston College, Newton, MA.

Nakajima, Makoto, and Irina Telyukova. 2014. "Reverse Mortgage Loans: A Quantitative Analysis." Working Paper No. 14-27, Research Department, Federal Reserve Bank of Philadelphia.

Pang, Gaobo, and Mark Warshawsky. 2014. "Retirement Savings Adequacy of U.S. Workers." *Benefits Quarterly,* First Quarter 2014: 29–38.

Pfau, Wade D. 2016. "Incorporating Home Equity into a Retirement Income Strategy." *Journal of Financial Planning* 29 (4): 41–49.

Pfeiffer, Shaun, C. Angus Schaal, and John Salter. 2014. "HECM Reverse Mortgages: Now or Last Resort?" *Journal of Financial Planning* 27 (5): 44–51.

Poterba, James M., Steven F. Venti, and David A. Wise. 2011. "The Composition and Drawdown of Wealth in Retirement." NBER Working Paper No. 17536, National Bureau of Economic Research, Cambridge, MA.

Powell, Robert. 2011. "Banks Abandon Reverse-Mortgage Business." *Market Watch,* June 30.

Sanders, Anthony. 2012. "Oversight of the Federal Housing Administration's Reverse Mortgage Program for Seniors." Testimony before the House Committee on Financial Services, Subcommittee on Housing, Insurance and Community Opportunity, 112th Cong., May 9.

Shan, Hui. 2009. "Reversing the Trend: The Recent Expansion of the Reverse Mortgage Market." FEDS Working Paper No. 2009-42, Board of Governors of the Federal Reserve, Washington, DC.

Skinner, Jonathan S. 1996. "Is Housing Wealth a Sideshow?" In *Advances in the Economics of Aging,* edited by David Wise, 241–72. Chicago: University of Chicago Press.

Stucki, Barbara. 2013. "New Directions for Policy and Research on Reverse Mortgages." *Public Policy and Aging Report* 23 (1): 9–13.

US Department of Housing and Urban Development, Office of Risk Management and Regulatory Affairs, Office of Evaluation, Reporting and Analysis Division. 2015. *FHA Production Report, August 2015.*

US Department of Housing and Urban Development, Office of the Assistant Secretary for Housing—Federal Housing Commissioner. 2017. "Federal Housing Administration: Strengthening the Home Equity Conversion Mortgage Program," 82 Fed. Reg. 7094 (Jan. 19).

US Government Accountability Office (GAO). 2012. *Medicaid Long-Term Care: Information Obtained by States about Applicants' Assets Varies and May Be Insufficient*, July 2012, GAO-12-749. Washington, DC: GAO.

———. 2015. *Retirement Security: Most Households Approaching Retirement Have Low Savings*, May, GAO-15-419. Washington, DC: GAO.

Warshawsky, Mark J. 2015. "The Retirement Crisis Controversy." *Tax Notes,* May 11, 10–13.

———. 2017. "Comparing the Use of Reverse Mortgages and Immediate Annuities to Enhance Lifetime Retirement Security." *Journal of Financial Planning* 30 (2): 52–60.

Warshawsky, Mark J., and Tatevik Zohrabyan. 2016. "Retire on the House: The Use of Reverse Mortgages to Enhance Retirement Security; Literature Review, Current Market Terms, Empirical Analysis and Simulations, International Comparisons, and Public Policy Ideas." Working paper, MIT Golub Center on Finance and Policy, Cambridge, MA.