# Demand for Home Pension and Reverse Mortgage: An Information Provision Survey Experiment<sup>\*</sup>

Duk Gyoo Kim<sup>†</sup> In Do Hwang<sup>‡</sup>

June 8, 2025

#### Abstract

Elderly poverty is a distinctive issue associated with the population structure changes in South Korea, one of the fastest aging countries. Recent studies estimate that the elderly poverty rate would substantially decrease if they collateralize illiquid assets by adopting the existing schemes such as home pension. Somewhat strikingly, the enrollment rate of the home pension among the eligible elderly is less than 2%. We conduct an information provision survey experiment to examine how additional features or the change of the stereotypical beliefs about the home pension would affect their intention to demand it. We found that the intention of enrollment increases by 6%p if the home pension scheme is reformed to periodically redetermine the monthly pension payment based on the changes of the house price and by 5%p if it is reformed so that the remaining house value can be bequeathed to their children more easily. A more interesting finding is that merely informing that the fixed monthly payments, which do not adjust to later rises in house prices, do not result in a loss when house prices rise-because the amount bequeathed to their children increases accordingly-led to a 7%p increase in enrollment intention. Our findings suggest that reconciling some of the concerns about the uptake of the home pension is as effective as the policy reforms that could have been considered most effective.

#### JEL Classification: D14, C93, H55

Keywords: Home Pension, Reverse Mortgage, Survey Experiment

<sup>\*</sup>We would like to thank Kyeongtae Lee, Seunghee Lee, and seminar participants at the Bank of Korea and Sungkyunkwan University for their helpful comments. We also thank Woo Seok Kim for his valuable assistance and suggestions. The authors received the IRB approval from Sungkyunkwan University (No. 2024-07-075). The views expressed herein are those of the authors, and do not necessarily reflect the official views of the Bank of Korea. When reporting or citing this paper, the authors' names should always be explicitly stated.

<sup>&</sup>lt;sup>†</sup>School of Economics, Yonsei University. Email: kim.dukgyoo@gmail.com

<sup>&</sup>lt;sup>‡</sup>Economic Research Institute, Bank of Korea. Email: hid@bok.or.kr ORCID 0000-0002-0799-762X

### **1** Introduction

South Korea is one of the fastest aging countries in the world. This country became a socalled super-aged society in December 2024, whereby the proportion of people aged over 65 will reach 20% of the total population. By 2050, this proportion of the elderly population is anticipated to be more than double.<sup>1</sup> Among several issues associated with the changes in the population structure, elderly poverty is distinctive. According to the OECD report,<sup>2</sup> the income poverty rate of older people (aged over 65) ranks South Korea first out of all OECD countries at 40.4%. A noticeable point of elderly poverty in South Korea is that many elderly who suffer from the lack of flow income possess an illiquid asset; a residential house. Recent studies (Choi et al., 2023b; Lee, 2023) estimate that the elderly poverty rate would decrease by 13%p to 16%p if they liquidate their assets by adopting the existing schemes such as home pension, farmland pension, and reverse mortgages.<sup>3</sup> Since these studies claim that elderly poverty can be resolved to a large extent if the elderly liquidate their assets, the problem seems easy to tackle: allowing them to liquidate their wealth via home pension. Somewhat strikingly, the application rate of the home pension among the eligible elderly was 1.16% in 2022. Although two major commercial banks provide a reverse mortgage plan, almost no one uses it. The primary goal of this paper is to investigate why the uptake of home pension is so low, compared to what the "wealthy hand-to-mouth" (Kaplan et al., 2014) are supposed to demand.

What would facilitate elderly demand for liquidizing their homes more? Should some features of the home pension scheme be improved? Should the elderly be more positively informed about the home pension, that is, should the government agency (Korea Housing Finance Corporation) advertise the positive aspects of the home pension to the eligible elderly more? Or, should the reverse mortgage plans offered by commercial financial institutions such as banks and insurance companies be promoted more?

To answer these questions, we design an information provision survey experiment (Haaland et al., 2023), providing a different set of information to survey participants and examining the difference (the treatment effect) among their responses. We believe this information

<sup>&</sup>lt;sup>1</sup>Aging population in South Korea - statistics & facts. Last access: Oct 24, 2024

<sup>&</sup>lt;sup>2</sup>OECD Income Distribution Database, Last access: Oct 24, 2024

 $<sup>^{3}</sup>$ A reverse mortgage is a loan that provides the opposite cash flows to the mortgages: receiving a monthly payment (income) while living in the house, and the loan and interest are repaid only when the loaner sells their home, permanently moves away, or dies. Considering that reverse mortgages are offered by commercial financial institutions, we call a similar product offered by a government enterprise a home pension. See Section 3 to check the differences in more detail.

provision survey is appropriate, especially when there have been no policy changes to observe changes in enrollment as a response to the policy changes. Since the reform plan for the home pension has not been finalized, various virtual conditions can be presented to survey participants, without raising a concern about the different information processing due to the participants' prior beliefs about the home pension reforms.

We conduct the survey experiment in the following way: A total of 3,820 participants were recruited as a representative sample of South Korean adults aged 55-79 who own a residential property and have not enrolled in the home pension scheme, selected using proportional stratified sampling stratified by gender, age, residential area (16 regions), and type of property owned (apartments vs. others). All participants first answer whether they are aware of the home pension scheme and how much they are interested in signing up for the home pension. After that, they are randomly divided into four groups, and each group is presented with information about the home pension, either in the form of the amendment or in the form of re-appreciation of the current home pension. The changes in the intention to sign up due to the information provision will be compared by treatments so that we can estimate the treatment effects. The details follow in Section 4.

As found in the previous studies, the major reasons for not enrolling in the home pension were (1) the concern about being paid less than the home value, (2) the constant (inflationadjusted) payment that does not reflect on the, mostly positive, changes in the housing price, and (3) the possible difficulty of inheriting the house to their children. We found that the intention of enrollment increased by 6%p when the home pension scheme is reformed to periodically redetermine the monthly payment based on the changes of the housing price, and by 5%p when it is reformed so that the remaining housing value can be bequeathed to their children more easily. A more interesting finding is that merely informing participants that the two major concerns (the constant pension payment not responding to later changes in housing prices and the issue of bequeathing the remaining housing value) contrast with each other also increased the intention to enroll by 7%p. That is, when informed that the fixed monthly payments, which do not adjust to later rises in house prices, do not result in a loss when house prices rise—because the amount bequeathed to their children increases accordingly—participants showed the most significant changes. Our findings suggest that reconciling some of the concerns about the uptake of the home pension is as effective as the policy reforms that could be considered most effective.

Furthermore, we find that although people in general prefer the home pension provided by the government enterprise over the reverse mortgage provided by commercial banks, the preference change is significant if the reverse mortgages are designed in more attractive ways. Thus, we envision a potential for burgeoning private markets for the liquidation of residential houses.

This paper is related to the literature on behavioral impediments of uptake of welfare enhancing reverse mortgages (Davidoff et al., 2017; Hanewald et al., 2020; Han et al., 2024; Han and Zhang, 2024; Fong et al., 2023) and annuities (Brown et al., 2008, 2021). To our knowledge, this paper is the first to conduct an information provision experiment (Haaland et al., 2023) with a randomized controlled trial setup on the uptake of reverse mortgages. From a methodological perspective, the most closely related study is Han and Zhang (2024), which investigates the likelihood of changing the "demand willingness" for house reverse mortgages through an information provision experiment. Unlike Han and Zhang (2024), which focuses on "within variation" with a small sample size (n=342) from China, this study utilizes a large sample of Koreans (n=3,820) divided into four groups, employing a randomized controlled trial design. This design allows for the examination of both "between variation" and "within variation," providing a more robust framework for causal inference. This study thereby provides firm causal evidence that information provision addressing loss framing can have a similar or greater impact than offering differently designed reverse mortgage options. Furthermore, the incorporation of a placebo treatment to detect experimenter demand effects adds a unique dimension to the study's methodology.

The remainder of the paper is organized as follows. After a brief introduction of the home pension and the reverse mortgage considered in South Korea in Section 3, Section 4 describes how we designed the experimental survey and how we conducted it. Section 5 presents the survey results and estimates the average treatment effects on demand for home pension. Section 6 concludes.

### 2 Literature

This study contributes to the literature on behavioral impediments of adopting welfareenhancing reverse mortgages and annuities. Davidoff et al. (2017) provide evidence that the low uptake of reverse mortgage plans might be due to the limited understanding about the products. Our finding that changing perceptions regarding the home pension is as effective as direct policy changes is consistent with the findings of Brown et al. (2008), which provide evidence that survey respondents' preferences are reversed when the same annuity plan is introduced in the consumption frame and in the investment frame. Brown et al. (2021) find that the complexity of the annuity choice reduces respondents' ability to value the annuity, and narrow choice bracketing can help their ability to value an annuity.

The literature on the take-up of insurance is also closely related to this paper, because Korea's home pension provides lifelong "annuity insurance" through the scheme of housing reverse mortgage. Hwang (2021) and Hwang (2024) find that loss-averse individuals show significantly lower ownership rates of insurance products, indicating that consumers may perceive insurance as a risky financial product that could result in a loss. Consequently, loss-averse consumers tend to be reluctant to purchase insurance. Our findings reveal that elderly Koreans with strong loss aversion are hesitant to adopt home pensions as well, suggesting that many view these pensions as uncertain financial instruments potentially leading to losses.

Ha et al. (2019) demonstrate that providing highly relevant and more accurate information about retirement pensions can alter the investment behavior of Korean consumers. This finding is consistent with the strong treatment effects observed in Group 4 of this study, where accurate information about products was provided. In particular, Group 4 showed significant effects when the loss frame was corrected through information provision. This finding is consistent with Kwon et al. (2021), which demonstrated that the choices of many households in Korea are influenced by framing effects. The finding from Group 3, which shows that the intention to enroll increases when inheritance of home pensions is made easier, aligns with the results of Nakajima and Telyukova (2017), which demonstrated that bequest motives have a significantly negative impact on the adoption of reverse mortgages in the United States.

This paper contributes to the literature on Korea's home pension system (Choi et al., 2023a, 2020) by presenting the first information provision experiment focused on this topic. It provides rigorous quantitative evidence on the potential increase in uptake under real-world conditions. In doing so, it offers crucial insights into how reforms to the Korean home pension system can enhance elderly income and addresses the pressing issue of severe elderly poverty in Korea (Hwang et al., 2023; Choi et al., 2022).

### **3 Background: Home pension and reverse mortgages**

This section serves as a brief introduction to two specific forms of house loans: the home pension and the reverse mortgage. The denominations might be different by country, so we focus on the two long-term payment schemes associated with the value of a residential

|                   | Home Pension                              | Reverse Mortgage                                  |  |  |
|-------------------|---|---|--|--|
| Eligibility       | Aged over 55<br>House value* ≤ 1,200M KRW | Aged over 40<br>no restrictions                   |  |  |
| Maturity          | When both spouses die                     | up to 30 years                                    |  |  |
| Payment stability | Guaranteed by the government              | Stopped when the bank<br>goes bankruptcy          |  |  |
| Recourse          | No recourse                               | When the sum of payments exceeds the market value |  |  |

house, offered in South Korea. Both share a common feature of generating an income flow to the homeowner by liquidating the residential house, but their operations somewhat differ.

\*Official land value appraised by the government. The official value of 1,200M KRW is priced around 1,700M KRW in the market.

Table 1: Comparison between the home pension and reverse mortgage

A reverse mortgage is a loan provided by commercial financial institutions. As the name suggests, the reverse mortgage generates income flows in the opposite direction of a typical mortgage. By collateralizing the house, the borrower receives monthly loan payments from a bank over a contract period (up to 30 years), and the repayment is made at the end of the contract. Either when the lender declares bankruptcy or when the sum of payments exceeds the market value of the house, the payments are stopped during the contract period.

A home pension can be regarded as a government-backed reverse mortgage for life. Even if the sum of the pension payments exceeds the market value of the house, the Korea Housing-Finance Corporation (KHFC) continues to pay the pensioner until both spouses die. This lifetime annuity effectively functions as insurance against longevity risk—the risk of living too long. Since the home pension has such a feature of social insurance, only those who possess a house with a value less than 1.2 billion KRW in terms of the official land value, or less than 1.7 billion KRW in market value, are eligible to enroll in the home pension. A reverse mortgage doesn't have such an upper limit of the value of an eligible house.

According to KHFC's data as of September 2024,<sup>4</sup> the average home pensioner is 72 years old and receives a monthly pension payment of 1.22 million KRW (about 870 USD), living in a house worth 388 million KRW.

There are several subtle issues worth mentioning about the home pension and reverse mortgages, especially regarding the payment schemes and the bequest taxes. KHFC also provides other types of home pensions, for example, paying a larger amount for the first five

<sup>&</sup>lt;sup>4</sup>Source: Korea Housing-Finance Corporation webpage. Last access: December 5, 2024

years of enrollment or after some years of enrollment. Obtaining a reverse mortgage loan or a home pension payment lowers the remaining value of the house that children wish to inherit, effectively reducing the inheritance tax. Addressing these subtle issues are beyond of the scope of this study.

### 4 Experimental Design

Our primary research questions are (1) whether changes of the current home pension scheme would facilitate demand for it, (2) whether demand for the home pension would increase if information pointing out that the two major reasons for reluctance to the home pension may counteract each other is presented, and (3) whether reverse mortgage plans offered by commercial financial institutions could be more effectively promoted. To address these questions, we designed an information provision survey experiment that provides different sets of information about the home pension to survey participants. This approach allows us to examine the difference (the treatment effect) driven by the information provided.<sup>b</sup> We believe an information provision survey is an appropriate method, especially given the lack of policy changes to observe how enrollment might respond to such changes. Since no reform of the home pension has been considered, various hypothetical conditions can be presented to survey participants without being influenced by their prior beliefs. Since some of the survey questions ask respondents' unobservable beliefs and valuations, some may consider advanced methods with strategy-proof monetary incentives, such as a binarized scoring rule (Hossain and Okui, 2013). However, we decided against using complicated incentive-compatible payment methods because the elicitation of beliefs might not be behaviorally incentive compatible (Danz et al., 2022).<sup>6</sup>

The survey experiment was conducted as follows: All participants (aged 55 or older, owning a residential house, and not enrolled in the home pension scheme<sup>7</sup>) were initially in-

<sup>&</sup>lt;sup>5</sup>See Appendix for the complete survey questions in Korean. The survey questions translated into English are available upon request.

<sup>&</sup>lt;sup>6</sup>Two additional reasons guided our decision not to use incentive-compatible payment methods. First, given our budget constraints, the scale of payments under incentive-compatible methods would have been drastically smaller. While this might work in a laboratory setting, it seems irrelevant to the context of the home pension information we provide during the survey. Second, many questions ask for personal beliefs or private information, making it challenging to determine which questions should be incentivized. Given the respondents' ages (55 or older), we believe that adopting strategy-proof incentive schemes for many questions would be unproductive.

<sup>&</sup>lt;sup>7</sup>Although including participants who are not eligible for the home pension but qualify for reverse mortgages could be insightful, we excluded participants under 55 because our primary focus is on why the most eligible elderly have not enrolled. We also exclude participants already enrolled in the home pension for two

formed about the home pension (See Figure 1) in section A of the survey. This section assesses their awareness and intention to enroll in the home pension.



Figure 1: Commonly provided information (translated in English)

In section B, participants were randomly divided into four groups, each presented with information about the home pension, either as potential amendments or reinterpretations of the current scheme. All treatment arms are summarized in Table 2. Participants were then asked again their intention to enroll in the home pension after receiving the information.

The G1 (Placebo) group was informed about a negligible change: See Figure 2. The participants were told that under the current home pension, an enrollment fee of 1.5% of the

reasons: First, including them would require tailoring the first set of survey questions, complicating comparisons. Second, since only a small fraction (1.16% in 2022) of eligible elderly have enrolled, excluding them does not significantly affect the sample's representativeness.

| Group | o Treatment          | Information provided                                      |
|-------|----------------------|---|
| G1    | Placebo              | A negligible partial refund of the initial enrollment fee |
| G2    | Varying Payments     | Pension payments varying with the house value changes     |
| G3    | Easing Bequests      | Longer repayment periods for the house being bequeathed   |
| G4    | Changing Perceptions | Benefits of stable pension payments                       |

Table 2: Experimental Design

home value is due on the first day of receiving pension payments. Under the hypothetical new scheme,<sup>8</sup> a small amount (10,000 KRW) would be refunded from the enrollment fee. Considering the average home value of 386 million KRW and an average enrollment fee of approximately 5,790,000 KRW, this refund is negligible.



Figure 2: Information provided to G1 (translated in English)

G1 serves as the control group, instead of introducing a separate treatment arm without providing additional information, to account for potential experimenter demand effects—participants' tendency to respond to perceived implicit demands. By structuring the survey to elicit intentions before and after providing seemingly favorable information, changes in

 $<sup>^{8}</sup>$ We emphasized the suggested changes introduced during the survey might not be implemented.

responses could arise from perceived demand rather than actual treatment effects. Although the experimenter demand effects were not severe in the laboratory (de Quidt et al., 2018), we want to ensure that the changes in their reported intention are not driven by the mere fact that we have provided something in the middle. The monetary benefit suggested in G1 is negligible, so would be the changes in intention to enrollment. Making the survey structure and length identical to the treatment conditions is another benefit of the placebo treatment.

To further reduce experimenter demand effects, we carefully worded the information to avoid framing it as inherently positive. For example, we avoided calling the new schemes in G1–G3 "improvements." Instead, we explicitly stated, "the new home pension discussed in this survey might be better, worse, or indifferent compared to the current home pension."

The G2 (Varying Payments) group was informed about potential changes to monthly payments in later years: See Figure 3. Participants were told that the current home pension pays fixed monthly amounts regardless of changes in the market value of the collateralized house. If some regard the home pension enrollment as an investment, they may mistakenly believe that delaying enrollment until house prices peak maximizes income streams. This belief, influenced by sharp historical increases in South Korean house prices, is a significant behavioral impediment to enrollment, as noted by previous surveys conducted by KHFC.<sup>9</sup>

However, Waiting for higher monthly payments may not align with the home pension's purpose of providing stable income for asset-rich, income-poor elderly. Beneficiaries gain from stable income streams now rather than enduring current financial struggles while speculating on future house prices. Even if house prices increase significantly, they could still profit by selling the house and terminating the pension without penalties. This concern about higher payments contrasts with another major reluctance regarding home pensions: bequest motives.

According to the previous survey conducted by KHFC, the eligible elderly citizens' second most common reason for not enrolling is that bequeathing a collateralized house seems difficult.<sup>10</sup> G3 (Easing Bequests) treatment addresses this concern: The G3 group is informed that the process of getting bequeathed is easier under the new home pension: See Figure 4. Participants were told that under the new scheme, the repayment period for inheritors would be extended from six months to three years, with more accessible loans for repayment.

<sup>&</sup>lt;sup>9</sup>Our survey differs from KHFC's annual surveys by focusing on the effects of information provision, rather than describing current conditions.

<sup>&</sup>lt;sup>10</sup>A recent study (De Nardi et al., 2025) also shows that bequest motives are a key determinant of aggregate retirement wealth.



Figure 3: Information provided to G2 (translated in English)

Note that the two information treatment conditions in G2 and G3 address somewhat contrasting concerns about not taking the home pension. Suppose that an eligible elderly citizen changes her intention to enroll in the home pension in G2 and G3. It means that she wants to receive (possibly increasing) pension payments that reflect the (possibly increasing) house price, and at the same time, she is concerned about her children's repayment, which will be larger when her monthly payments are associated with the increased house price. In G4 (Changing Perceptions) treatment, the survey participants were informed that the two main concerns may seem to counteract each other, without suggesting an change in the home pension scheme: See Figure 5.

G4 group is told that the perception about the stable monthly payment that does not reflect ex-post changes in house price may not necessarily be negative. Stable monthly payments help the pensioner to appreciate smoothed consumption for life, which is the essentially desirable feature of the lifetime utility maximization given that the upper contour set of preference relations is convex. Also, it reiterates a simple point that getting stable monthly payments when the house price increases means that the remaining value of the house, which will be bequeathed, increases. Even if the children want to inherit the house, the sum of their parents' pension payments compared to the value of the house is less bur-



Figure 4: Information provided to G3 (translated in English)



Figure 5: Information provided to G4 (translated in English)

densome. Note that the 'information' provided in G4 is not an introduction of a new feature, but a reiteration of what they can rationally infer.

Two upfront sections A (the intention to enroll in the current home pension) and B (the intention to enroll after being informed) are of our main interest. Sections C to H of the survey collected respondent characteristics for control variables. Section C asked how they prospect the housing prices in 20 years and how long they anticipate to live in a healthy shape. In section D, we introduced the reverse mortgage plans that are currently provided by commercial banks and asked whether they are aware of these plans and whether they would prefer the reverse mortgage over the home pension. We also asked their general tendency of appreciating services and products provided by the government versus the private sector. Section E assessed the respondent's risk and time preferences, by adopting similar questions from World Values Survey and Gächter et al. (2022), and their time inconsistency and willingness to pay for insurances. Sections F and G included demographic and economic status questions. Section H measured financial literacy using OECD international survey items.

#### 4.1 Experimental Procedure

The survey was conducted by Hankook Research, a professional survey agency, using a nationally representative sample of 3,820 participants, from August 26 to October 2, 2024.<sup>11</sup> Upon completing the survey, online respondents received the participation fee of 1,500 KRW (about 1.06 USD as of December 5, 2024) and in-person respondents received a small gift whose value is greater than 1,500 KRW. Since the standard web-based survey may lose its representativeness for the elderly, especially for those aged 70 or over, the agency collected the responses in person: the trained survey agents asked survey questions to the participants aged 70 or over and recorded their answers on-site.

Table A.1 shows that our samples are representative of the South Korean population aged 55 or over. Since the survey participants were randomly assigned to one of the four treatment conditions with an equal probability, the sample characteristics of each treatment group should share those of the population distribution.  $\chi^2$  homogeneity test results of some un-targeted variables (Table A.2) show that there are no significant differences among

<sup>&</sup>lt;sup>11</sup>We also had pilot data from 205 respondents. The pilot survey was conducted online in June 2024. Whether to merge the pilot data does not change the results in any qualitatively meaningful ways, but we decided to exclude the pilot data for two reasons. First, the pilot data was collected online, so the responses from those aged 70 or over would be more deviating from the representative sample responses. Second, we changed the wording and images used in the survey slightly.

groups, implying that survey samples are randomly split into the four treatment groups as designed.

### **5** Results

#### 5.1 Treatment Effects on Demand for Home Pension

Since each survey respondent reports their intentions to enroll in the home pension both before and after the information provision, we use the individual change in intention to enroll as a key dependent variable to test how each treatment arm affects changes in intention. Because we randomly assigned the survey participants to four treatment conditions, other control variables capturing individual characteristics are, at least by design, orthogonal to the treatment condition.<sup>12</sup> Table 3 presents the main results without controlling for other explanatory variables.

|  | Ν                        | Positive Response (%)<br>Before Informed After Informed |                                  | $\Delta$ ( <i>p</i> -value)                                      | Between group   |
|--|--------------------------|---|----------------------------------|--|---|
| Total  | 3,820                    | 35.29   | 40.21                            | +4.92 (0.000)  | -   |
| G1 (Placebo)<br>G2 (Varying Payments)<br>G3 (Easing Bequests)<br>G4 (Changing Perceptions) | 946<br>967<br>956<br>951 | 35.86<br>33.02<br>36.69<br>35.61                        | 36.60<br>39.23<br>41.93<br>43.07 | +0.74 (0.419)<br>+6.21 (0.000)<br>+5.24 (0.000)<br>+7.46 (0.000) | base<br>+5.47 (0.000)<br>+4.53 (0.001)<br>+6.72 (0.000) |

Table 3: Changes in the intention to enroll, by treatment

Notes: The respondents answered their intention to enroll in the home pension in a five-point Likert scale. Positive response is defined as fraction of the responses indicating "likely to enroll" and "surely likely to enroll" combined.

As expected, the intention changes in G1 were the smallest, with a 0.74 percentage point change that is statistically insignificant  $(p = 0.419)^{13}$ . The treatment effects for G2–G4 are statistically significant at the 1% level of significance, and those are significantly larger than the treatment effect for G1 at the same level of significance, as indicated in the last column of Table 3. Table 3. Specifically, the intention to enroll increases by 6.21 percentage points if the home pension scheme is reformed to periodically redetermine the monthly pension

<sup>&</sup>lt;sup>12</sup>In a similar vein, inaccurate responses—such as overstatement or understatement of their willingness to enroll in the pension—do not bias the treatment effect estimates as long as such noise is not systematically related to the treatment conditions. However, inaccurate responses may reduce the statistical significance of the estimates by increasing their standard errors. Accordingly, we report statistical results in a conservative manner.

<sup>&</sup>lt;sup>13</sup>Unless otherwise stated, we report the p-value of the two-sided test about the null hypothesis of zero estimated coefficients. Table 3, for example, report the two-sided *t* test results of zero differences in mean.

payment based on changes in house prices and by 5.24 percentage points if it is reformed so that the remaining house value can be bequeathed to children in a less burdensome way. A more interesting finding may be that merely informing that the two major concerns for the home pension are contrasting each other also increases the intention to enroll by 7.46 percentage points. Although the treatment effect in G4 is not statically different to those in G2 and G3, but the proportion of the changes in intention is indeed the largest in G4 among all the treatments. Our findings suggest that reconciling some of the concerns about the uptake of the home pension are as effective as the direct policy reforms that have been considered most effective.

A particularly interesting finding is that merely informing participants that the two major concerns regarding the home pension are contrasting each other also increases the intention to enroll by 7.46 percentage points. Although the treatment effect in G4 is not statistically different from those in G2 and G3, the proportion of the change in intention is the largest in G4 among all the treatments. These findings suggest that reconciling some of the concerns about the uptake of the home pension can be as effective as the direct policy reforms that have been considered most effective.

This finding does not appear to be driven by eligible elderly respondents being unaware of the home pension and discovering it for the first time during the survey. In fact, 96% of respondents reported that they were already familiar with the home pension before it was introduced in the survey. Additionally, the responses align with their self-reported reasons for why people are reluctant to enroll in the home pension. Figure 6 summarizes the top reasons respondents believe people are hesitant to enroll in the home pension..<sup>14</sup>

Consistent with previous findings from the survey conducted by the KHFC, the survey participants identified the following as the most crucial reasons for reluctance to enroll in the home pension: (1) pension payments are too small compared to the (potentially increasing) future house value, (2) a desire for children to inherit the home without dealing with the clearance of collateralization, and (3) concerns about stable payments when house prices rise. Considering that reasons (1) and (3) both stem from the lack of responsiveness to house price changes, the main reluctance arises from dissatisfaction with stable pension payments and concerns about bequests. G2 and G3 effectively address these concerns. Result 1 summarizes the first findings.

#### **Result 1.** The intention to enroll in the home pension increases by 6 percentage points if the

<sup>&</sup>lt;sup>14</sup>The exact survey question was, "Researchers consider the following (randomly ordered) list as potential reasons why people are reluctant to enroll in the home pension. Please indicate the most crucial reasons, up to three." Combining the top three reasons does not lead to meaningful analytical changes.



Figure 6: Reasons about the reluctance of the home pension

home pension is reformed to periodically redetermine the monthly pension payment based on house market prices and by 5 percentage points if it is reformed enable easier bequeathal of the remaining house value to children. Additionally, emphasizing the benefits of stable pension payments increases the intention to enroll by 7 percentage points.

#### 5.2 Treatment Effects on Demand for Reverse Mortgage

Next, we examine whether similar products offered by private lenders, such as banks and insurance companies, can serve as suitable substitutes for the home pension. This question is of interest because the current market for collateralized retirement plans in Korea is predominantly concentrated in the public sector.

In section D, we introduced the reverse mortgage (Figure 7) and asked whether the survey participants were aware of it. We then inquired which they would prefer—the home pension or the reverse mortgage—if the terms and conditions of the reverse mortgage were identical to those of the current home pension.

After that, we asked participants to choose between the current home pension and a reverse mortgage with additional features corresponding to the treatment conditions. Specifically, in G1, participants were asked to choose between the current home pension and a reverse mortgage with a small refund of the initial enrollment fee. In G2 (G3), they were asked to choose between the current home pension and a reverse mortgage whose monthly payments reflect house price changes (a reverse mortgage with an easier repayment process



Figure 7: Provided information about the Reverse Mortgage (translated in English)

and simplified access to new loans for repayment). In G4, since no new information about the home pension was provided, we reminded participants of one feature of the reverse mortgage: there is no upper limit on house price for eligibility.

It turns out that respondents were less familiar with the reverse mortgage. While 96% stated that they had heard about the home pension before it was introduced in the survey, only 54% reported that they had heard about the reverse mortgage. Given identical conditions, the majority (67%) of respondents indicated a preference for the home pension over the reverse mortgage, while only 4% preferred the reverse mortgage over the home pension. Among those who preferred the home pension, 63% chose 'trust in government agencies' as the primary reason for their preference, which aligns with the fact that the current market for collateralized retirement plans is exclusively concentrated in the public sector.

However, we find some evidence suggesting that the private sector could play a role. When the current home pension is compared to the reverse mortgage with the treatment condition, preferences for the reverse mortgage significantly increase under all treatments (See Table 4). Notably, in G2 and G3, preference for the reverse mortgage with the treatment condition increases by 14 percentage points. Although the changes in preference for the reverse mortgage in G1 and G4 are smaller, they remain significantly positive, implying that people may respond to positive incentives, no matter how minor. The treatment effects in G2 and G3 are significantly larger than that of G1 at the 1% level of significance, while

|    | Prefer Mortg   |                         |                    |
|----|----------------|-------------------------|--------------------|
|    | Under the      | Reverse mortgage with   | $\Delta(p$ -value) |
|    | same condition | the treatment condition |                    |
| G1 | 4.75           | 9.70                    | 4.96 (0.000)       |
| G2 | 4.76           | 18.84                   | 14.08 (0.000)      |
| G3 | 3.25           | 17.19                   | 13.94 (0.000)      |
| G4 | 3.68           | 9.14                    | 5.46 (0.000)       |

the treatment effect in G4 is not statistically different (p=0.716).

Table 4: Changes in preferences for the reverse mortgage

The survey participants selected the features they would most like to see added to reverse mortgage loans. Figure 8 summarizes the features they found most favorable. Extending the loan contract for life essentially makes the reverse mortgage identical to the home pension, reflecting the majority response of preferring the home pension over the reverse mortgage. The other three most frequently chosen features were incentives related to medical care expenses and taxes, flexible options including emergency withdrawals, and mortgage loans tied to medical care expenses. These findings suggest that reverse mortgages could become more attractive not by merely mimicking the home pension (which is not feasible, as the commercial financial institutions are not obligated to bear the potential loss associated with longevity risk) but by offering diverse service features. Result 2 summarizes these observations.

**Result 2.** While most respondents prefer the home pension over reverse mortgages offered by private lenders, reverse mortgages have potential for growth if they provide competitive advantages such as house price-responsive payments, simplified inheritance processes, and additional incentives.

#### 5.3 Individual Heterogeneities to Treatment Effects

Although we claim that the random assignment to each treatment condition eliminates concerns about sample selection bias by design, this does not mean that we disregard heterogeneous individual characteristics, as these could influence changes in the intention to enroll *within* each treatment condition. To illustrate how individual characteristics may affect the responses to the treatment conditions, Figure 9 presents how survey respondents perceive future house prices at both the national and local levels. While the majority expect house



Figure 8: Desirable improvements of the reverse mortgage

prices to rise over the next 20 years, a non-negligible proportion (24.66% for national prices and 27.09% for local prices) of respondents anticipate that the house prices will decrease. If concerns about the house value depreciation outweigh expectations of the house value appreciation—possibly due to loss aversion—then people may view G2 treatment (varying payments based on the market price of the collateralized house) negatively, as it implies that their payments might decrease. Similarly, the G4 treatment (highlighting the benefits of stable payments) could have an adverse effect by reminding respondents that bequeathed value of the house would diminish. This illustration underscores the importance of examining the effects of individual heterogeneities.



Figure 9: House price expectations in the next 20 years

To examine the effects of individual heterogeneities, we first regress the initial intention to enroll in the home pension on explanatory variables of interest, as follows:

$$y_i^* = \beta_0 + \sum_{k=1}^K \beta_k x_{ik} + \varepsilon_i, \tag{1}$$

where  $y_i^*$  is individual *i*'s underlying initial intention to enroll in the home pension, and  $x_{ik}$  represents *i*'s explanatory variable *k*, which includes individual socioeconomic characteristics such as gender, age, education level, and preparedness for retirement. The explanatory variables also include their expectations about future house prices, life expectancy, risk and time preferences, and financial literacy. Since survey participants' initial intentions were asked before the information treatment, this regression does not include a binary indicator for the treatment group. Given that the observed dependent variable—intention to enroll in the home pension—is a discrete ordinal variable, we adopted ordered logit model. Figure 10 presents the results of our preferred model specification. For each horizontal line, a dot represents a point estimate, and the line indicates the 95% confidence interval. If the line does not intersect with the vertical axis, the point estimate is statistically significant at the 5% significance level. Some additional model specification results are available in Table A.3 in the Appendix. The results align with Figure 10. Additional variables, such as monthly income, income sufficiency, and home value, were not statistically significant.<sup>15</sup>

The results show that their intention to enroll in the home pension is weaker for relatively older respondents; weaker for single-family homeowners (as opposed to the residents of the apartment unit); stronger for the more educated; stronger for the more patient; weaker for the more loss averse; weaker for those who are prepared for retirement; stronger for those who live in greater Seoul area, including Seoul, Incheon, and Gyeonggi-do; and stronger for those who have demand for insurance. These are all aligned with commonsensical narratives. For example, people with a higher education attainment level are more likely to intend to enroll in the home pension as they would appreciate the insurance values of the home pension, and people who intend to bequest their house to children are less likely to intend to enroll. It is worth noting that merely having children does not necessarily imply that they are less likely to enroll in the home pension: Only the parents who intend to bequest their home to children matter. The effects of gender, negative housing price expectations, risk aversion, marital status, and the financial literacy measure are statistically insignificant.

 $<sup>^{15}</sup>$ The descriptive statistics show that the intention to enroll in the current or reformed pension schemes is relatively lower among the low-income group compared to the overall average. For households with a monthly income of less than 2 million KRW (n=696), the intention to enroll in the current pension scheme is 25.1%, lower than the overall average (N=3,820) of 35.3%, and for the reformed pension scheme (G1-G4), it is 27.7%, lower than the overall average of 40.2%. One thing to note is that the low-income group includes many older adults and individuals with lower education levels, who tend to show less responsiveness to the home pension. Therefore, while the descriptive statistics indicate that the low-income group shows less response to the home pension, after controlling for factors such as age and education level (Table A.3), the direct effect of monthly income appears to be small.



Figure 10: Effects of individual characteristics on the intention to enroll

With having in mind such heterogeneous intentions to enroll, we further examine how these heterogeneities influence the treatment effects—the changes in positive intention before and after information provision. We adopted the following regression model:

$$y_{i}^{t} = \beta_{0}^{t} + \sum_{k=1}^{K} \beta_{k}^{t} x_{ik}^{t} + \varepsilon_{i}, \quad \text{for } t \in \{1, 2, 3, 4\},$$
(2)

where  $y_i^t$  is individual *i*'s change in positive intention in treatment *t*, and  $x_{ik}^t$  is *i*'s explanatory variable *k* in treatment *t*. There was a small fraction of respondents (2.7%) whose changes were in the negative direction, so  $y_i^t$  takes values +1, 0, or -1. To visualize<sup>16</sup> the results in a more straightforward manner, we binarized the explanatory variables. For example, instead of ages ranging from 55 to 79, we consider two age categories, aged 69 or under and aged 70 or over. This way, we can examine whether relatively younger participants responded more to the treatment conditions. Similarly, "high education level" is a binary variable indicating a college degree or more; "negative price expectation" indicates whether the respondent expects local house prices to decline in the future; "high risk aversion" indicates those who prefer to surely receive the current salary over to receive 200%

<sup>&</sup>lt;sup>16</sup>Although Figure 11 shows the estimates and confidence intervals in the aggregate, we can present two bar graphs per treatment condition for each control variable so that the heterogeneity in treatment effects can be demonstrated easily. Such figures are available upon request.

or 80% of the current salary with an equal probability; "high patience" indicates those who prefer to receive 17,000 KRW a year later over to receive 10,000 KRW immediately; "high loss aversion" indicates those who prefer not to participate in the gamble gaining 6,000 KRW or losing 3,000 KRW with an equal probability; "prepared for retirement" indicates those who self-report that their preparation for retirement is sufficient; "high financial literacy" indicates those who answered both financial literacy questions correctly; and "demand for insurance" indicates those who prefer to buy an insurance that fully covers a loss of 100 million KRW with a 5% chance for 7 million KRW. Other variables such as "singlefamily home," "female," "married," and "have children" are binary variables to begin with. Figure 11 shows linear<sup>17</sup> regression results with using the subsample of each treatment. Similar to Figure 10, for each horizontal line, four dots represent point estimates in each treatment, and lines present the 95% confidence interval of each estimate. If the line does not intersect the vertical axis, then the point estimate is statistically significant at the 5% significance level.



Figure 11: Effects of individual characteristics to the changes in intention, by treatment

The first observation from Figure 11 ia near zero effect on the G1 (Placebo) treatment, as

 $<sup>^{17}</sup>$ Since the dependent variable is the difference of two binary variables, it has three discrete values, -1, 0, and 1. Although ordered logit model would be more appropriate in this case, we considered linear regression as the interpretation of the estimated coefficients is more intuitive. Results from different specification models are available upon request.

expected. This finding is in line with our claim that the treatment effects we have observed are not due to the experimenter demand effect. The effects of the explanatory variables in the other treatments, although they are aligned to the conventional wisdom to some degree, are not statistically significant at the 5% level of significance. Result 3 summarizes our findings.

**Result 3.** Some of individual heterogeneities, such as age, type of the house, education level, loss aversion, preparedness for retirement, intention to bequest, and demand for insurance help to explain their untreated intention to enroll in the home pension. However, most of them do not affect the positive change in intention as a response to the provided information in each treatment.

### 6 Concluding Remarks

Elderly poverty is one of the issues that need to be addressed immediately in the fastest aging country, South Korea. Our study is motivated by the fact that although there is a room for significant welfare enhancement among those who possess an illiquid asset—house—while whose income level is meager, surprisingly little proportion of eligible elderly enrolled in the home pension. In this study's sample, 32.8% of households headed by individuals aged 65 and older were found to be living in poverty (defined as having an equivalized disposable income below the poverty line).

We conduct an information provision survey experiment to examine how additional features or the change of the stereotypical beliefs about the home pension scheme would affect the intention to demand it. We report three sets of results. First, we found that the intention of enrollment increases by 6 percentage points when the home pension scheme is reformed to periodically redetermine the monthly pension payment based on the changes of the housing price and by 5 percentage points when it is reformed so that the remaining housing value can be bequeathed to their children more easily. A more interesting finding is that merely informing that the two major concerns—constant pension payment not responding to the recent changes in housing prices and bequeathing the remaining housing value—are contrasting each other also increases the intention of enrollment by 7 percentage points. These are not due to the experimenter demand effect of providing something (information) in the middle of the survey, as our placebo treatment does not lead to any significant changes. Our findings suggest that reconciling some concerns about the uptake of the home pension is as effective as the policy reforms that could have been considered most effective. We also find that while most respondents prefer the home pension over the reverse mortgages offered by private lenders, the reverse mortgages also have potential for growth if they offer competitive advantages such as house price-responsive payments, ease of inheritance, and additional incentives associated with medical care expenses and emergency withdrawals.

Lastly, we find that some individual heterogeneities, such as age, education level, loss aversion, and the level of financial literacy can help to explain their intention to enroll in the home pension, as well as the positive change in intention as a response to the provided information.

### References

- Brown, Jeffrey R., Arie Kapteyn, Erzo F. P. Luttmer, Olivia S. Mitchell, and Anya Samek, "Behavioral Impediments to Valuing Annuities: Complexity and Choice Bracketing," *The Review of Economics and Statistics*, 07 2021, *103* (3), 533–546.
- \_\_, Jeffrey R. Kling, Sendhil Mullainathan, and Marian V. Wrobel, "Why Don't People Insure Late-Life Consumption? A Framing Explanation of the Under-Annuitization Puzzle," American Economic Review, May 2008, 98 (2), 304–309.
- Choi, Kyung Jin, Byungkwon Lim, and Jaehwan Park, "Evaluation of the reverse mortgage option in Korea: a long straddle perspective," *International Journal of Financial Studies*, 2020, 8 (3), 55.
- \_\_, HeuiJu Chun, and Dong-Hwa Lee, "Determinants of Households' Intention to Take Out or Convert to a Trust-Type Home Pension: Evidence from South Korea," *Emerging Markets Finance and Trade*, 2023, 59 (5), 1538–1553.
- \_, Ingul Baek, and Dongho Kang, "초고령사회 대응 주택연금 활성화 방안 및 기대효과," Technical Report, 저출산고령사회위원회 2023.
- \_, Sanha Noh, and Ingul Baek, "Does home equity liquidation reduce older adults" poverty rate? Evidence from South Korea," *Journal of Poverty and Social Justice*, 2022, 30 (1), 59–76.
- Danz, David, Lise Vesterlund, and Alistair J. Wilson, "Belief Elicitation and Behavioral Incentive Compatibility," American Economic Review, September 2022, 112 (9), 2851– 2883.
- Davidoff, Thomas, Patrick Gerhard, and Thomas Post, "Reverse mortgages: What homeowners (don't) know and how it matters," *Journal of Economic Behavior & Organization*, 2017, 133, 151–171.
- de Quidt, Jonathan, Johannes Haushofer, and Christopher Roth, "Measuring and Bounding Experimenter Demand," *American Economic Review*, November 2018, *108* (11), 3266–3302.
- Fong, Joelle H, Olivia S Mitchell, and Benedict SK Koh, "Asset-rich and cash-poor: which older adults value reverse mortgages?," *Ageing & Society*, 2023, 43 (5), 1104–1121.

- Gächter, Simon, Eric J. Johnson, and Andreas Herrmann, "Individual-level loss aversion in riskless and risky choices," *Theory and Decision*, 2022, *92*, 599–624.
- Ha, Seura, Duk Gyoo Kim, Sang-Hyun Kim, and Euncheol Shin, "효과적인 퇴직연금 상품 운용을 유도하기 위한 행태 경제 실험 설계," *금융감독연구*, 2019, *6* (2), 79–141.
- Haaland, Ingar, Christopher Roth, and Johannes Wohlfart, "Designing Information Provision Experiments," *Journal of Economic Literature*, March 2023, *61* (1), 3–40.
- Han, Wei and Bo Zhang, "Analysis of the transformation of demand willingness for housing reverse mortgages in China based on a scenario simulation experiment," *Asian Economic Journal*, 2024.
- \_, \_, and Wei Li, "The constraining impact mechanism of financial cognitive ability on the effective demand for housing reverse mortgages in China," *International Review of Financial Analysis*, 2024, 95, 103531.
- Hanewald, Katja, Hazel Bateman, Hanming Fang, and Shang Wu, "Is there a demand for reverse mortgages in China? Evidence from two online surveys," *Journal of Economic Behavior & Organization*, 2020, 169, 19–37.
- Hossain, Tanjim and Ryo Okui, "The Binarized Scoring Rule," *The Review of Economic* Studies, 02 2013, 80 (3), 984–1001.
- Hwang, In Do, "Prospect theory and insurance demand: Empirical evidence on the role of loss aversion," *Journal of Behavioral and Experimental Economics*, 2021, 95, 101764.
- \_\_\_\_\_, "Behavioral aspects of household portfolio choice: Effects of loss aversion on life insurance uptake and savings," *International Review of Economics & Finance*, 2024, 89, 1029– 1053.
- \_\_\_\_\_, Yunmi Nam, Won Sung, Shim Seri, Jiin Yeom, Byongju Lee, Harim Lee, Jongwoo Chung, Tae Hyoung Cho, Young Jun Choi et al., "Lowest-low Fertility and Super-aged Society: Causes and Impacts of the Extreme Population Structure, and Policy Options," *Bank of Korea*, 2023.
- Kaplan, Greg, Giovanni L Violante, and Justin Weidner, "The Wealthy Hand-to-Mouth," Working Paper 20073, National Bureau of Economic Research April 2014.

- **Kwon, Ohik, Kyusik Kim, and In Do Hwang**, "한국의 화폐환상에 관한 연구 (Money Illusion: Evidence from Korea)," *Bank of Korea WP*, 2021, 8.
- Lee, Seunghee, "A Study on Elderly Poverty: Focusing on Income and Consumption," *KDI* Policy Study, 2023.
- Nakajima, Makoto and Irina A Telyukova, "Reverse mortgage loans: A quantitative analysis," *The Journal of Finance*, 2017, 72 (2), 911–950.
- Nardi, Mariacristina De, Eric French, John Bailey Jones, and Rory McGee, "Why Do Couples and Singles Save during Retirement? Household Heterogeneity and its Aggregate Implications," *Journal of Political Economy*, 2025, *133* (3), 750–792.

# **A** Appendices

### A.1 Additional Tables and Figures

| Population Info. Home Ov                                 |   | vnership Statistics (2022) by Statistics Korea  |                 |           |          |         |          |        |  |
|--|---|---|-----------------|-----------|----------|---------|----------|--------|--|
| Sampling Method Proportio                                |   | onal stratified sampling by gender, age, region |                 |           |          |         |          |        |  |
| (16 regions), and housing type (apartment, non-apartment |   |   |                 |           | tment)   |         |          |        |  |
| Tar  | get Populatio   | i) Adults                                       | aged 55 to 7    | '9 in Sou | uth Kore | a       |          |        |  |
|  |   | ii) Homeo                                       | owners or sp    | ouses of  | f homeov | wner    |          |        |  |
|  |   | iii) Not cu                                     | urrently enr    | olled in  | the hom  | e pensi | on scher | ne     |  |
|  | (as of 2022 home pension enrollment rate was only 1.16) |   |                 |           |          |         |          |        |  |
|  |   |   | Population      |           | Targeted |         | Sam      | pled   |  |
|  |   |   | Ń               | %         | N        | \$      | N        | -<br>% |  |
|  |   | Total   | 7,106,756       | 100%      | 3,800    | 100%    | 3,820    | 100%   |  |
|  |   | 55–59   | 1,925,760       | 27%       | 1,030    | 27%     | 1,049    | 27%    |  |
|  | Age   | 60–69   | 3,386,411       | 48%       | 1,811    | 48%     | 1,808    | 47%    |  |
|  | _   | 70–79   | 1,794,585       | 25%       | 959      | 25%     | 963      | 25%    |  |
|  |   | Male  | 3,704,815       | 52%       | 1,982    | 52%     | 1,996    | 52%    |  |
|  | Gender  | Female  | 3,401,942       | 48%       | 1,818    | 48%     | 1,824    | 48%    |  |
|  | Residence   | Apartment                                       | 4,407,975       | 62%       | 2,357    | 62%     | 2,411    | 63%    |  |
|  |   | Others  | 2,698,781       | 38%       | 1,443    | 38%     | 1,409    | 37%    |  |
|  |   | Seoul   | 1,242,011       | 17%       | 662      | 17%     | 673      | 18%    |  |
|  |   | Busan   | $526,\!310$     | 7%        | 283      | 7%      | 285      | 7%     |  |
|  |   | Daegu   | $345,\!045$     | 5%        | 185      | 5%      | 189      | 5%     |  |
|  |   | Incheon   | 386,157         | 5%        | 207      | 5%      | 213      | 6%     |  |
|  |   | Gwangju   | $193,\!435$     | 3%        | 103      | 3%      | 103      | 3%     |  |
|  |   | Daejeon   | 197,338         | 3%        | 104      | 3%      | 103      | 3%     |  |
| Deni   |   | Ulsan   | $166,\!247$     | 2%        | 89       | 2%      | 87       | 2%     |  |
|  | Parion  | Gyeonggi-do                                     | $1,\!651,\!634$ | 23%       | 883      | 23%     | 893      | 23%    |  |
|  | Region  | Gangwon-do                                      | $247,\!012$     | 3%        | 130      | 3%      | 130      | 3%     |  |
|  |   | Chungchukbuk-do                                 | $238,\!958$     | 3%        | 128      | 3%      | 127      | 3%     |  |
|  |   | Chungchungnam-do                                | 334,790         | 5%        | 179      | 5%      | 171      | 4%     |  |
|  |   | Jeollabuk-do                                    | $270,\!142$     | 4%        | 144      | 4%      | 145      | 4%     |  |
|  |   | Jeollanam-do                                    | 285,164         | 4%        | 153      | 4%      | 154      | 4%     |  |
|  |   | Gyeongsangbuk-do                                | 429,161         | 6%        | 230      | 6%      | 228      | 6%     |  |
|  |   | Gyeongsangnam-do                                | $505,\!291$     | 7%        | 273      | 7%      | 274      | 7%     |  |
|  |   | Jeju  | 88,065          | 1%        | 47       | 1%      | 45       | 1%     |  |

Table A.1: Representativeness of the surveyed sample

Notes: This table juxtaposes statistics for the South Korean population aged 55 or over and the targeted samples with those of the actual samples.

| Variable   | Responses  | G1        | G2        | G3        | G4        |
|--|--|-----------|-----------|-----------|-----------|
|  | High school or GED   | 420 (44%) | 395 (41%) | 406 (43%) | 407 (43%) |
|  | College  | 85 (9%)   | 115 (12%) | 92 (10%)  | 94 (10%)  |
| Education level  | Bachelor   | 323 (34%) | 352 (36%) | 363 (38%) | 348 (37%) |
|  | Postgraduate   | 120 (13%) | 104 (11%) | 93 (10%)  | 103 (11%) |
| $\chi^2$ -test statistic for homogeneity: 1.2318, <i>p</i> -value=0.9987 |  |           |           |           |           |
|  | Very unlikely  | 43 (5%)   | 41 (4%)   | 41 (4%)   | 37 (4%)   |
|  | Unlikely   | 259 (27%) | 276 (29%) | 275 (29%) | 251 (26%) |
| Intention to enroll  | Neutral  | 306 (32%) | 330 (34%) | 288 (30%) | 325 (34%) |
|  | Likely   | 325 (34%) | 304 (31%) | 337 (35%) | 326 (34%) |
|  | Highly likely  | 15 (2%)   | 15 (2%)   | 13 (1%)   | 13 (1%)   |
| $\chi^2$ -test statistic for homogeneity: 0.3931, <i>p</i> -value=0.941  |  |           |           |           |           |
| Uava anauga  | Yes  | 787 (83%) | 817 (85%) | 793 (83%) | 803 (84%) |
| mave spouse  | No   | 161 (17%) | 149 (15%) | 161 (17%) | 149 (16%) |
|  | $\chi^2$ -test statistic for homogeneity: 0.2021, <i>p</i> -value=0.9773 |           |           |           |           |

| Dependent variable: Intention to enroll in the home pension (before treatment) |                    |                |                 |                 |  |  |
|--|--------------------|----------------|-----------------|-----------------|--|--|
|  | (1)                | (2)            | (3)             | (4)             |  |  |
| Age  | -0.071***          | -0.0708***     | -0.0481***      | -0.046***       |  |  |
| 5  | (0.0054)           | (0.0055)       | (0.0059)        | (0.0063)        |  |  |
| Single-family house  | -0.2204***         | -0.2183***     | $-0.2431^{***}$ | $-0.2442^{***}$ |  |  |
|  | (0.0643)           | (0.0644)       | (0.0655)        | (0.0658)        |  |  |
| Female   | 0.0337             | 0.0357         | 0.1098          | 0.1167          |  |  |
|  | (0.0622)           | (0.0623)       | (0.0653)        | (0.0659)        |  |  |
| Education level  | $0.1878^{***}$     | $0.1854^{***}$ | 0.1805          | $0.1739^{***}$  |  |  |
|  | (0.029)            | (0.029)        | (0.0307)        | (0.0316)        |  |  |
| Negative national housing price expectation                                    | -0.0182<br>(0.072) |                |                 |                 |  |  |
| Negative local housing price expectation                                       |                    | -0.126         | -0.0712         | -0.0648         |  |  |
|  |                    | (0.0713)       | (0.0739)        | (0.0743)        |  |  |
| Risk aversion  |                    |                | -0.0312         | -0.0302         |  |  |
|  |                    |                | (0.0296)        | (0.0298)        |  |  |
| Patience   |                    |                | $0.062^{**}$    | $0.0627^{**}$   |  |  |
|  |                    |                | (0.0241)        | (0.0241)        |  |  |
| Loss aversion  |                    |                | $-0.1502^{***}$ | $-0.1475^{***}$ |  |  |
|  |                    |                | (0.0281)        | (0.0281)        |  |  |
| Married  |                    |                | 0.1399          | 0.1242          |  |  |
|  |                    |                | (0.0952)        | (0.0964)        |  |  |
| Have children  |                    |                | -0.2146         | -0.2373         |  |  |
|  |                    |                | (0.1581)        | (0.1593)        |  |  |
| Retire ready   |                    |                | -0.1794***      | -0.1791***      |  |  |
|  |                    |                | (0.037)         | (0.0503)        |  |  |
| Financial literacy   |                    |                | 0.0605          | 0.0627          |  |  |
|  |                    |                | (0.0461)        | (0.0463)        |  |  |
| Greater Seoul area   |                    |                | 0.1915**        | 0.1872**        |  |  |
|  |                    |                | (0.0623)        | (0.0648)        |  |  |
| Bequest intention  |                    |                | -0.6684         | -0.6683         |  |  |
| In automatic damand  |                    |                | (0.0001)        | (0.0000)        |  |  |
| insurance demand   |                    |                | 0.1000          | 0.103           |  |  |
| Solf ovelusted health lovel  |                    |                | (0.0251)        | 0.0232)         |  |  |
| Sen-evaluated health level   |                    |                |                 | (0.0347)        |  |  |
| Economic activities  |                    |                |                 | -0.0553         |  |  |
|  |                    |                |                 | (0.0793)        |  |  |
| Monthly income   |                    |                |                 | 0.0000          |  |  |
| Monomy meetine   |                    |                |                 | (0,0000)        |  |  |
| Income sufficiency   |                    |                |                 | 0.0326          |  |  |
|  |                    |                |                 | (0.0482)        |  |  |
| High house value   |                    |                |                 | 0.0182          |  |  |
|  |                    |                |                 | (0.1246)        |  |  |
| Net asset value  |                    |                |                 | 0.0000          |  |  |
|  |                    |                |                 | (0.0000)        |  |  |
|  |                    | 0000           | 0000            | 0000            |  |  |
| N<br>Drug I, DO  | 3820               | 3820           | 3820            | 3820            |  |  |
| Pseudo K2  | 0.0484             | 0.0487         | 0.0777          | 0.0782          |  |  |

#### Table A.3: Effects of individual characteristics on the intention to enroll

Notes: The numbers in parentheses are robust standard errors. \*,\*\*, and \*\*\* imply p < 0.05, p < 0.01, and p < 0.001. Ordered logit models are used. Control variables include age (55–79), dummy variables for single-family house and female, education level (1–5), a dummy for negative national/local housing price expectation, levels of risk aversion, patience, and loss aversion (1–4, respectively), dummies for marital status and children, readiness for retirement (0–4), level of financial literacy (0–2), dummies for residing in the greater Seoul area and intention of bequest, demand for insurance (1–4), health condition (1–5), a dummy for economic activity, average income (0–30,000), level of income sufficiency (1–5), a dummy for high house value, and net assets (–350,000–1,330,000).

## A.2 Questionnaire and Screenshots

(The translated survey questionnaire in English is available upon request.)