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Analyzing an elder's desire for a reverse mortgage using an economic model that considers house bequest motivation, random death time and stochastic house price

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ABSTRACT

In recent decades, the aging of the population and the lengthening of life expectancy have caused seniors to need more retirement income over a longer time period. Because the reverse mortgage (RM) can fulfill this requirement, it has become increasingly popular among elderly homeowners. Based on the assumption that seniors seek maximum utility, this article presents a theoretical economic model that derives a decision rule for participating in the RM program. The model takes account of the influences of bequest motivation, random death times and stochastic house prices. A critical value for the intensity of house bequest motivation is also derived from our formula for the decision rule. We then use this value to show how the elder's desire to participate in the RM program is influenced by three sets of factors: the elder's personal characteristics and circumstances, the content of the RM contract, and the current economic situation. Elders' desire to participate in the RM program is found to be negatively correlated with the fixed cost of applying for an RM, the RM contract rate, and the cash income from the elder's retirement plan; on the contrary, the desire to participate is positively correlated with the RM principle limit factors, the elder's age at the time of joining the RM program, the elder's time preference, the elder's initial cash wealth, the elder's initial house price, the current interest rate, and the volatility of the house return. These analyses should help RM policy executors and providers understand the RM borrower's decision-making process and how the factors mentioned above influence an elder's desire to apply for an RM.

1. Introduction

Because of advances in medical technology and the decreasing birth rate, the world's dependency ratio[1] has been gradually growing, and it is expected to keep growing for the foreseeable future. For example, the average OECD (Organization for Economic Co-operation and Development) dependency ratio, which was 20.9% in 2000, is forecasted to increase to 37% by 2030 (Mitchell & Piggott, 2004). According to statistics from the U.S. Census Bureau, 38.7 million Americans were 65 years old or above in 2008,

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[1] This refers to the population aged 65 + as a proportion of the working-age population.

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and this number is expected to increase to 72.1 million by 2030.[2] The demographic situation is especially painful in Italy, France, Germany and Japan, where the dependency ratios are projected to exceed 45% in less than 30 years (Disney & Johnson, 2001). The above-mentioned data tell us that aging of the population and longer life expectancies induce demands for greater and longer-lasting retirement income in present-generation seniors than was the case with previous generations.

During retirement, a house is usually one of an elder's major assets. Data from the 2007 Survey of Consumer Finances suggest that housing wealth represented at least 80% of total wealth for 6.5 million homeowners aged 62 or above in the United States.[3] Many elders must transform the equity in their home into funds needed to cover general living expenses, debt repayments, health care and medical treatment. However, it is well known that most seniors would prefer to "age in place" in their own home (Venti & Wise, 2000; Bayer & Harper, 2000).[4] For many of these homeowners, particularly those who are house-rich but cash-poor,[5] the reverse mortgage (RM) should be a suitable tool, because it allows them to convert their house equity into cash through a lump-sum disbursement or a series of payments from a lender without having to sell or move out of the house.

The rapid aging of the population will surely increase the demand for RMs in the coming years. In countries as diverse as Japan, Korea, the USA, Canada, the UK, Australia and France, a variety of RMs have been introduced over the past two decades. According to reports from the National Reverse Mortgage Lenders Association, 54,676 Home Equity Conversion Mortgage (HECM) loans were initiated in 2012, representing an increase of nearly 44.5% since 2004.[6]

Most discussions of the demand for RMs have been rooted in the life-cycle model of consumption and saving, which predicts that people will accumulate assets during their working life and then exhaust these assets during retirement (Venti & Wise, 1990; Merrill, Finkel, & Kutty, 1994; Mayer & Simons, 1994a; Rasmussen, Megbolugbe, & Morgan, 1997). Several studies have found that RM markets in countries such as the United States, Canada, Japan and Australia continue to grow because RMs can be a good way to finance elders' consumption. RMs also alleviate the financial stress that governments face because of their country's aging population (Mitchell & Piggott, 2004; Venkataraman & Vaidyanathan, 2007).

RMs have several advantages. First, they allow borrowers to continue living in their own home for as long as they can, which, as noted above, most of them want to do. Second, RMs can give older homeowners the funds they need to pay for living expenses and medical treatment. Numerous studies have demonstrated that RMs help elders improve their financial situation and significantly reduce the number of them in poverty (Speare, 1992; Mayer & Simons, 1994b; Morgan, Megbolugbe, & Rasmussen, 1996; Bronfenbrenner Life Course Center, 1996; Morgan et al., 1996; Venti & Wise, 2000). Third, the homeowners are not required to make periodic principal or interest repayments as long as they stay in their home. The loan repayments are capped at an amount equal to the proceeds from the sale of the property, the so-called non-recourse provision. Finally, RM borrowers have the option to terminate the RM contract early, a decision which can be to their benefit. Specifically, if the value of the house appreciates greatly, borrowers can terminate the contract by selling the house, thereby reducing their interest expenses and obtaining their capital gains early.

Although RMs have been available for more than several dozen years, and despite their clear advantages, not all elders desire to participate in RM programs. A number of possible factors can be cited that prevent RMs from becoming more popular among elderly homeowners. To summarize the research findings, these factors are (1) an entrenched culture of inheritance and (2) uncertainty about future consumption needs (e.g., medical expenses, long-term care) caused by not knowing how long one will live (Venti & Wise, 1989, 1990; Feinstein & McFadden, 1989; Stahl, 1989; Tse, 1995; Fisher, Johnson, Marchand, Smeeding, & Torrey, 2007). The inheritance culture is probably the more important of the two factors. For example, Mayer and Simons (1994a) note that it is often argued that a bequest motive undermines the demand for RMs because the house is the principal asset passed on to one's heirs; thus, as Tse (1995) points out, joining the RM program means that the house will no longer be an asset that can be given to them. Fisher et al. (2007) also argue that "house bequest motivation" (hereafter denoted as HBM) is one reason that elders may hold on to their home.

In many areas of world, it is common for parents to have HBM because they want their descendants to have a good quality of life. However, the fact that RM lenders eventually recover the accruing RM balance by selling the borrower's house may motivate elders not to join the RM program despite its advantages. There are other downsides to RMs for borrowers. Although the utility of their consumption might increase because the cash they need for living expenses increases, the utility of their HBM might decrease because the borrowed amounts, which accumulate with interest, must be repaid by selling the house at the RM's due date.

In short, the decision that seniors face about whether to participate in the RM program is more complicated than it might appear on the surface. Their decision process involves many factors, such as (1) uncertainty about their time of death, (2) the intensity of their HBM, (3) the increasing cash income from their RM, and (4) the stochastic price of their house. So far, few studies have considered all these factors together in investigating the RM borrower's decision-making behavior. The main purpose of the present article is to use an elaborate economic model to provide information about the decision rule that elder's apply when considering whether to take part in the RM program and the factors that influence an elder's desire to apply for an RM.

[2] U.S. Census Bureau, 2008. Projections of the population of participating age groups in the United States from 2008 to 2050. Available at: http://www.census.gov/population/ www/projections/tablesandcharts.html.

[3] Board of Governors of the Federal Reserve System. Available at: http://www.federalreserve.gov/econresdata/scf/scf_2007.htm.

[4] Here we focus on the elders who have lived in the house for a long time. If someone has only lived in their home for a brief period, they may not be as attached to it as they would if they had spent a very long time in it.

[5] Using data from the English Longitudinal Study of Aging 2002–2003, Sodha (2005) estimates that 10.2% of the retired population in Britain had an income below the "modest but adequate" standard of £157 per week before housing costs, but their housing wealth exceeded £100,000.

[6] The data were obtained from the HUD's FHA HECM Characteristics Report.